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The 11th National Transfusion Medicine Conference 2024: Breaking Barriers and Empowering Changes, held on 13th to 15th September 2024 in Kota Kinabalu, Sabah. Abstracts of paper (oral and poster) presentations as follows:

ABSTRACTS

CATEGORY: RESEARCH

BLOOD COMPONENT/PRODUCTS

1. Retrospective analysis of red blood cell transfusion requests and usage: insights from a new teaching hospital

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Introduction: Effective management of blood transfusion resources in hospitals is crucial. This study aimed to provide an overview of packed red cell transfusion requests, utilisation, and quality indicators at Hospital Universiti Putra Malaysia (HPUPM) from 2020-2022. Methods: This retrospective cross-sectional study analysed data from blood transfusion request forms. Descriptive statistics and quality indicators like crossmatched-transfusion ratio (CTR), non- usage probability (NUP), and transfusion probability were calculated. Results: From an analysis of 1035 transfusion request forms, it was found that 60% were for group screen and hold (GSH) and 40% were for group screen and crossmatch (GXM). Of the GSH requests, 18.7% were converted to crossmatch. The requests were evenly distributed by gender, with the majority (79.6%) from Malay with patients aged 25-64 years (58.1%). Notably, 65.5% of requests came from surgical departments. The overall CTR was 1.4, NUP was 30.1%, transfusion probability was 69.8%, and transfusion index was 1.8. Medical-based wards had a CTR of 1.2 and NUP of 0.2, whereas surgical-based wards had a higher CTR (1.7) and NUP (0.4). Discussion: The findings reveal a significant demand for blood transfusions, especially in surgical-based departments (65.5%), aligning with higher transfusion needs for surgical procedures. The overall CTR of 1.4 suggests a moderate level of blood utilisation efficiency, indicating room for improvement. Nevertheless, the higher CTR (1.7) and NUP (0.4) observed in surgical wards may be attributed to the unpredictable nature of surgical procedures and the need for readily available blood products. Conclusion: This analysis provides valuable insights into blood management practices at HPUPM, during early hospital establishment in 2020-2022. Continuous monitoring and evaluation are crucial to ensure judicious use of blood resources. Implementing evidence-based guidelines, enhancing communication between clinical teams and transfusion services, and further investigating factors influencing transfusion patterns could optimise blood utilisation and mitigate wastage in the future.

2. Evaluating temperature maintenance in pre- and post-implementation red blood cell shipments from the National Blood Centre Kuala Lumpur to various blood banks in the Northern Region and Sabah

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Introduction: Temperature management is essential during the shipment of blood products to ensure their quality and safety. Consequences of improper temperature control in red cells include reduced shelf life, compromised patient safety, and decreased efficacy. Objective: To evaluate the temperature maintenance of a small number of red blood cell (RBC) units during transportation from the NBCKL to various blood banks in the Northern Region and Sabah. Methods and material: A cross-sectional study was performed on 90 shipments of RBC packages comprising a quantity of one, two, or three units of RBC per box. Each shipment was sent from the NBCKL to various blood banks in the Northern Region and Sabah via POS LAJU courier by land and air. Each shipment box was equipped with a temperature data logger. The pre-implementation packaging method comprised 45 shipments packed with standard packaging and ballast packs. The post-implementation method comprised 45 shipments of standard packaging, ballast packs, and additional dummy water bags to ensure at least 6 units per box. Result: The pre-implementation approach showed that 26% of shipments with one unit per box could maintain the required temperature, whereas 13% and 33% of shipments with two or three units per box, respectively, could maintain the required temperature. The post-implementation method results revealed that 93.3% of shipments with one unit shipped per box could maintain the acceptable temperature, whereas 73.3% and 86.7% of shipments with two or three units shipped per box, respectively, could do so. Conclusion: The new packaging method with ballast packs and dummy water bags has significantly improved temperature maintenance during blood transportation. This study provides strong evidence for adopting the new packaging method to ensure the safety and quality of RBC units during transportation.

CELLULAR THERAPY

3. Leukapheresis collection experience for production of chimeric antigen receptor T-cell (CAR-T) for ongoing clinical trial relapsed or refractory aggressive diffuse large b-cell lymphoma (dlbcl) patients in University Malaya Medical Centre (UMMC)

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Introduction: Chimeric antigen receptor T-cell (CAR-T) therapy has emerged as a promising treatment for patients with diffuse large B-cell lymphoma (DLBCL). Leukapheresis, which is the first step in manufacturing CAR-T, is crucial to source good quality starting material for CAR-T production. Methodology: Transfusion medicine department of UMMC is involved in leukapheresis for a phase 1B/II CAR-T (Auxicart-19/22) clinical trial for patients with relapsed or refractory DLBCL. We report ten leukapheresis cases (n=10) performed using the Spectra Optia apheresis system with continuous mononuclear cell collection (cMNC) module via haemodialysis catheter. Patients were mobilised utilising granulocyte-colony stimulating factor (G-CSF) prior collection. Post-collection products were sent to an external laboratory. Results/Discussion: The median age of the patients is 63-years-old (34,69). Median pre-collection leukocyte counts of 16.5 $\times 10^9$ cells/L (3.6, 30.3). Despite mobilisation, two patients had a pre-collection leukocyte count of less than 10×10^9 cells/L. Post-apheresis collection's total live cells were more than 1000 million cells, achieving the CAR-T starting material standard, with mean percentage of 88.8% (SD: 0.04) for total lived cells viability, exceeding the >70% required specification. Mean percentage of CD4+CD19+ CAR-T was 45.9% (SD: 0.15), and the mean percentage of CD8+CD19+ CAR-T was 79.0% (SD: 0.07), both exceeding the CD19+ required specification. One patient required a repeated leukapheresis collection due to manufacturing failure, attributed to patient factors (pre-collection low leukocyte count) and clot presence in post-apheresis product. All products manufactured achieved the minimal cell dose (>2×10^6 cells/kg), with mean dose of 6.74 $\times 10^6$ cells/kg (SD: 1.95), median dose 6.79 (3.48, 9.58) 10^6 cells/kg. Conclusion: Proper coordination and good patient preparation are essential steps to a successful CAR-T leukapheresis, which provides excellent starting material for the manufacturing of quality CAR-T products.

CLINICAL TRANSFUSION

4. Assessing blood component transfusion and wastage rates in massive transfusion protocol (MTP) at a teaching hospital

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Introduction: MTP is designed for rapidly delivering large volumes of blood products in a predetermined ratio to patients who experience massive haemorrhage to improve their outcomes. Although some blood component wastage is to be expected, the acceptable amount of wastage remains unknown. The purpose of this study is to assess the blood component transfusion and wastage rate during MTP activation in Hospital USM. Wastage is defined as a blood component that was supplied after MTP activation but was not administered to the patient and was returned to the blood bank but was considered unsuitable for transfusion. Methods: A retrospective cross-sectional study was performed on 38 MTP patients in the year 2023. Data was extracted from the blood bank information system (MyTransfusi). Descriptive statistics was used for statistical analysis. A total of 863 blood products were supplied of which 265 (30.7%) were packed red blood cells (PRBC), 226 (26.2%) were fresh frozen plasma (FFP), 219 (25.4%) were cryoprecipitate and 153 (17.7%) were platelets. Results/Discussion: A total of 42 blood products were returned to the blood bank of which 36 (85.7%) were PRBCs, 6 (16.7%) were FFPs and none for platelet and cryoprecipitate. Among them, all PRBCs were accepted back to inventory but all FFPs were deemed not suitable and discarded. Thus, the wastage rate is 0.7% and 2.65% among all blood products and FFPs respectively. From this study, only a small portion of blood products are wasted. Conclusion: In conclusion, because there is no consensus on the blood component wastage rate during MTP activation, it is critical for the blood bank to monitor its wastage rate and analyse the MTP components that may influence the wastage rate. Since blood is a valuable resource, efforts should be taken to minimise waste as it can save costs and ensure that blood remains constantly available at all times.

5. Knowledge of Transfusion Medicine in Hospital Tuanku Ja'afar, Seremban

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Introduction: Medical officers need to have adequate transfusion medicine knowledge to ensure patient safety undergoing transfusion. A knowledge gap exists in this area. Strategies include integrating transfusion knowledge into medical curriculums, offering continuous CME, and promoting interdisciplinary collaboration to reduce the knowledge gap. Methods: Prospective cross-sectional studies. Convenient sampling questionnaires regarding knowledge of blood transfusion and knowledge of patient blood management among medical officers in Hospital Tuanku Ja'afar, Seremban. Results: There were 29 participants from various clinical

departments (Anaesthesiology, Accident and Emergency, Obstetrics and Gynaecology, Surgery, and Paediatrics) involved. The questionnaire consisted of 38 questions covering knowledge of transfusion medicine and patient blood management. The scoring system was categorized as low (less than 50%), moderate (50-75%), and high (more than 75%). For knowledge regarding blood transfusion, 8 participants (27.6%) scored at a moderate level, and 21 participants (72.4%) scored at a high level. Regarding patient blood management, 19 participants (65.5%) scored at a low level (less than 50%), 8 participants (27.6%) scored at a moderate level, and 2 participants (6.9%) scored at a high level. Discussion: This study highlights that medical officers often lack comprehensive knowledge. This knowledge gaps may lead to adverse patient outcomes, such as transfusion-related complications. Therefore, it is crucial for medical officers to address these gaps. Prioritising education and training on blood components, handling, and procedures can improve patient care, safety, and reduce risks and costs associated with transfusion practices. There is a significant knowledge gap among medical officers especially in patient blood management, requiring a multifaceted approach including integrating it into medical curricula, providing continuing education, and promoting collaboration.

6. Effect of donor, recipient, and component characteristics on haemoglobin increment following red blood cells transfusion among adult patients at Hospital Kuala Lumpur

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Introduction: The quality of red blood cells (RBCs) transfusions is known to be influenced by the inherent heterogeneity in the blood donor population, RBCs storage duration, and component modification. However, the effect of these factors on recipient outcomes remains uncertain. The primary aim of this study is to determine the impact of donor, recipient, and component characteristics on haemoglobin increment following RBCs transfusions. Methods: This retrospective cohort study involved 123 adult recipients admitted to the ward and who received a single unit of RBCs transfusion at Hospital Kuala Lumpur from 1st January 2020 to 31st December 2022. The association between donor, recipient, and component characteristics with haemoglobin increments was analysed using logistic regression. Results: A total of 97 recipients (78.9%) experienced a haemoglobin increment of more than 1g/dL after receiving a single unit of RBCs. Most of the recipients received RBCs from male donors (64.2%), regular donors (55.3%), and donors aged 17 to 44 years old (84.6%). Nearly half of the recipients had pre-transfusion haemoglobin levels of 7-8 g/dL (44.7%). Most recipients received RBC components without any modification (97.6%) and with an RBC storage duration between 1 to 21 days (65.9%). Lapsed donors, male recipients, and recipients with pre transfusion haemoglobin levels greater than 8 g/dL were associated with haemoglobin increments (p=0.007, p=0.015, p=0.017, respectively). Donors with lapsed donation status had 23.79 times the odds of regular donors for having a haemoglobin increment (OR=23.79, 95% CI = 2.42-234.27; p=0.007). Additionally, male recipients had 0.27 times the odds of female recipients for having a haemoglobin increment (OR=0.27, 95% CI = 0.09-0.79; p=0.015). Furthermore, recipients with pre transfusion haemoglobin levels greater than 8 g/dL had 0.11 times the odds of recipients with pre transfusion haemoglobin levels less than 7 g/dL for having a haemoglobin increment (OR=0.11, 95% CI = 0.02-0.67; p=0.017). Conclusion: Variations in donor and recipient characteristics have a direct effect on haemoglobin increments. Further analyses involving other donor and component characteristics are important to determine transfusion outcomes among recipients and to subsequently improve current transfusion practices.

7. An audit on blood ordering practice according to MSBOS guidelines in Hospital Sultan Abdul Halim

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Introduction: Maximum Surgical Blood Ordering Schedule (MSBOS) is a list of common elective surgical procedures performed, with the maximum number of blood units being crossmatched preoperatively for each procedure. It is important to eliminate unnecessary crossmatch and increase efficiency of blood usage resulting in effective inventory management, reducing costs and use of resources. Objective: This audit was done to determine the adherence of GSH/GXM request to standardise criteria (MSBOS) 2019 among clinical departments in HSAH and to formulate strategies to overcome non-adherence of GSH/GXM request. Material and Methods: Retrospective analyses of elective operative cases, done from February to April 2023 and from February to April 2024 were conducted. Total of 1652 elective operative cases from Surgical, Orthopaedic, Obstetrics and Gynaecology, Otolaryngology and Oromaxilofacial department screened and 1431 included. The data taken from two timeframe, to compare pre and post MSBOS update according to current procedure requirement which was implemented starting on November 2023. The type of blood order (GSH/GXM) and adherence to MSBOS were traced and analysed accordingly. Postponed cases, patients with antibody and Rh(D) negative were excluded. Result: About 42% of non-adherence to MSBOS was noted with major contribution from Orthopaedic department (52%) before MSBOS were updated and few strategies were implemented. It was a great accomplishment when only 13% of non-adherence to MSBOS was achieved, with more than 50% reduction when comparing the pre and post MSBOS update result. Discussion and Conclusion: Major demand of blood comes from elective surgeries and it goes beyond the real need. This affects blood bank where the main issue is unnecessary laboratory work and increase in CT ratio. Regular update of MSBOS helps to recognise modification or introduction of new surgical procedures, advances in surgical equipment and changes in transfusion criteria hence improving overall blood bank management.

8. Off label 3-Factor PCC usage in Hospital Serdang, is it beneficial or not?

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Introduction: Prothrombin complex concentrate (PCC) is increasingly utilised as a therapy in people who do not take oral anticoagulants as an "off-label" usage. Objective: To evaluate the effectiveness of off-label 3-factor PCC by looking at the effect in reducing INR and its clinical outcome. Materials Method: Retrospective study among non-overwarfarinised patients who received 3-factor PCC in Hospital Serdang from January 2022 to May 2023 using data from Lab Information System. Results: Among 94 patients who have received 3-factor PCC, 31 (32.9%) cases were prescribed as off-label in which the majority of 28 (90.3%) were administered as adjuvant therapy in major bleeding cases and 3 (9.6%) were non-bleeding cases. In major bleeding cases, administration of PCC only after at least one dosage of blood components transfused. Among major bleeding groups, cardiac surgery and postpartum haemorrhage were the most common indications which correspond to 8 (25.8%) respectively. Six (19.3%) cases were administered for gastrointestinal bleeding and followed by 3 (9.6%) cases for aortic bleeding. Two (6.4%) cases were prescribed for bleeding in trauma while only 1 (3.2%) case for brain surgery. In the non-bleeding group, coagulopathy is indicated for PCC for indwelling catheter insertion (2 cases) and acute liver failure (1 case). Data shown 17(54.8%) cases achieved the desired INR of 1.5 with an average dosage of 25iu/kg (12.5-50iu/kg). There was no thromboembolic adverse event reported and the survival rate following a 24-hour of PCC is 74% (23 out of 31). Conclusion: In this small series of patients, usage as "off-label" 3-factor PCC is beneficial in treating major bleeding cases and coagulopathy for surgical intervention by effectively reducing INR with no thromboembolic complications. This study provides enough significant results to plan a prospective study on the use of PCC for other than overwarfarinisation.

9. Impact of MSBOS and blood request screening implementation at Hospital Keningau

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Introduction: Maximum Surgical Blood Order Schedule (MSBOS) is a guideline that recommends a number of units of blood crossmatched according to specific surgical procedures. The objectives of MSBOS are to minimise the wastage of blood component resources, reduce the unnecessary workload and subsequently reduce the financial burden of reagents involved. Method: Data collections of blood requests and red blood cells used from 2023 and comparison with data collected during 2024 in their corresponding months. Discussion: Prior to 2024, all blood and blood components are requested by the clinician through a blood request form and any amounts of blood and blood components are granted without any screening by a medical officer of transfusion services. There are no specific guidelines on the number of bloods required for elective surgery. Hospital Keningau initially was a district hospital then started offering up to 17 specialties services to date hence the increase in transfusion demand. Without proper locally implemented guidelines, there will be cases of unnecessary transfusion or blood wastage. With the implementation of MSBOS and blood request screening started in January 2024, there has been a significant reduction in the number of blood requests and number of red blood cells utilised. The reduction in blood requests signifies only indicated blood requests are screened and crossmatched. The data collected during 2024 are compared with the previous year showing an improving crossmatch-transfusion ratio. The reductions of blood requests and red blood cells used may reduce the workload for medical laboratory technicians and subsequently reduce financial burden in the long term.

10. Uncrossmatched O Rh(D) positive blood transfusion: A Retrospective Analysis of Alloimmunisation.

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Introduction: The practice of uncrossmatched O Rh(D) positive packed cells transfusion, known as "Safe O," is integral to resuscitation efforts. Despite being generally safe, it carries risks like alloimmunisation and transfusion reactions. This study evaluates the indications and risk of alloimmunisation in patients receiving Safe O transfusions at HSNZ. Methodology: A retrospective study reviewed Safe O usage from January to December 2023. Data were gathered from Safe O return forms and cross-checked with the Blood Bank Information System (BBISv2). Patients' clinical histories were extracted from the Hospital Information System (HIS). Results: The study reviewed 208 cases involving 190 patients and 257 units of Safe O. Most cases (196, 94.2%) were indicated for Safe O transfusions. Among the patients, 62.6% received 1 unit, 35% received 2 units, and 2.3% received 3 units. Almost 99% received fully crossmatched Rh(D) compatible units, and 1% developed mild allergic reactions. A pretransfusion antibody screen (GSH) was negative in 97.1% of cases (202). Six cases (2.9%) had preexisting alloantibodies, including auto IgG with cold agglutinin, anti-Lea, anti-Mia, anti-D, anti-Jka, and anti-K. Approximately 50% of cases had a repeated GSH within 24 hours post-transfusion and no cases developed alloantibodies. Discussion and Conclusion: The study includes a diverse patient population. Although using O Rh(D) negative blood is ideal, it is not feasible locally due to the low prevalence (2.5%) of Rh D negative individuals in Malaysia. While the risk of acute haemolysis from isoagglutinin is mitigated, there remains a risk of alloimmunisation to non-ABO antigens and haemolysis from preexisting alloantibodies. The rate of incompatible transfusion was 1%, with no detectable post-transfusion alloantibodies. The benefits of Safe O transfusion outweigh the risks in emergencies

and should not be delayed for complete pretransfusion compatibility testing. Further studies are needed to evaluate the impact on clinical outcomes like mortality and morbidity.

11. Blood Group Type O: Collection and Usage in A State Hospital in Malaysia

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Introduction: Group O blood is known as universal blood since ABO blood group was known. Group O blood is used not only for group O patients but also for other blood group patients in emergency situations. Thus, strict control of Group O blood is crucial to prevent its depletion. In Malaysia, where RhD negative is not common, blood group O RhD positive packed cells are used as Safe O. Aim: This study aims to evaluate the collection of type O blood and usage as Safe O. Also to develop strategies to enhance the collection of type O blood and optimise the utilisation of Safe O in emergency settings. Methods: This retrospective study examines the collection and usage data of type O blood, especially Safe O, over a 12-month period from May 2023 to April 2024. Results: The findings indicate that over a 12-month study period, 12,528 units of blood Group O collected. Total of 732 units were used as Safe O. In terms of utilisation, it showed higher prevalence among males (256, 63%), Malay (206, 50%), and Emergency Department (258, 63%). Almost half (354,48.3%) of Safe O were requested for Non-O patients (Group A, B and AB). 3 units were transfused to RhD negative patients. Discussion & Conclusion: First strategy that can be done is to limit only one pint of Safe O in emergency situations followed by emergency cross-match with specific blood groups. Patients with known blood groups should be supplied with their own group specific blood. Patient blood management (PBM) methods including cell salvage, blood loss minimization during operation and transfusion alternatives such as intravenous iron should be applied. Lastly, mobile application and Artificial Intelligence (AI) should be widely used as tools for donor recruitment and retention. In conclusion, proper blood inventory management has to be enforced to ensure better clinical and donor care.

12. Implementation of iron clinic in Blood Bank Hospital Seri Manjung

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Introduction: Iron Clinic in Blood Bank Hospital Seri Manjung (HSM) was started in April 2021 where parenteral IV Iron (Iron Sucrose or Ferric Derisomaltose) was administered for patients referred from primary clinical departments as outpatient. Parenteral iron administration is an important part of first pillar in Patient Blood Management and indicated in Iron Deficiency Anaemia (IDA) when oral iron preparations are contraindicated or when there is a clinical need to deliver iron rapidly. Objective: To highlight the implementation of Iron Clinic in HSM. Methods: An observational descriptive study conducted retrospectively on referrals from primary clinical departments to Iron Clinic HSM since April 2021 to April 2024. Results: Between April 2021 to April 2024, there were 200 patients referred to Iron clinic where 42(21%) were pre-operative cases and 158(79%) were non-operative cases. There were 66 patients referred from surgical based departments such as orthopaedics, surgical and O&G to optimise haemoglobin prior to operation, 126 from medical department and 8 from other departments. Most referrals were IDA cases which had 144 (72%) cases followed by 25 (12.5%) malignancy cases,15 (7.5%) O&G cases and others about 16 (8%) cases. Majority patients were female about 148(74%) and 52(26%) were male. In term of race distribution, 117 were Malays, 52 were Indians and 31 were Chinese. Total of 158(79%) patients received IV Iron Sucrose and 42 (21%) received IV Ferric Derisomaltose. Only 4 patients had adverse events, 2 were fishbane reaction and 2 were mild allergy reaction. Discussion: To minimise the risk of blood transfusions, parenteral iron is recommended in clinically indicated anaemic patient. Administering intravenous iron as daycare procedure is beneficial for haemoglobin optimisation and improve patient outcomes by reducing hospital stay and also cost saving. However, intravenous iron still has small risk of adverse reactions. Conclusion: Implementation of Iron Clinic in Blood Bank HSM has good response and certainly proved to support medical and surgical based clinical departments to manage patient's anaemia.

13. A glance into the massive transfusion protocol for trauma patient at Hospital Sultan Ismail Johor Bahru

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Introduction: Massive and uncontrolled haemorrhage in the trauma patient is a life-threatening condition. Trauma was the fourth leading cause of death in Malaysia. The massive transfusion protocol (MTP) is designed to streamline the process and ensure early administration of blood components for effective resuscitation during a massive haemorrhage. The study regarding trauma patients and MTP in our country was limited. Objective: This study aims to determine demographics, clinical characteristics, laboratory investigations and outcomes of trauma patients that need activation of MTP. Method: This was a cross-sectional study involving data collection of trauma patients with MTP activation at Hospital Sultan Ismail Johor Bahru (HSIJB) from 1st June 2022 to 31st May 2024. Data were abstracted from the Total Hospital Information System (T.H.I.S). Data were analysed using SPSS, IBM version 29.0. Result: 71 trauma patients need activation of MTP during the period. The activation trigger of MTP was an Assessment of Blood Consumption (ABC) score of more than 2. The hospital mortality rate was 42.3%. The demographics were predominantly male (90.1%), Malay (49.3%), and blood group O (40.8%). The main cause of trauma was road traffic accidents (84.5%), followed

by falls (11.3%), industrial injury (2.8%), and assault (1.4%). The risks of mortality were Glasgow Coma Scale (GCS) level and haemoglobin level on arrival (P<0.05). The median length of ICU and hospital stay were 5 days and 12 days respectively. The risk of adverse transfusion reaction was 2.8%. Conclusion: Understanding the characteristics and risk of mortality among trauma cases admitted in our hospital is crucial for better management in the future.

14. Overnight adverse transfusion reaction in HSIS

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Introduction: Overnight transfusion (OT) is considered as transfusion between 8 pm to 8 am. Transfusion at night puts patients at risk as there is usually a lack of staff for managing and monitoring the transfusion. Types of transfusion reactions include febrile non-haemolytic transfusion reaction (FNHTR), acute and delayed haemolytic, transfusion-related acute lung injury (TRALI), transfusion-associated circulatory overload (TACO), mild to severe allergic, transfusion-associated sepsis (TAS), transfusion-associated dyspnoea (TAD) and non-specific transfusion reaction. Objective: To determine the incidence of overnight adverse transfusion reaction in HSIS. Methods: Retrospective study from total adverse transfusion reaction reported from January 2023 to December 2023 from Lab Information System. Results: A total of 62 adverse transfusion reactions were reported during the study period. Almost half of the reactions (28; 45.2 %) were OT. The most commonly reported are FNHTR (11; 39.3%), followed by mild allergic (5; 17.9%), and moderate allergic (4; 14.3%). Anaphylactic, TAD and non-specific reactions correspond to 2 cases (7.1%), respectively. One TACO and one case not related to transfusion. Indication of transfusion is categorised into anaemia (21; 75%), bleeding (6; 21.4%) and thrombocytopenia (1; 3.6%). Most adverse transfusion reaction cases occur following packed cell transfusion (26; 92.9%), with remaining (1; 3.6%) for fresh frozen plasma (FFP) and platelets, respectively. Conclusion: Adverse transfusion reactions that occur during OT are quite common. Thus, OT should be avoided wherever possible for cases without valid indications. Poor monitoring with a lack of staff gives a higher risk for patients during OT. For clinically indicated cases, it is advisable to initiate earlier transfusion at daytime rather than overnight. All hospitals should also establish guidelines for overnight transfusions.

15. An audit on blood ordering practice according to MSBOS guidelines in Hospital Sultan Abdul Halim

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Introduction: Maximum Surgical Blood Ordering Schedule (MSBOS) is a list of common elective surgical procedures performed, with the maximum number of blood units being crossmatched preoperatively for each procedure. It is important to eliminate unnecessary crossmatch and increase efficiency of blood usage resulting in effective inventory management, reducing costs and use of resources. Objective: This audit was done to determine the adherence of GSH/GXM request to standardise criteria (MSBOS) 2019 among clinical departments in HSAH and to formulate strategies to overcome non-adherence of GSH/GXM request. Material and Methods: Retrospective analyses of elective operative cases, done from February to April 2023 and from February to April 2024 were conducted. Total of 1652 elective operative cases from Surgical, Orthopaedic, Obstetrics and Gynaecology, Otolaryngology and Oromaxilofacial department screened and 1431 included. The data taken from two timeframe, to compare pre and post MSBOS update according to current procedure requirement which was implemented starting on November 2023. The type of blood order (GSH/GXM) and adherence to MSBOS were traced and analysed accordingly. Postponed cases, patients with antibody and Rh(D) negative were excluded. Result: About 42% of non-adherence to MSBOS was noted with major contribution from Orthopaedic department (52%) before MSBOS were updated and few strategies were implemented. It was a great accomplishment when only 13% of non-adherence to MSBOS was achieved, with more than 50% reduction when comparing the pre and post MSBOS update result. Discussion and Conclusion: Major demand of blood comes from elective surgeries and it goes beyond the real need. This affects blood bank where the main issue is unnecessary laboratory work and increase in CT ratio. Regular update of MSBOS helps to recognise modification or introduction of new surgical procedures, advances in surgical equipment and changes in transfusion criteria hence improving overall blood bank management.

16. 3-year retrospective analysis on cases of adverse transfusion reaction in Northern Major District Hospital

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Introduction: Blood transfusion has been one of the common procedures in hospitalised patient. Although blood transfusion can be a life-saving therapy, every transfusion carries a risk of adverse transfusion reaction. AIM: To determine the prevalence and to analyse adverse transfusion reaction cases among patients in Hospital Sultan Abdul Halim. Material and methods: All reported adverse transfusion reaction cases in 2021-2023 were evaluated using adverse transfusion reaction report. Data collection included age, sex, race, department involved, blood products associated with transfusion reaction and the type of transfusion reaction. Data were analysed using Microsoft Excel software. Results: Total of 34,120 of blood products were transfused. Out of this, 246 cases (0.72%) transfusion reactions were reported. The most frequent transfusion reactions were mild allergic reactions (58.9%)

followed by febrile non-haemoytic transfusion reaction (17.9%), unclassifiable complication of Transfusion (9.8%) and unlikely transfusion reaction (4.1%). Other causes contributed less than 1%. Majority were female (60.6%) compared to male (39.4%). Higher cases were seen in Malay (82.2%) followed by Indian (9.3%), Chinese (6.1%) and others (2.4%). Middle-aged adult group between 36 to 64 years old contributed most (46.3%) compared to others. Majority of cases occurred in Surgical and Obstretric and Gynaecology Department (23.6%) followed by Medical Department (20.3%). Higher occurrence of cases observed in packed red cell transfusion (73.6%) compared to Fresh Frozen Plasma (17.9%), Platelet (5.7%) and Whole blood (2.8%). Discussion & Conclusion: The prevalence of adverse transfusion reaction is 0.72% with mild allergic reaction is the most common type. Female, Malay, aged 36 to 64, with packed cell transfusion are common. Although the occurrence rate was relatively low, clinicians should be able to identify and report the adverse transfusion reactions occurred in transfused hospitalised patient to avoid under reporting of transfusion reaction cases.

17. An audit on near miss/transfusion error in Hospital Sultanah Bahiyah from 2022/2023

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Introduction: According to Malaysian Patient Safety Goal 2.0, Incorrect Blood/Component Transfused (IBCT) and near miss cases were aim to achieve standard of zero transfusion error. Both errors might cause severe complications to patients, especially in ABO blood group discrepancy. Aims/objectives: This study aims to determine the number of transfusion error (IBCT and near miss cases) in 2022 and 2023, to identify the underlying factors leading to transfusion error and to formulate strategies to reduce the number of transfusion error. Method: Retrospective study on number of IBCT and near miss cases in 2022 and 2023 after the implementation of the remedial at the end of 2022. The improvement introduced includes frequent continuous medical education (CME) sessions and orientation for house officers, and additional of patient's hospital registration number (AS number) as the third patient identifiers upon requesting blood or blood products. Result: Total transfusion error in HSB had reduced significantly from 27 cases in 2022 to 3 cases in 2023. 48% of error that happened in 2022 showed error from wrong name/IC on tube while 44% showed wrong blood in tube. The main factor contributing to the error is from failure to comply to positive patient identification. Conclusion: The two remedial actions introduced had reduced the number of transfusion error generally in 2023. However, additional measures and consistent efforts need be carried out to achieve standard of zero transfusion error.

18. External quality assessment in pre-transfusion testing

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Introduction: The implementation of external quality assessment (EQA) into the practice of blood transfusion laboratories is a crucial element of a comprehensive quality system for blood transfusion services. Quality assurance encompasses a comprehensive range of strategies and actions aimed at enhancing the operational efficiency and efficacy of the Blood Bank, ultimately leading to optimal advantages for both people and the broader community. Objective: To evaluate and analyse the performance of the external quality assurance programmes. Materials and Methods: A 1-year retrospective study from January 1, 2023, to December 31, 2023, was conducted at the Department of Transfusion Medicine, Hospital Queen Elizabeth II. A performance analysis form was used to collect and retrieve a performance summary. Test parameters include ABO and RhD blood grouping, direct antihuman globulin testing, antibody screening and identification, donor phenotyping, elution study, and compatibility testing. Results: Overall performance in the Royal College of Pathologists of Australia (RCPA) was excellent, with 100% achievement for six cycles in all test parameters. In the National External Quality Assessment in Blood Banking (NEQABB), cycles 1 and 3, the correct result interpretation was achieved as set by the Quality Assurance Programme Provider. In cycle 2, there was a penalty score for being unable to identify one antibody, with a total performance score of 94.55%. Discussions: Parameters in the programme reflect the actual technical work described in current blood transfusion practice. The implementation of the External Quality Assurance Programme yields substantial enhancements to transfusion service, encompassing the evaluation of performance, patient care, and safety concerns, as well as the staff competency and general quality of laboratory processes. Conclusion: Quality programmes could help blood banks and transfusion facilities report test results with greater dependability. Integrated with continuous quality controls, external source programmes enhance laboratory reliability of testing outcomes, ensuring patient and blood supply safety.

19. 'Zero tolerance' in pre-transfusion testing samples: Anticipating rejection criteria.

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Introduction: Pre-transfusion testing is a multistep process that includes positive patient identification, blood sampling, and laboratory testing. Specimen rejection during the pre-analytical phase could lead to delays in sample processing and patient management. Objective: To determine the rejection rate and possible causes of blood sample rejection. Materials and Methods: A

1-year retrospective study from January 1, 2023, to December 31, 2023, was conducted at the Department of Transfusion Medicine, Hospital Queen Elizabeth II. Rejection statistics were retrieved and analysed from the blood bank information system. Results: Out of the 9604 blood samples received, 167 (1.7%) specimens had been rejected. The most common cause of rejection was the blood sample lysed (124 samples; 74%), followed by the redundant test request (15 samples; 9%), the insufficient blood sample sent (10 samples; 6.0%), incomplete request form (8 samples; 5%), the test not indicated (4 samples; 2%), tube not labeled (2 samples; 1%), double label on the sample tube (2 samples; 1%), wrong identity card number (1 sample; 1%), and wrong request form (1 sample; 1%). The surgical department comprises 29.94% of rejected samples (167), followed by orthopaedics (23.95%), cardiology (19.76%), medical (11.38%), neurology medical (10.18%), cardiothoracic (2.99%), paediatric cardiology (0.60%), neurology medical (0.60%), and accident and emergency (0.60%). Discussions: The majority of preanalytical errors originate outside of the clinical laboratory, despite the fact that laboratory experts are the primary work force responsible for detecting these errors. Inappropriate blood sampling technique, handling, transportation, and documentation could lead to sample rejection. Mainly, a haemolysed sample may interfere with test interpretation since it might generate misleading hyperkaelemia and be misinterpreted as in vivo haemolysis. Conclusion: Education, continuous competency monitoring, and interdisciplinary collaboration between the laboratory and clinical departments through teaching and periodic assessment could potentially lower and maintain the rejection rate within an acceptable range.

20. Pre-operative patient blood management with intravenous iron isomaltoside

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Introduction: Pre-operative anaemia is a common comorbidity that often necessitates allogeneic blood transfusion, which correlates with a higher risk of morbidity and mortality. Pre-operative intravenous (IV) iron therapy has been proposed to tackle the first pillar of patient Blood Management to mitigate the risks associated with peri-operative blood transfusions. Methods: 17 pre-operative patients were referred from the Pre-Anaesthetic Clinic to the Iron Team following laboratory diagnosis of True or Functional Iron Deficiency anaemia (Hb < 10 g/dl). The diagnoses are based on FBC, Transferrin Saturation, Serum Ferritin and CRP combined. The dose of IV Iron Isomaltoside was calculated using the Ganzoni Formula based on a target Hb of 10 g/dl. However, the target Hb was increased to 13 g/dl for the subsequent cohort of patients. The Iron Team administered IV Iron Isomaltoside as an outpatient at the Blood Donation Centre. Each patient was followed up for Hb increment during admission for surgery, red cell transfusion, adverse event and FACIT assessment for fatigue level. Results: 76.5% of patients were colorectal patients. The remaining patients were Upper GI (11.8%), surgical (5.9%) and gynaecology patients (5.9%). The mean time from IV iron administration to surgery was 19 days (6 to 46 days). The mean Hb increment was 0.74 g/dl. The range of increment was -1.2 to 2.8 g/dl. This variability is probably due to time to surgery and whether the patient has ongoing overt or occult bleeding in the pre-operative phase. The mean number of units of packed cells transfused was 0.76 (0 to 3). No immediate and delayed adverse event post-IV Iron was reported. FACIT score improves post-IV iron administration. Conclusion: The efficacy of IV Monofer in pre-operative patients with iron deficiency anaemia was more evident with a longer time to surgery, no ongoing bleeding from underlying disorder and higher target Hb.

21. Stewardship of Patient Blood Management at Shah Alam Hospital

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Introduction: Patient Blood Management (PBM) programmes provide optimal stewardship of limited blood resources using evidence-based practice to optimise medical and surgical patient outcomes by a multi-professional, multimodal, and individualised approach that has shown benefits to organisations. Shah Alam Hospital (HSAS) is a hospital under the directive of Ministry of Health Malaysia was started in 2015 and is a secondary hospital with a capacity of 450 beds It is a district hospital with specialist services by providing secondary services including general medicine and related specialties, general surgery, Obstetrics & Gynaecology (OBGYN), Paediatrics and others. Anaemia, including iron deficiency anaemia (IDA), and iron deficiency without anaemia are affecting the lives of billions of many otherwise relatively healthy people. It is estimated 1.95–2.36 billion people have been affected by anaemia and 1.24–1.46 billion are iron deficient. In surgical related, preoperative anaemia rates can reach 75%. Anaemia management as part of PBM strategies had been in place at HSAS by clinical champions. Methods: Retrospective analysis of data pertaining on Patient Blood Management in HSAS from 2019-2023. Descriptive analysis was carried out from the gathered information. Results: Data gathered from full blood count (Hb <;12.5g/dL) for 2023 has shown 51% of registered patients were anaemic with mean haemoglobin (Hb) of 10.1g/dL. Patients who attended the clinic has higher haemoglobin (10.7 g/dL) compared to 9.6 g/dL of admitted patients. Furthermore, 646 (46%) out of 1859 full blood pictures (FBP) samples in 2023 were diagnosed with iron deficiency anaemia (IDA). Patients with IDA managed by general medical and OBGYN were treated either with oral iron or IV iron accordingly. There were increment in IV iron usage from 2019 to 2023. Erythropoietin was also prescribed for patient with chronic renal disease. Discussion: Implementation of PBM is practically and evidently provide better point of care and safety measures towards patient management. Expansion of PBM strategies for surgical cases (pre-, intra and post-operatively) would give greater impact on healthcare systems.

22. Quality Improvement: Targeted Massive Transfusion Protocol (T-MTP) in Reducing Blood and Blood Products Wastage During Massive Haemorrhage Management in Trauma Centre, Hospital Sungai Buloh

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Background: Massive transfusion protocols (MTPs) are structured regimens for administering blood and blood components to patients who are suffering from severe haemorrhage. MTPs vary across institutions. In our centre, the blood and blood products will be given in two consecutive cycles at a predefined ratio (1:1). Throughout therapeutic care, the proportions of

blood and blood components might change which leads to significant wastage of blood and blood components. Targeted Massive Transfusion Protocol (T-MTP) was developed by a collaborative effort involving trauma and transfusion team to manage the severe bleeding events without sacrificing the urgency of the blood supply supplied during MTP activation. The reduction of blood and blood product wastage during MTP activation was the goal of the newly introduced protocol. Methods: A retrospective review of the MTP and T-MTP activation records was conducted as part of an audit following the launch of T-MTP between 2022 until 2023. We gathered information on the quantity of MTP activation, blood products utilised, and wasted blood products. Results: There were nine T-MTP activations and four MTP activations in 2022, indicating that T-MTP activation was higher than MTP activation. There were four MTP activations and sixteen T-MTP activations in 2023. T-MTP activation increased in comparison to MTP activation. During T-MTP activation, blood product waste was 4.07% in 2022 and 3.19% in 2023; in contrast, during MTP activation, waste was greater (37.6% in 2022 and 53.1% in 2023). In comparison to MTP, practically all blood products are fully utilised in T-MTP. Conclusion: Overall, the use of alternative to MTP has been crucial in reducing blood wastage.

COVID

23. Did COVID-19 Vaccinated Donors Change the Landscape of Adverse Transfusion Reactions? Insights from a Retrospective Study (2019-2023)

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Introduction: The Malaysian Government launched the National COVID-19 Immunisation Programme (PICK) as a comprehensive national strategy to combat the spread of COVID-19. The first COVID-19 vaccine under this programme was administered in February 2021. With the rollout of these vaccines, concerns have arisen regarding the safety of blood donations from vaccinated individuals. This study examines adverse transfusion reactions (ATRs) reported to National Haemovigilance Coordinating Centre from 2019 to 2023 in Malaysia to determine if there is any correlation between the introduction of COVID-19 vaccines and an increase in ATRs. Methods: A retrospective review of ATRs data was conducted, focusing on various types of transfusion reactions reported annually from 2019 to 2023. The types of reactions analysed included Febrile Non-Haemolytic Transfusion Reactions (FNHTR), Mild, Moderate, and Severe Allergic Reactions, Transfusion Related Acute Lung Injury (TRALI), Transfusion Associated Circulatory Overload (TACO), Transfusion Associated Dyspnoea (TAD), and other complications. The total number of ATRs each year was also calculated. Results: The total ATRs recorded were 3985 in 2019, 3908 in 2020, 3382 in 2021, 3607 in 2022, and 4021 in 2023. Key findings include a notable increase in Mild Allergic Reactions in 2023 (1905) compared to previous years, and a consistent rise in Moderate Allergic Reactions from 106 in 2019 to 263 in 2023. FNHTRs showed a decreasing trend from 1482 in 2019 to 1081 in 2021, followed by minor fluctuations in subsequent years. Severe Allergic Reactions and TACO showed a general increase over the five-year period. No significant changes were observed in TRALI and TAD trends that correlate with the vaccine rollout period. Conclusion: The analysis does not indicate a direct correlation between the introduction of COVID-19 vaccines and a significant increase in ATRs. The observed trends in ATRs, such as the rise in allergic reactions and TACO, can be attributed to multiple factors, including changes in reporting practices and broader epidemiological variations. Current evidence and regulatory guidance suggest that blood from COVID-19 vaccinated donors is safe for transfusion. Continued monitoring and research are essential to ensure ongoing safety and address any emerging concerns.

DONOR AND BLOOD SUPPLY

24. Blood pressure and pulse rate changes following whole blood donation and their correlation with donor characteristics

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Introduction: Blood donation plays a pivotal role in maintaining a sustainable and safe blood supply for transfusion. Whole blood donation is associated with a 10.5 mL/kg of blood loss, which can result in changes in vital signs. This study aims to investigate the immediate changes in blood pressure (BP) and pulse rate (PR) following whole blood donation and the correlation between

these vital signs changes with donor characteristics. Methods: This cross-sectional study involved 51 whole blood donors who donated at the Transfusion Medicine Unit, Pusat Perubatan USM Bertam. Systolic BP (SBP) and diastolic BP (DBP) and PR were assessed before donation and 15 minutes post-donation (before donor refreshment). Donor characteristics, such as age, donation frequency, body mass index (BMI), and volume donated, were analysed using paired t-test and correlation test. Results: There are 31 (61%) male donors and 20 (39%) female donors with mean age of 36.6 years old and mean BMI of 27.4 kg/m^2. Most of the donors (37, 72%) had donated less than 5 times. A significant decrease in SBP, DBP, and PR was observed before and 15 minutes post-donation (p=0.001, p=0.001, and p=0.044, respectively). The mean SBP, DBP, and PR decreased from pre-donation were 5.2 mmHg, 4.8 mmHg, and 2.3 beats/minute, respectively. A significant negative correlation was found between donation frequency and volume donated with PR changes (r=-0.345 and r=-0.310, respectively). No significant correlation was observed between the donor characteristics with BP changes. Conclusion: This study found a significant decrease in BP and PR following whole blood donation and a moderate negative correlation between donation frequency and volume donated with PR changes. Therefore, understanding the impact of blood donation on donor health is crucial in safeguarding the donor's safety and maintaining the blood bank inventory.

25. Analysis of phenotyping and genotyping among Jk3 donors in Miri

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Introduction: The Kidd (Jk) blood group system comprises three antigens: Jka, Jkb, and Jk3. These antigens are present in most individuals, except those with Jk (a-b-) or Jk null phenotype. Objective: To analyse the red blood cell (RBC) phenotyping and genotyping among Jk null donors in Miri Hospital. Method: This is a cross-sectional study performed among blood donors over a 2-year period. Donors were screened using urea lysis test, followed by confirmation of Jk3 phenotype using gel card method. Results: A total of 12 out of 19,512 blood donors tested negative for the urea lysis test from May 2022 to May 2024. 6 were Malay, 2 were Iban, and 1 each was from Kayan, Kedayan, Melanau and Murut ethnic groups. The donors' ages ranged from 23 to 56 years old. Most of them were first-time donors except for one case. All were phenotyped as Jk (a-b-) but none of them had anti-Jk3 antibodies detected. Out of eight follow-up cases, three of them had RBC genotyping done at National Blood Centre that showed the presence of Jkb allele, yet no Jkb antigen was detected serologically. Discussion: The urea lysis test is an important screening test to detect the Jk null phenotype. Jk (a-b-) individuals have an absence of urea transporters on erythrocytes, hence they are resistant to lysis on 2M urea. We found a discrepancy between phenotyping and genotyping of the Jk null donors. Mutations can cause antigens with weak or modified expression profiles. Only donors with the Jk3 phenotype can transfuse blood to Jk (a-b-) recipients to prevent the incidence of producing antibodies against the Kidd antigens. Conclusion: The detection of Jk (a-b-) donors is crucial due to the scarcity of the source. In some individuals, genotype does not reflect phenotype. Nevertheless, they still need to be managed as a rare Jk3 donor.

26. Pattern of deferred donors resuming back donation: National Blood Center's Perspective

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Introduction: Temporary blood donor deferrals are major obstacle in maintaining stability of blood supply in our healthcare system. In order to maximise donor retention, this study explores the effects of temporary deferrals (TD) on donor return rates at the NBC. Exploring, identifying types of deferrals and its related risk factors is probably a lead direction to wider understanding. Objective: Determine donor return rate based on existing donor pool's categories (new, regular, lapse), type of temporary deferrals in association to donor's age and gender. Methods: A retrospective analysis of TD donors at NBC; data obtained from Blood Bank Information System version 2.0 from July to September 2023 and October to December 2023 for subsequent donor returns. Results: 4,850 returned donors following TD were studied. In which 68% return rates were those age over 60, followed by 40-49 (24.2%) and 50-59 (20.1%). Whereas donors under 20 were lowest 6.7%. Older donors had greater return rates. Comparison among gender males flagged 8.7% and women 6.7%. Furthermore, regular donors contributed higher return rate 38% compared to lapsed 6.8% and new donors 6.9%. Type deferrals had a comparable effect on return rates. A higher probability of return rate was indicated by donors with abnormal haemoglobin levels (57.6%) and dental treatment (50%) compared to other temporary deferrals. Discussion: Reflecting the outcome of this study, it is clear certain group of donors are prone to return. Thus, to improve the delay of return each information has to be explored further. Knowledge on how donor type, age, and gender affect return rates after temporary deferrals carves a path for mitigation of repeated deferral. Conclusion: Various aspect of deferrals impacts each donor differently. It's crucial to educate donors in accordance to individual needs. As way forward targeted strategies to enhance donor return rates is not optional. As ageing donor population in order to achieve balanced and sustainable blood donor pool constant development is necessary.

27. Prevalence of del phenotype among serologically D-negative blood donors: A Study at Hospital Sultanah Nur Zahirah

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Introduction: A “D-negative” blood donor may exhibit a DEL phenotype, characterized by the presence of the D antigen detectable only through adsorption and elution of anti-D, when conventional tests are negative. Evidence suggests low risk of anti-D alloimmunisation in Asian-type DEL. Objectives: This study aimed to determine the prevalence of the DEL phenotype among serologically D-negative blood donors at Hospital Sultanah Nur Zahirah (HSNZ). Methods: A retrospective cross-sectional study was conducted on all serologically D-negative blood donors from 2002. Twenty-eight out of 241 serologically D-negative samples were tested for the DEL phenotype using the adsorption-elution test. Data were extracted from the Blood Bank Information System (BBIS) and analysed using Google Sheets. Results: Initial RhCE typing of blood donors at HSNZ showed that 143 out of 241 (59%) were C- and E-. Approximately 86 (35%) were C+ and the remaining 12 (4.9%) were E+. Among the 86 C+ samples, 22 were tested for DEL, with 19 testing positive. Meanwhile, 5 out of 6 E+ samples tested were DEL-positive. Discussion and Conclusion: Currently, more than 44 DEL alleles are recognised by the International Standard of Blood Transfusion (ISBT). In East and Southeast Asia, over 99% of the population is RhD-positive (D+). Among serologically D-negative individuals, 10-30% are reported to be Asian-type DEL. RhCE phenotyping is practical as an initial screening method, particularly as C+ blood donors (e.g., r’r) are more likely to have the DEL phenotype. This approach reduces the number of serologically D-negative samples requiring adsorption-elution testing. However, RHD genotyping is more accurate, despite comparable costs. Future prospects include molecular confirmation of DEL among RhD-negative blood donors and patients, potentially allowing transfusion of RhD-positive red cells and termination of anti-D prophylaxis in those with Asian-type DEL.

28. Blood donor deferral – A Centre-Based Study in Tertiary Care

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Background & Aim: Blood donor selection is an important part for the safety of donors and ensuring the quality and safety of the blood products. To facilitate donor management strategies and mitigate deferral rates at Hospital Raja Perempuan Bainun, Ipoh (HRPB), this study was aiming to identify the reasons behind deferrals among blood donors, particularly focusing on the incidence of low haemoglobin deferrals. Materials & method: This was a retrospective, single centre-based study carried out in Transfusion Medicine Department at HRPB. The study includes donations at bleeding suite in centre and donations from mobile sites organised by HRPB. The data for blood donors in 2023 from 1st January to 31st December (12 months) was retrieved from Blood Bank Information System Version 2 (BBIS v2) and deferred donors records. Results: A total of 35 250 donors came for blood donation in 2023, among them 12.69% (n: 4472) were deferred due to various causes. About 95.95% were deferred temporarily. Main cause for deferral was low haemoglobin (n: 2152, 48.12%), followed by high blood pressure (n: 389, 8.70%) and sleep less than 5 hours (n: 303, 6.78%). For low haemoglobin deferrals, females predominant (n: 1641, 76.25%) and more than half were regular donors (n: 1229, 57.11%). Conclusion: Majority of the deferral were temporary and preventable. Higher rates of deferral due to low haemoglobin, especially among regular donors alert us the potential for them to become iron deficiency and subsequently may reduce donation collection. Proactive and preventive measures especially among female donors as well as regular donors should be taken to ensure donor retention and return of temporarily deferred donors.

29. Frequencies of clinically significant red cell phenotypes among blood donors in Perak: Improving blood donor recruitment and retention

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Introduction: Red cell phenotypes refer to the specific characteristics of red blood cells (RBCs) that are determined by the expression of various antigens on their surface, genetically inherited and important in blood transfusions and organ transplants. There are 354 red cell antigens in 44 blood group systems according to the International Society of Blood Transfusion (ISBT) in 2022. Malaysia is multiracial country and hence the different frequency of significant red cell phenotypes among ethnic groups is seen in new, lapsed and regular donors. Objective: This study aims to identify the frequency of significant red cell phenotype among blood donors in Perak to strengthen the strategy of recruitment and retention of the donors. Method: This is a cross-sectional study and includes donors from all 14 hospitals involved in blood donation drives in Perak during the study period from January 2020 to December 2022. Medical Laboratory Technologists (MLTs) and Science Officers (SO) will record the result of the phenotype into the Blood Bank Information System (BBIS). This study includes all recorded donors with significant red cell phenotype (ABO, Rhesus, Rhesus(D), Kidd, Kell, Duffy, and MNS) that were tested randomly on 377 blood donors. Results: The frequencies of the ABO blood group are highest in blood group O (53.3%), followed by B (19.6%), A (17.8%), and AB (9.3%). 12.5% of donors were

Rh(D) negative, higher than the percentage for the Malaysian population. The most common phenotype is R1R1 (36.3%), followed by R1r (18.3%) and R1R2 (13%). Jka-b- phenotype was rare, only two donors: one Malay (0.8%) and one Indian (1.5%) identified. 75.9% of donors have Fya+b- phenotype with the highest prevalence seen among Chinese donors (89.9%). Fya-b+ phenotype was frequently found in Indian donors (31.3%) and not seen among Chinese donors. Conclusion: Understanding frequency of clinically significant red cell phenotypes would bring better insight for a strategic approach for Blood Transfusion Services (BTS) in Malaysia to recruit and retain blood donors.

30. Analysis of repeatedly low HB deferral among repeat donors and impacts on donor return behaviour in Melaka

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Introduction: Low haemoglobin (Hb) among blood donors is a common cause of donor deferral in blood donation services especially among repeat donors. It affects both the blood donor and blood donation service in terms of time and resources. This study aimed to identify at-risk donors and to analyse the demographics of repeat donors with repeatedly low Hb deferral. Materials And Methods: It was a retrospective study of 1-year duration from January to December 2023. The data of the repeat donors who were repeatedly deferred for low Hb were recorded on a separate proforma which included the demographic details (age, gender) and donation details before repeated low Hb deferral (the total number of donations, the number of donations in the last 12 months, and whether the donor returned for a subsequent donation) were collected. Results: A total of 28663 donors donated and 276 donors with repeatedly low Hb deferral were included. A higher rate of repeatedly low Hb deferral was recorded among female donors 0.8% (220/28663), while 0.2% were male donors. Female repeat donors aged 21-30 years old are more likely to experience repeated low Hb deferral. A higher rate was observed in donors with fewer total donations (71.4%) and less frequent donations in the last 12 months (89.5%). After repeatedly low Hb deferral, the overall return rate for subsequent donations was (173/276) 62.7%. Conclusions: Female donors were at a higher risk of repeatedly low Hb deferral, particularly between the ages of 21 and 30. It is imperative to identify at-risk donors and implement preventive measures into place, such as donor education and awareness on anaemia prevention, iron supplementation, and appropriate interval donation; to minimise low Hb among blood donors as well as to enhance donor recruitment and retention programme.

31. Safeguarding blood donor screening: Comparing haemoglobinometer and automated analyser for haemoglobin estimation

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Introduction: Screening blood donor haemoglobin (Hb) levels before donation is essential to prevent anaemia among donors and ensure high-quality blood products. Portable haemoglobinometer facilitates rapid Hb testing in donation settings. Objective: This study aimed to assess the accuracy of haemoglobinometer compared to automated haematology analyser. The goal was to demonstrate that current haemoglobinometer can reliably perform Hb testing for blood donors. Material and Methods: Thirty blood samples analysed with SYSMEX XN1000 (Symex, Japan) were tested with Konsung H7-3 (Jiangsu Konsung Bio-medical S&T, China) and CompoLab TM (Fresenius Kabi, Germany) haemoglobinometers within four hours. Pearson's correlation and Bland-Altman agreement methods were used to evaluate their accuracy. Result: Konsung H7-3 recorded higher mean Hb values (13.57 ± 2.19 g/dL) than SYSMEX XN1000 (13.50 ± 2.22 g/dL), while CompoLab TM measured lower values (13.36 ± 2.36 g/dL). Both devices correlated strongly with the reference (Konsung H7-3: r = 0.9922, CompoLab TM: r = 0.9924) and showed good agreement on Bland-Altman plots. The mean bias was +0.02 g/Dl (0.31) for Konsung H7-3 and -0.24 g/dL (0.32) for CompoLab TM. Sensitivity was 100% for Konsung H7-3 and 93.8% for CompoLab TM. Both devices demonstrating 92.9% specificity. Konsung H7-3's positive predictive value (PPV) was 94.1%, and negative predictive value (NPV) was 100%, compared to CompoLab TM's PPV of 93.8% and NPV of 92.9%. Discussion: Pre-donation Hb estimation is a critical point in donation screening. Male donors require Hb levels of 13.5–18.0 g/dL, while females need 12.5–18.0 g/dL to be eligible. Reliable haemoglobinometer is crucial in distinguishing eligible from ineligible donors, thereby minimising unnecessary deferrals during persistent blood shortages This procedure also effectively prevents donor anaemia, as donors' Hb levels typically decrease by 1–1.5 g/dL post-donation. Conclusion: Both haemoglobinometers demonstrate high sensitivity, specificity, and accuracy, hence confirming their reliability for Hb testing in blood donors.

32. Rare phenotype blood donors among the multi-ethnic population in Sabah

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Introduction: Rare phenotype blood donors are individuals who possess blood types or specific antigen profiles that are uncommon within the general population. These donors are crucial in transfusion services because their blood may be needed to match patients with rare blood types or specific antigen profiles, especially in cases of repeated transfusions or when patients have developed antibodies to common blood antigens. Objective: To analyse the total number of moderate and extremely rare phenotypes among

blood donors. Materials and Methods: A 5-year retrospective study from January 1, 2019, to December 31, 2023, was conducted at the Department of Transfusion Medicine, Hospital Queen Elizabeth II. Total blood collection and total moderate- and extreme-rare phenotype blood donors were retrieved and analysed from the blood bank information system. Results: The total number of blood donors was 348,388. Under the moderately rare phenotype, SS was the rarest with 10 blood donors, followed by R2R2 with 28 blood donors, Fy (a-b+) with 33 blood donors, Rh-negative (cde/cde) with 50 blood donors, and NN with 86 blood donors. The extremely rare phenotype in Sabah was Fy (a-b-), with 1 blood donor, followed by KK with 2 blood donors, and Jk (a-b-) with 71 blood donors. Discussions: Sabah has a diverse population with varying genetic backgrounds. In such populations, rare blood phenotypes are less likely to occur naturally compared to more homogenous populations. Establishing and maintaining registries of individuals with rare blood types to facilitate quicker identification and recruitment during emergencies could be the best strategy to address the challenges. Conclusion: Identifying and recruiting rare-phenotype blood donors can be challenging due to their low frequency in the population. Blood centres and transfusion services may conduct educational campaigns, use advanced testing technologies, and collaborate with other centres to expand their pool of rare donors.

33. Molecular diagnostics: Enhancing transfusion safety

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Introduction: Nucleic Acid Testing (NAT) is a highly sensitive method used in blood donor screening to target specific viral genetic material (RNA or DNA) of the pathogens known to cause transfusion-transmitted infections (TTIs), such as hepatitis B virus (HBV), hepatitis C virus (HCV), and human immunodeficiency virus (HIV). NAT is particularly important for detecting infections during the window period - the time between when a person becomes infected and when the infection can be detected by serology methods. Objective: To analyse the window period detection of nucleic acid testing and concordant results with serology screening. Materials and Methods: A 2-year retrospective study from January 1, 2022, to December 31, 2023, was conducted at the Department of Transfusion Medicine, Hospital Queen Elizabeth II. Total blood collection was screened, and data related to blood screening results were retrieved and analysed from the blood bank information system. Results: Out of the 149,840 blood donors, 581 donation screening results were concordant between serology and NAT testing and 52 donations were window-period donations. Concordant HIV results were 49 (8%), followed by HCV with 50 (9%) and HBV with 482 (83%). Window period donation statistics were one (2%) HIV, followed by one (2%) HCV, and 50 (96%) HBV. Discussions: Nucleic acid testing in blood donor screening serves an important role in preventing TTIs by detecting viral infections early in the donation process. Among the TTIs, HBV exhibited the highest overall prevalence for window period donation, followed by HCV and HIV. Concordant results between serology and NAT provide a high level of confidence in the accuracy of donor screening for TTIs. Conclusion: The implementation of nucleic acid testing has significantly reduced the risk of TTIs from blood transfusions, besides improving the safety and reliability of blood transfusions and ensuring that donated blood products are safe for recipients.

34. EH! WHY CANNOT DONATE? - Analysis of blood donor deferral in a tertiary care hospital in 2023

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Introduction: Safe blood donors are the epitome of safe blood transfusion services. Donor criteria are a vital aspect of blood safety intended to ensure the selection of healthy donors and prevent recipients from harm. Blood donors may be deferred for an array of reasons, either permanently or temporarily. Consequently, it's critical to examine the deferral pattern, eliminate needless deferrals, and promote blood donation. Objective: To analyse the pattern of whole blood donor deferrals in Hospital Seri Manjung (HSM), Perak. Material & Method: An observational retrospective study was conducted from January 2023 - December 2023 in HSM. The donor deferral pattern was extracted from Blood bank Information System Version 2 (BBISv2). All donor deferrals within this period were included from the centre and mobile donations. Results: A total of 7082 non-remunerated donors came forward for blood donation of which only 5284 (74.6%) successfully donated while 1798 (25.3%) were deferred. In our study, we observed that temporary deferrals 1722 (95.8%) were more common than permanent deferrals 76 (4.2%), aligning with previous global studies. The top five causes of temporary deferral were low haemoglobin 836 (46.5%), high blood pressure 186 (10.3%), upper respiratory tract infection 116 (6.5%), followed by being on medication 90 (5.0%) and low blood pressure 50 (2.8%). Permanent deferrals were due to chronic diseases and infectious disease involvement. Conclusion: Generally, most donors were deferred due to modifiable causes such as anaemia. A deferred donor is likely to experience feelings of disappointment, dissatisfaction and to perceive the impression that the donation process is difficult. Regardless of donor deferral reason, the potential donor and blood bank staff face disappointment. Thus, minimising temporary deferrals requires transparent communication with deferred donors about the reasons for their short-term deferral. Encouragement should be provided to prompt their return and donation after the specified deferral time to maintain the blood pool.

35. Blood grouping and Rh Phenotyping among blood donors in Perak Selatan Territory

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Introduction: A blood bank's primary role is to ensure that patients receive safe and compatible blood and blood components. Apart from ABO, the Rhesus (Rh) blood type system is the major blood group system. A number of distinct Rh antigens have been identified, but RhD is the first and most specific antigen used, triggering the most extreme immune reaction. Knowing donor's blood group and phenotype may help to reduce alloimmunisation for patients. Objective: To evaluate the ABO grouping and Rhesus Phenotyping among blood donors in Perak Selatan territory. Method: This descriptive study was done within 5 months from December 2020 until April 2021. Results: O Positive blood group was found in 43% of the 100 donors, 30% are B positive, followed by A positive and AB positive. Results showed that 57% of the blood donors is R1R1 phenotype. 25% is R1R2, 9% is R1r, 4% is R2R2, 3% is R1Rz and 1% is R2r and R0r. The data were also crosstabulated with the donor's race and found that R1R1 is the most common among all races. Discussion: The distribution of ABO Grouping and Rh Phenotype may be affected by many factors, such as genetics, race, ethnicity, marriage, demographics, and migration. If the blood transfusion centre has a donor blood database of blood grouping with Rh Phenotyping results, it will be easier to supply patients the specific blood as it will help to reduce alloimmunisation. Conclusion: The need for blood and blood products is growing, as well as the advancements in transfusion medicine. Also, knowing how common red cell antigen phenotypes are in people of different ethnic backgrounds can help in making a donor database and possible to make native cell panels and facilities for rare donor units.

OTHERS

36. Determine the alloantibody profile of Queen Elizabeth Hospital (QEH) patients from 2017 to 2019

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Introduction: Red blood cell alloimmunisation is one of the most common complications among blood transfusion recipients. This study was conducted to determine the alloantibody profile of Queen Elizabeth Hospital (QEH) patients from 2017 to 2019. Was cross-sectional descriptive and used retrospective data from 2017-2019. Material & Methods: Sample collection was by Purposive and Convenience sampling method in which all alloantibody positive patients (188 people) from all patients aged (37,552 people) from 2017 to 2019 were included in this study. Data is accessed from a patient information management system, Darah Link, QEH. In the demographic distribution, the study found no significant difference in the percentage of alloantibody types between female (n = 111; 59%) and male (n = 77; 41%) patients with p values > 0.05 ($x2 = 3.994$, $p=0.407$). Results & Discussion: The most common alloantibodies found in the population were Rh antibodies which were 130 cases (69.15%), followed by Kidd antibodies in 23 cases (12.23%), Duffy antibodies in 7 cases (3.72%), Kell antibodies in 2 cases (1.06%) and other antibodies (Lewis, MNS and anti-Mia) in 26 cases (13.83%). Transfusion Dependent Patients (TDP) produced the most alloantibodies at 158 people (84.0%) compared to Non-Transfusion Dependent Patients (NTDP) at 30 people (16.0%). The study found that there was a significant difference in the percentage of antibody types between TDP and NTDP patients with p-value < 0.05 ($x2 = 16.051$, $p = 0.003$). The high frequency of TDP patients is because blood transfusion is the main treatment and is a lifelong treatment for these patients. Conclusion: Based on the findings of the study, it is hoped to benefit the Transfusion Medicine Unit, QEH in supplying safe and specific blood to patients as well as limiting the income of alloimmunisation among patients treated.

37. Evaluating the feasibility of implementing an antibody identification service in a new blood bank

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Introduction: Establishing red cells antibody identification service in a newly operated blood bank requires careful consideration, particularly when the distance to a referral laboratory is significant, and there is an urgent need for packed cells. This study aims to evaluate the necessity of setting up an antibody identification service in our Transfusion Medicine Unit, Department of Clinical Diagnostic Laboratories, Hospital Al Sultan Abdullah Universiti Teknologi MARA. Methods: Antibody screening-positive cases in 2023 requiring antibody identification were selected for analysis. Laboratory investigations conducted by the referral laboratory (Pusat Darah Negara - PDN) were compiled and analysed. Results and Discussions: Out of 6,753 antibody screening tests that were performed in 2023, 97 cases (1.4%) were positive and referred to PDN for antibody identification. Of these, 8(8.2%) were found to be false positive (no alloantibody detected). The remaining 89 cases (91.8%) included 44 negative Direct Coombs' Test (DCT) and 45 positive DCT. In the negative DCT group, there were 34 single antibody cases and 10 multiple antibody cases. Positive DCT cases underwent further investigations, including elution, revealing 7 cases with a mixture of allo- and auto-antibodies, 21 cases with single alloantibodies, 7 cases with multiple alloantibodies and 10 cases with autoantibodies. Among all the positive antibody cases, 49 cases (50.5%) were non-clinically significant, and 44 cases (45.4%) were clinically significant antibodies.

The high percentage of positive antibody cases in our centre that required extended techniques underscores the importance of accurate antibody identification and appropriate management. This trend indicates the necessity of ensuring an adequate number of well-trained staffs, sufficient reagent supplies and a robust blood inventory. Performing basic antibody identification is not recommended due to the likelihood of requiring repetitive blood sampling for further investigations. Conclusion: Establishing an antibody identification service at this stage may not be the most prudent decision at this time. The low prevalence of positive cases and the need for advanced techniques and resources further support this conclusion.

38. An audit on the pre-analytical errors of massive transfusion protocol in Hospital Sultanah Bahiyah (HSB) from 2023 to 2024.

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Introduction: Massive transfusion protocol (MTP) is activated by clinician in response to massive haemorrhage. MTP has a predefined ratio of RBCs, FFP, cryoprecipitate and platelet units (e.g. 1:1:1:1) that are issued out in a package for transfusion. There were 24 cases of MTP activation in HSB from January to September 2023. Out of those cases, 14 cases (58%) are identified to have pre-analytical errors. To address the shortfall, in October 2023, the Transfusion Medicine Department introduced the MTP Bundle Kit, a pre-packed bundle with the required number of blood request forms, number and type of blood specimen tubes for each MTP package. This clinical audit objective is to determine the percentage of pre-analytical errors before the introduction of MTP Bundle kit and to identify types of pre-analytical errors. Method: A retrospective study was conducted by obtaining data from MTP report and blood request form available at the Clinical Transfusion Unit HSB. Standard of audit is all the order for blood transfusion during MTP should comply to the Transfusion Practice Guideline and blood sample for subsequent package of MTP must send together at the same time to laboratory upon collecting on going package. Cases included in audit are from January 2023 to September 2023 (pre-intervention) and from November 2023 to April 2024 (post-intervention). Results: 24 cases audited pre-intervention, 14 cases (58%) involved preanalytical errors. 10 cases audited post-intervention, 4 cases (40%) involved preanalytical errors. Before intervention, the most frequent preanalytical errors are delay in sample (11 cases). Post-intervention, there was a notable decrease only 1 case of sample delay. Noted remarkably improve in mean time of delay sample to the laboratory from 26.9 minutes pre-intervention to 8.3 minutes post-intervention. Conclusion: The introduction of the MTP Bundle Kit has effectively decreased pre-analytical errors as it's accessible, easy to follow and execute.

39. Seroprevalence of Hepatitis E Virus (HEV) Among Blood Donors in University Malaya Medical Centre (UMMC)

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Introduction: Hepatitis E virus (HEV) infection is one of the most common causes of acute viral hepatitis worldwide. Transfusion-transmitted HEV from asymptomatic blood donors poses a threat to immunocompromised recipients. Objective: This study aims to investigate the HEV seroprevalence and risk factors for HEV seropositivity among blood donors in UMMC. Method: Participants filled in an HEV-enhanced surveillance questionnaire. An 8 ml blood samples were tested using Enzyme-linked Immunosorbent Assay (ELISAs) for the detection of Anti-HEV IgM and anti-HEV IgG. Blood donors who were seropositive for HEV were counselled. Results: Between August to October 2023, a total of 500 prospective blood donors were recruited. Findings showed low seroprevalence of HEV infection among blood donors in UMMC, with anti-HEV IgM prevalence at 0.6% (3 out of 500) and anti-HEV IgG prevalence at 2.8% (14 out of 500). Samples from a male donor, a retired director were found seropositive for both anti-HEV IgM and IgG. The risk factors for HEV seropositive include being male, older age (median age 49.5 (29-63)), and Chinese ethnicity. Discussion: Four donors who had recent exposure to HEV could potentially transmit the virus through their blood donations during the asymptomatic viraemia phase. However, seroreactivity does not necessarily indicate the acute viraemia phase as HEV RNA was not performed on these positive samples. Furthermore, no cases of transfusion transmitted HEV infection were reported, for conclusive phylogenetic study of both donors and recipients. Conclusion: Albeit low in HEV seropositivity, the study recommends targeted screening of HEV for blood products intended for immunocompromised recipients.

40. A retrospective study on adverse donor reactions in Hospital Pakar Sultanah Fatimah

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Introduction: Adverse donor reaction (ADR) refers to an unintended consequence of blood donation ranging from local to serious complications. Every adverse event related to blood or blood component donation shall be managed, investigated and documented accordingly. Objective: To assess the prevalence and trend of adverse donor reactions among blood donors in Hospital Pakar Sultanah Fatimah, Muar. Methods: A retrospective analysis was conducted using records in haemovigilance forms of adverse donor reaction and SUKUSA from 2021-2023. Results: A total of 42 (0.15%) cases of ADR were reported from 27,858 donors in which 40 (95%) contributed to generalised reactions whereas the remaining 2 (5%) were local reaction. Mild adverse donor reaction was seen in 67% of the donors followed by moderate reaction (33%); there was no documented cases of severe ADR at our healthcare facility. Younger age group revealed a greater percentage (64%) in adverse donor reaction amongst others. Females in comparison with males demonstrated a slightly higher percentage (52%) in ADR. Donors with body weight of 55 kg and above showed a significantly higher percentage (76%) of adverse donor reactions as opposed to those who weighed less (24%). Pertaining to history of previous donations, ADR was noticeably more common in first-time donors (64%). Discussion: The incidence of vasovagal reaction was highest during this study period from which mild adverse donor reaction makes up most of them. Our research also reported that ADR was commonly seen in younger individuals, female gender and donors who weigh more or equal to 55 kg in addition to first-time donors. These findings are consistent with Malaysia Haemovigilance Report 2021 to 2022. Conclusion: The occurrence of adverse donor reactions at our centre is 0.15%. Therefore, preventive measures must be implemented to improve the safety of blood collection process, especially in younger individuals, females and first-time donors since the incidence of donor reaction following blood donation was found to be higher in these groups.

RED CELL IMMUNOHAEMATOLOGY

41. Cold agglutinins: Review of blood bank cases from 2022 to 2024

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Introduction: Cold agglutinin disease (CAD) is characterised by the presence of cold agglutinins with features of haemolysis. It is a rare form of cold autoimmune haemolytic anaemia (AIHA) and can be associated with a specific infection, an autoimmune disorder or malignancy including lymphoma. Cold agglutinins are auto-antibodies that are typically of the IgM immunoglobulin class, show positive reaction with C3d direct antiglobulin test (DAT) and have a titer of 1:64 or higher at 4°C. The aim of our study is to analyse the clinical and laboratory findings in patients with cold agglutinins. Methodology: We reviewed all reports of antibody identification from the blood bank database from year 2022 to 2024. Results and discussion: There were 14 cases of cold agglutinin reported, accounting for 5.8% of all antibody identification reports, with a male-to-female ratio of 3:4. AIHA was present in seven cases, in which four are known cases of AIHA. These patients had different co-morbidities including trauma, infection, auto-immune diseases and malignancy. Lymphoproliferative disorder was not documented in any of these patients. The mean age was 55 years old (max=85years old, min=6 years old). Both IgG and C3d were positive in 9 cases, whereas in 3 cases only C3d were positive. Two cases showed weak positive reactions with IgG only. In 5 cases, the titer was more than 1:64 at 4°C. The mean haemoglobin on admission was 7.3g/dL (max: 11.8g/dL, min: 4.1g/dL). Reticulocyte count was done in 7 of 14 cases, ranging from 2.8% to 20.2% (n=8). Peripheral blood films were available in 10 of 14 cases, in which red cell agglutinations were observed in five cases. Conclusion: This study showed that although cold agglutinins were reported, haemolysis may not present as a dominant feature. Thus, some data were not available because the tests were not ordered by the clinicians.

42. Frequency of red cell antibodies in paediatrics patients in Hospital Sultan Idris Shah, Serdang

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Introduction: The red blood cell antibodies vary among different age groups and have a clinical significance for their adverse immunological reactions, but no data are available on the Malaysian paediatric population. Objectives: The goals of this study were to determine the prevalence and relative frequencies of red blood cell antibodies in the paediatric population. Methods: We analysed the results of antibody screening and identification tests performed in a period of 17 months from January 2023 to May 2024 at Hospital Sultan Idris Shah, Serdang. A commercially available three-cell antigen panel, DiaCell I, II and III Asia (Bio-Rad) for antibody screening, LISS/Coombs and NaCl/Enzyme card and the ID-Dia Panel (Bio-Rad) for antibody identification were used. Results: Among 712 samples obtained for antibody identification, 30 (4.21%) are in the paediatric age group involving patients aged 7 months to 12 years old. Out of 30 samples, 86.2% are non-clinically significant antibodies. 76.7% (23) of patients had no previous history of transfusion. Seven patients previously had a history of transfusion and only 3 (42.8%) were detected with clinically significant red cell antibody which is anti-E. Most prevalent antibody is anti-M (26.67%) followed by anti-Mia (16.67%) and anti-E (13.33%), whereas 20% resulted in no antibody detected. Inconclusive and non-specific proteins correspond to 6.67%

respectively. Other antibodies include auto IgG (3.33%), anti-Lea (3.33%), anti-Leb (3.33%) and anti-P1 (3.33%). Conclusion: There is limited data involving studies conducted in children. Our study found that the most antibody detected in children is anti-M. Majority of paediatric with red cell antibodies had no history of previous red cell transfusion and the antibodies are non-clinically significant. More research needs to be done in the future to evaluate and determine the prevalence and significance of red cell antibodies in children.

SYSTEM SUPPORTING SAFE TRANSFUSION

43. Audit on compliance rate on blood collection procedure at Blood Bank counter among different categories of clinical staff

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Introduction: Blood transfusion can save and improve the quality of life. However, human error has been recognised as a significant risk factor resulting in Incorrect Blood Component Transfused (IBCT). The cause of IBCT in our hospital in 2022 was due to the failure to cross-check critical details on transfusion-related documents with the blood transfusion checklist. Hence, this audit aimed to assess and increase the compliance rate on blood collection procedures at the blood bank counter among different categories of clinical staff. Methods: This prospective audit was conducted at the Department of Transfusion Medicine of Hospital Sultanah Aminah, Johor Bahru, Johor. It involved two audit cycles, using a questionnaire form which consisted of five items as our audit standards. The auditor observed the ward personnel during the blood collection procedure and inspected the blood transfusion checklist. A total of 30 participants in the first cycle and 60 from the second cycle of audit consisting of House Officers, Staff Nurses and Healthcare Assistants were selected from 1st August 2022 to 31st October 2022 and from 15th October 2023 to 1st November 2023 using convenience sampling. Results: The first audit cycle had a compliance rate of 82.5% among ward personnel, and in the second audit cycle, the result increased to 96.7%, which showed significant improvement. Staff nurses and healthcare assistants significantly improved, reaching a 100% compliance rate in the second audit cycle. There were consistent improvements in compliance rates for all departments, with the majority achieving a 100% compliance rate in the second audit cycle. Implementation of changes: Following the first audit cycle results, revisions were made to the previous checklist for collecting and administering blood/blood components. Conclusion: The improvement of the compliance rate was aided by a revised blood transfusion checklist, continuous training, and staff education, thus statistically helping reduce errors related to transfusion processes in our hospital.

TRANSFUSION EDUCATION

44. A detailed scrutinise of transfusion-transmitted infections (TTIS) in tertiary hospital centre in Kuantan

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Introduction: Effective screening for TTIs is a critical part to ensure that transfusion is safe and to reduce the risk of transmission. Universal donor screening for the major transfusion-relevant viruses, hepatitis B virus (HBV), human immunodeficiency virus (HIV), hepatitis C virus (HCV) and Syphilis. Objective: This study aims to comprehensively evaluate the epidemiology of TTI at HTAA among blood donors. Methods: This retrospective study focused on all reactive donors in HTAA from January to December 2023. Data were systematically extracted from the Blood Bank Information System (BBIS) and analysed using Microsoft Excel. Results: The prevalence of TTIs in 2023 was 0.3%, representing 59 reactive donors out of 15951 collections. The majority being male (67.8%), Malays (74.6%), in the age group 21 to 30 years old (35.6%). Most reactive donors were new (67.8%) and 74.6% were Biological False Reactive (BFR), followed by 16.9% were confirmed cases and 8.5% were NAT RNR. Out of 10 confirmed cases, there were an equal number of HIV and HBV with a percentage of 4% respectively and 70% had disclosed that they have had high risk behaviors (HRB) followed by family history (30%). Discussions: Most reactive donations are BFR, which comprise a significant number of deferred donors. They are only able to be included back to donor pool after several investigations, reducing the number of eligible donors for the time being. As for the 10 confirmed cases, majority are HRB, proving failure counselling due to false declaration. Conclusions: Effective counselling must be performed by trained counsellors with strict privacy to encourage blood donors to be honest and to self-defer. False declarations of HRB happen when individuals considered past HRB are irrelevant and lack of their awareness about the legal consequences. Time constraints and lack of privacy during large mobile operations might contribute to this issue too.

CATEGORY: CASE REPORTS

BLOOD COMPONENT/PRODUCTS

45. Clot and lysis in blood bag and blood segment: Problem and effective solution

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Introduction: Clot and lysis in blood bags and segments might jeopardize transfusion safety and affect pre-transfusion laboratory testing. This study highlights one notable incident and the subsequent interventions to address the related issues. One O Rh(D) positive packed red cells unit was transfused to a 68-year-old medical patient. Case presentation: Approximately three hours into the transfusion, the attending nurse noticed sluggish blood flow in the tubing and identified about 100 ml of large blood clots within the blood bag. The transfusion was immediately stopped, and the implicated blood bag was returned to the blood bank for further examination. The patient experienced a mild allergic reaction, which was subsequently determined to be unrelated to the blood clots observed. Discussion: A root cause analysis (RCA) for this incidence revealed ongoing but unreported issues of clots and lysis in blood bags and segments. Several contributing factors to the problem were identified and discussed, including inadequate blood bag strippers, wrong and non-compliance with proper venesection practices, lack of laboratory surveillance mechanisms for detecting clots and lysis, and patient-specific factors. The Transfusion Medicine department implemented several strategies, including ensuring the adequacy of blood bag strippers, enhancing staff skills through training on venesection and setting up systematic surveillance mechanisms. These measures effectively eliminated further clotting incidence and lysis in both laboratory and clinical wards.

CELLULAR THERAPY

46. Depleting the risk: a case series of bone marrow processing for red cell depletion (BMPRCD) for major ABO mismatched bone marrow Transplants (BMT) in University Malaya Medical Centre (UMMC)

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Introduction: Red blood cell (RBC) depletion is a standard procedure for bone marrow transplants (BMTs) with major ABO mismatch, as unmanipulated grafts containing approximately 25% donor RBCs can cause haemolytic reactions in the recipient. This case series describes a single centre's experience using the TerumoBCT Spectra Optia apheresis system with the BMP module to perform BMPRCD. Case series: The first case, a 51-year-old female with T-cell acute lymphoblastic leukaemia received a haploidentical ABO major mismatch BMT from her 40-year-old male sibling. The initial BM volume was 280 mL with 98 mL of RBCs, which was reduced to 146 mL with 5.8 mL of RBCs after processing. The second case involved a 4-year-old male with severe combined immunodeficiency who received a ABO major mismatch BMT from his 5-month-old female HLA-matched sibling. The initial BM had 50.5 mL of RBCs, hence one unit of compatible leukoreduced irradiated RBCs was added before processing to meet the 125 mL minimum. The final product was 94 mL with 2.8 mL of RBCs. Third case was a 14-year-old male with precursor B-cell acute lymphoblastic leukaemia who received a ABO bi-directional mismatch BMT from his 17-year-old male HLA-matched sibling. The initial 650 mL BM had 195 mL of RBCs, which was reduced to 107 mL with 3.21 mL of RBCs. Further manual plasma reduction processing was performed in view of ABO bi-directional mismatch. Discussion/Conclusion: BMP module allowed efficient RBC depletion (95.6%), reducing processing time and contamination risk compared to manual methods. However, the 125 mL minimum RBC threshold limitation requires addition of compatible RBCs. Preventive measures like slow infusion, hyperhydration and premedication were also done to minimise adverse reactions. There is no safe amount of incompatible RBC infusion hence all steps especially BMPRCD are paramount to mitigate risk of acute haemolysis.

47. Assembling the granulocyte avengers: a case series of apheresis granulocyte collection (AGC) preparation for granulocyte transfusion (GTX) in severe neutropenic paediatric patients at University Malaya Medical Centre (UMMC)

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Introduction: Granulocyte transfusion (GTX) is a cellular therapy as an adjunctive treatment used to treat severe neutropenia in post-chemotherapy and post-haematopoietic stem cell transplant (post-HSCT) patients. It involves infusing buffy coat preparations to increase the absolute neutrophil count (ANC) when it drops below 0.5×10^9/L. Granulocytes can be prepared using two methods: pooled granulocytes concentrate from whole blood buffy coats (PGC) or apheresis granulocytes concentrates (AGC).

AGC methods require volunteer donors, who are sero-negative for Human immunodeficiency virus, Hepatitis B virus, Hepatitis C virus and syphilis, with same ABO blood group as the recipient, stimulated with granulocyte-colony stimulating factor (G-CSF) and dexamethasone prior harvesting via peripheral lines using Spectra Optia PMN module for apheresis. The collected AGCs are cross-matched compatible, irradiated, and transfused within 24 hours of collection. Case series: first is a 1-year-old boy with Atypical Teratoid Rhabdoid Tumour (ATRT), which AGC yield was 6-fold of the dosage required and second is a 15-year-old male with T-cell Acute Lymphoblastic Leukaemia (T-cell ALL), which AGC median yield was 1.1 times of the dosage. Two donors donated on separate dates for the second patient as no improvement in the clinical condition. Discussion/Conclusion: There is variation in clinical outcomes, with one patient recovering from neutropenia and the other succumbing to multi-organ failure due to disease progression. The challenges in AGC are identifying eligible donors for patients while the advantages are higher yield and less allo-immunisation risk to patients. Dosage of the product was deemed sufficient when it achieved granulocyte yield of 6×10^8/kg. The efficacy of GTX is limited to case reports which show more success in paediatric age-groups, and it should be decided upon a case-by-case basis. Further research is needed to better understand the outcomes and optimise the use of GTX.

CLINICAL TRANSFUSION

48. Rh-17: A Rare Diagnostic and Management Inconvenience

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Introduction: Rh antigens are clinically significant and immunogenic. Rare blood phenotype -D- lacks RhCcEe antigens. Anti-Rh17 antibodies pose a challenge in immunohaematology testing. Maximised patient blood management and a good rare blood donor registry are essential to mitigate the potential for unwanted adverse events. Case history: A 51-year-old Bidayuh woman, para 6 had severe symptomatic anaemia (Hb 6.5 g/dL) due to adenomyosis-related abnormal uterine bleeding (AUB). Presented from a private centre due to incompatible transfusion cross-matching. She received many transfusions in the past three years. The pretransfusion test showed O RhD positive, 4+ pan-reaction of antibody screening, negative DCT, and auto-control. Advanced immunohaematology testing confirmed anti-Rh17 with -D-/-D- Rh phenotype. Parenteral iron and 1 pint packed cell transfusion were administered. Post transfusion Hb revealed 13.7 g/dl during TCA four months later. Discussion: This case demonstrates the effectiveness of patient blood management (PBM) measures when managing a rare alloantibody and identifying antibody specificity for future gynaecology management and counselling. The incorporation of PBM strategies while awaiting allogeneic compatible packed cell units was able to optimise the patient's RBC mass. Furthermore, the presence of a national database for rare donors can help the blood transfusion services (BTS) in managing patients with rare blood phenotypes, patients alloimmunised to multiple red cell antigens. Therefore, all efforts should be made to achieve this. Conclusion: In light of the growing importance of personalised and precision transfusion practices, we must understand the prevalence and distribution of -D- antigen across populations, with special attention to rare blood donor screening protocols and registry, patient blood management, and good transfusion strategies to ensure safe and effective blood transfusion thus improves clinical outcomes of such patients.

49. Plasmapharesis: A life saving intervention in severe acute demyelinating encephalomyelitis (ADEM) for a 2-year-old child – a case

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Introduction: Acute disseminated encephalomyelitis (ADEM) is a rare neurological disorder characterised by widespread inflammation in the brain and spinal cord. It typically occurs following a viral infection or vaccination, though the exact cause remains unknown. ADEM usually presents with symptoms such as fever, headache, confusion, and neurological deficits, including weakness, difficulty walking, and vision problems. These symptoms generally develop within days to weeks after the initial infection or vaccination. Case Report: We report the case of a 2-year-old girl who presented with bilateral lower limb weakness a week after an upper respiratory tract infection caused by Influenza A. Her symptoms rapidly progressed to involve the upper limbs within 48 hours. Neurological examination revealed brisk reflexes and muscle power of 2-3 on the Medical Research Council (MRC) scale in both the upper and lower limbs. There were no signs or symptoms of meningitis. Blood tests were unremarkable and a lumbar puncture revealed sterile cerebrospinal fluid with no significant findings. MRI of the brain and spine indicated features consistent with Acute Disseminated Encephalomyelitis (ADEM). Despite completing high-dose steroid treatment and seven cycles of intravenous immunoglobulin (IVIG), her symptoms showed no improvement. Consequently, six cycles of plasmapheresis were initiated, resulting in a remarkable improvement in her condition. Discussion: This case highlights the efficacy of plasmapheresis in treating severe, steroid refractory ADEM. The therapeutic mechanism of plasmapheresis, which involves the removal of pathogenic autoantibodies and immune complexes, is particularly beneficial in conditions driven by immune dysregulation.

50. Managing Jehovah's Witness Pregnant Patient: A Case Report on Patient Blood Management Strategies

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Introduction: Jehovah's Witnesses (JW) is a Christian religion with 8.6 million followers worldwide. According to their interpretation of Bible, blood is holy and sacrosanct, hence transfusions of blood components are prohibited. The Jehovah's Witness Organisation estimates Malaysia's population with a JW was ratio of 1 to 5,959 in 2023. This raised special concern and major challenges, particularly in managing pregnant patients with severe anaemia and during obstetric emergencies. Patient blood management (PBM) seems to be the only management possible in these situations. Case Report 1: 31-years-old Iban lady, Gravida 4, Para 2+1 at 36 weeks+5 days of pregnancy was electively admitted for elective lower segment caesarean section (ELLSCS) and bilateral tubal ligation (BTL) for two previous scars with posterior uterine fibroid. Considering the high risk of patient developing postpartum haemorrhage (PPH), Transfusion Medicine team was consulted for patient blood management, as well as blood transfusion consultation and consent. Following consultation with an obstetrician and a transfusion physician, she provided a written consent, witnessed by her husband, indicating she agreed to receive cryoprecipitate transfusion and plasma derived medicinal products (PDMPs) if necessary. She was transfused intraoperatively with 6 units of cryoprecipitate. Both she and her baby were discharged well. Case Report 2: 36-years-old Iban lady, Gravida 4, Para 2+1 at 37 weeks+5 days of pregnancy was admitted for emergency lower segment caesarean section (EMLSCS) and BTL for refused trial of scar in labour. After consulting with an obstetrician and a transfusion physician, she signed a written consent form stating her agreement to receive only non-blood component factor concentrates in a life-threatening circumstance. She was then operated by skilled obstetrician. The surgery went smoothly without any infusion of factor concentrates. Patient was then discharge well with her baby. Conclusion: These case review series, highlights the necessity of PBM knowledge and appropriateness, which play a critical role in managing these potentially life-threatening situations and can be implemented in any setting that contributes to patient survival.

51. Early Intervention and Multidisciplinary Approach in A Case of Mother with Allo Anti-E and c Significantly Improved Foetal and Neonatal Outcome

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Introduction: Haemolytic disease of the foetus and newborn (HDFN) is characterised by maternal alloantibodies crossing the placenta and binding to foetal erythrocyte antigens, leading to the destruction of foetal erythrocytes. The most common causes are ABO and Rh incompatibility. This abstract discusses a case involving a mother with known allo Anti-E and Anti-c antibodies from a previous pregnancy complicated by HDFN. She was managed by multidisciplinary teams throughout her pregnancy. Case Report: A 43-year-old woman, Gravida 9 Para 7+1, had anti-E and anti-c antibodies detected post-delivery during her 7th pregnancy in 2021, resulting in HDFN and early neonatal death. Her antibody screening was negative during her 6th pregnancy. She presented for antenatal follow-up at 12 weeks of pregnancy. Serial antibody titre monitoring showed an increase in anti-E titre from 4 to 32 at 33 weeks gestation, while anti-c titre remained undetected. This increase coincided with MCA ultrasound Doppler findings indicating foetal anaemia. An uneventful intrauterine transfusion (IUT) was performed. Foetal blood sampling revealed blood group O R1R2 (CDe/cDE) with an Hb of 11 g/dl. The fetus was transfused with group O R1R1 (CDe/CDe) packed cells. The patient received weekly high-dose intravenous immunoglobulin from 33 weeks gestation until delivery. The baby was delivered via elective lower segment cesarean section at 36 weeks. Serial serum bilirubin levels remained below the exchange transfusion level, and no blood transfusion was required. Two weeks post-delivery, maternal anti-E titres elevated to 1:512 and anti-c to 1:2. Discussion: Data from Hospital Sultanah Nur Zahirah (HSNZ) in Terengganu shows that 70.73% of patients with multiple significant alloantibodies have a combination of anti-E and anti-c. This highlights the importance of early referral to fetomaternal specialties and multidisciplinary intervention upon detecting significant alloantibodies during pregnancy to improve foetal and neonatal outcomes.

52. A rare blood group discovery: Understanding the para-bombay phenotype found in Hospital Sungai Buloh

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Introduction: Bombay and Para-Bombay blood groups are classified under rare blood group types in which limited cases are reported worldwide. Classical Bombay individual is known to have no H antigen, A antigen, or B antigen on the red blood cells and are non-secretors. Para-Bombay is another classification under Bombay phenotype. Individuals with this phenotype may carry small amounts of H antigens on the red blood cells or the red blood cells can be devoid of the H antigen. Those antibodies present in Para-Bombay individual may be different when compared to the classical Bombay phenotype. The reported ratio of para-Bombay to Bombay phenotype was 1:15. Case report: 37-year-old pregnant patient, G2P1 at 38 weeks was admitted for Elective Caesarean Section for Cephalo-Pelvic Disproportionate (CPD). T. Official result from National Blood Centre revealed that the patient is confirmed Para-Bombay B RhD Positive. Discussion: Para-Bombay results from a silenced FUT1 gene (h/h) but an active FUT2 (Se/Se or Se/se) gene to synthesise H Type I antigen (and A/B antigens) in the secretions (H-deficient secretors) that may be adsorbed onto RBCs from the plasma or from a mutated *FUT1* gene resulting in great diminished enzyme activity to

produce low amounts of H Type II antigen (and A/B antigens) on the surface of RBCs, which could only be detected by adsorption and elution technique. Hence, confirmatory testing is vital for diagnosing rare blood group type.

53. District hospital challenges: Navigating wrong blood transfusion in Rh(D) negative pregnant woman

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Introduction: Safe O or group O Rh(D) positive packed red blood cells (PRBC) transfusions are accepted in emergency resuscitation in Malaysia but pose risks for childbearing women with unknown Rh(D) typing. This report discusses challenges in district hospitals managing wrong blood transfusions in Rh(D) negative pregnant women and determining prophylactic anti-D dosages to prevent alloimmunisation. Case presentation: A 23-year-old female, primigravida at 6 weeks gestation, was diagnosed with a ruptured ectopic pregnancy at HTAN. She was unbooked, unscreened with no previous blood group record. She required urgent blood transfusion as she developed metabolic acidosis, suspected ongoing intraabdominal bleeding. She received 15 mL of Safe O before her Rh(D) negative status was discovered. The transfusion was stopped, and two units of Rh(D) negative blood were prepared. Standby units of Rh(D) negative blood were sought from the state hospital. She underwent left salpingectomy, subsequently received 1500IU of anti-D immunoglobulin (Rhesonativ). Post-Rhesonativ 12 hours, antibody screening and DCT negative while antibody identification shows weak anti-D pattern with enzyme technique. Discussion: Safe O with Rh(D) negative blood should be prioritised for childbearing women with unknown Rh(D) typing whenever available. District hospitals, often lacking O Rh(D) negative PRBC, should seek standby units from state hospitals. Quantifying the volume of incorrect blood transfused should be accurate by using a weight scale. Pharmacist collaboration is crucial for accurate anti-D Ig dosage based on the specific brand. The weak anti-D pattern identified by enzyme technique was interpreted as the residual presence of anti-D Ig. Follow-up assessments are recommended to monitor the occurrence of alloimmunisation. Conclusion: All childbearing women especially pregnant women with unknown status of Rh(D) should receive RhD negative blood when available in blood inventory. Determining the prophylactic anti-D dosage is crucial to prevent Rh(D) alloimmunisation, which can be challenging without a weight scale in district hospitals.

54. Hope for the little one: A case of intrauterine transfusion for non-immune foetus anaemia in University Malaya Medical Centre (UMMC)

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Introduction: Intrauterine transfusion (IUT) is a critical intervention for foetus experiencing severe anaemia. This procedure involves the direct injection of donor packed cells into the foetus through the umbilical cord. We present a rare case of IUT in UMMC. Case Report: A 35-year- old G 3 P 2+1, was diagnosed to have hydrops foetalis during routine scan at 17-week gestation. During 19-week follow-up scan, the middle cerebral artery peak systolic velocity (MCA PSV) was >1.5 MoM, estimated foetal haemoglobin of 4g/dL, hence IUT was planned with clinical transfusion laboratory. An O RhD negative red cell, reconstituted with AB plasma whole blood, leucodepleted, irradiated and crossmatched compatible with mother's blood was issued. Discussion/Conclusion: IUT is a rare procedure and requires proper planning from all parties involved. The challenges of IUT for transfusion medicine include getting O RhD negative blood donors, timely processing of the fresh whole blood and secondary processing. For IUT, we have issued O-negative packed cell reconstitution with AB plasma to reduce risk of alloimmunisation as foetus blood group was unknown. Fresh blood unit was used to ensure efficacy of the transfused cells and reduce risk of hyperkalaemia. We then proceeded with leucodepletion to prevent CMV transmission and reduce immunological reactions. Lastly, the product was irradiated with 25 Gy to prevent transfusion associated graft-versus-host disease. Manually removal of donor's plasma to haematocrit target of 75-80%, matching the foetus' blood was performed. Transfusing the highly viscous red cell concentrate via blood infusion set was difficult and necessitated manual aspiration and transfusion using a 10cc syringe. Hence, we reconstituted a whole blood with a lower haematocrit (67%) during the second IUT for the same patient. Unfortunately, the foetus was not viable one day after the second IUT. Good communication and teamwork from all multi-disciplinary teams is the key to successful IUT blood product preparation.

55. Chilling precision: Unravelling the mysteries of cold antibodies

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Introduction: Paroxysmal Cold Haemoglobinuria (PCH) and Cold Agglutinin Disease (CAD) are rare autoimmune haemolytic anaemia characterised by the presence of cold-reactive antibodies. PCH is caused by the Donath-Landsteiner (DL) antibody, which is an anti-P IgG antibody, while CAD is caused by IgM antibody, leading to premature destruction of red blood cells through complement activation. These conditions may manifest as secondary to other conditions such as viral/bacterial infections or autoimmune diseases causing intravascular haemorrhage characterised by sudden onset of haemoglobinuria. Diagnosis can be delayed due to its ability to resemble other haemolytic anaemia hence a good diagnostic approach is crucial for effective management. Case report: This is a case of a 3-year-old child presented with febrile fit, haemoglobinuria and dusky digits over bilateral upper and lower limbs at day 8 of illness. Prior to admission, the child had coryzal symptoms and was treated by a general practitioner. Laboratory investigations show raised lactate dehydrogenase, acute drop of haemoglobin (Hb 11.7 g/dL to Hb 3.4 g/dL), unconjugated hyperbilirubinemia, direct antiglobulin test positive with complement and peripheral blood film suggestive of haemolysis with erythrophagocytosis. To establish the diagnosis, DL test was performed but haemolysis was seen in test tube A2 (incubated in 4°C then at 37°C), B2 (incubated in 4°C) and C2 (incubated in 37 °C) which shows false positive result and PCH was excluded. On further testing, cold agglutinin titre was significant; >1:1024 in 4 and 37 °C with broad thermal range and presence of auto anti-I which conclude the clinical diagnosis of CAD. Throughout the admission patient required multiple packed cell transfusion and exchange transfusion before being discharged well home. Discussion/Conclusion: When assessing potential causes of haemolytic diseases, it is essential to relate clinical presentation and conduct a comprehensive laboratory test focused on identifying and evaluating our highly suspect diagnosis.

56. Acute haemolysis transfusion reaction in transfusion dependent thalassaemia: A case report

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Introduction: Haemolytic transfusion reactions involve haemolysis of transfused red cells due to the presence of preformed antibodies. They most commonly result from ABO incompatible transfusion, but they can also occur because of the presence of antibodies to other blood groups. In Thalassaemia transfusion dependent patients, they are at increased risk of developing multiple alloantibodies due to frequent exposure to donor red cells. Case Summary: An 11-year-old Malay girl with underlying HbE Beta Thalassaemia (history of first transfusion at 6-year-old) came to daycare for her monthly blood transfusion. She was transfused with 1 unit of packed red cell. However, 2 hours post-transfusion, the patient complained of chills, nausea, vomiting and fever. On examination, the patient was comfortable and looked jaundice up to face with mild splenomegaly. No hepatomegaly palpable. Blood investigations showed increased in haemoglobin from 8.5g/dL to 11.1g/dL, total bilirubin increased from 92 umol/L (indirect bilirubin: 83 umol/L) to 176 umol/L (indirect bilirubin 166 umol/L). Lactate dehydrogenase was also raised (514 U/L). Urine analysis showed haemoglobinuria (1+). Antibody screening was negative pre and post-transfusion. Direct antiglobulin test showed weak reaction (pre-transfusion) and 1+ (post-transfusion). Red blood cells phenotyping of the donor cells reveals Fya+ and Jka+ while the patient's baseline was Fya- and Jka-. Discussion: This is a rare case of acute haemolytic transfusion reaction due to anti-Duffy and anti-Kidd antibodies which usually present with delayed haemolytic reaction. These antibodies are difficult to detect and haemoglobinuria usually occurs. Specifically for this case, the antibody could not be detected in the patient. Early interventions should be taken to prevent hypotension, shock and acute kidney failure and most importantly, to provide antigen negative blood in subsequent transfusion to prevent recurrence of the event.

57. Can two Rh positive parents have a Rh-negative child?

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Introduction: The Rh system has been extensively studied and is clinically relevant in the field of transfusion medicine. The complexity of the Rh system begins with highly polymorphic gene and immunogenic antigens. Rh proteins require the presence of Rh-associated glycoprotein for proper assembly in the RBC membrane. Majority of people in Malaysia are Rh positive. Approximately, 45% of Rh-positive individuals are homozygous and 55% are heterozygous. Case Report: A baby boy born term at 40 weeks 2 days via spontaneous vaginal delivery in Hospital Tengku Ampuan Afzan, Kuantan. At day 1 of life, he was admitted to SCN for pathological neonatal jaundice. Subsequently, blood grouping and coombs test were carried out for the baby. The results are blood group A Rh (D) negative with a phenotype of rr (cde/cde) and was negative for direct anti-humanglobulin test (DAT). Record of mother's blood group in BBISv2 was shown as O Rh (D) positive. Chaos emerged when the baby's father claimed his blood group was A Rh (D) positive. Further investigations were done for both parents to look for their phenotypes. The results revealed his mother's blood group is O positive and his father's blood group is A positive with both parents phenotype are R1r (CDe/cde). Discussion: This occurrence showed possibility of two individuals who are Rh (D) positive producing a child

with Rh (D) negative. In both parents with heterozygous Rh phenotype, there is a 25% chance of having a Rh-negative offspring in every pregnancy. In this case study, neither parent passes along Rhesus D allele to the child and is proved by the Mandelian Law of Inheritance. Attention focus on the laboratory side in dilemma issuing blood to the baby. Addressing the dilemma, blood Rh (D) negative shall be given to the baby.

58. Hospital Sibu Experience on Delayed Haemolytic Transfusion Reaction Due to Anti-Jka - A Case Report

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Introduction: Delayed haemolytic transfusion reactions (DHTR) defined as reaction that occur anytime between 24 hours to 28 days after cessation of transfusion. It can be asymptomatic or mimic other conditions and often be misdiagnosed. Kidd antibodies are the most frequently encountered antibodies responsible for DHTR due to antibody characteristic of their transient nature and their frequent dosage effect. This condition remains as a major challenge in its management. Case Report 1: 35-years-old Chinese lady, presented to the Emergency Department (ED) with complaints of fever and epigastric pain for 3 days and developed jaundice 1 day ago. Further (100) history reveals that patient have underlying bilateral ovarian cysts. Two weeks ago she was admitted and treated for SLE with central nervous system vasculitis with a haemoglobin of 7.0 (g/dL) and a platelet count of 290 (10^3/mm). She was then transfused with two units of packed red cells and was discharged with haemoglobin of 9.4 (g/dL). Four days after current admission, transfusionist was consulted regarding suspected DHTR. Blood findings showed haemolytic features with haemoglobin 7.3 (g/dL), white blood cells (WBC) 3.4 (10^3/mm), platelets 145 (10^3/mm), retics 3.3%, LDH 1004, direct coombs test 3+ with IgG 1+, indirect bilirubin 79, urine (100) haemoglobin 4+, but no haemolysis features were visible on peripheral blood films. The transfusion reaction was investigated, and antibody screening results shows that cell 2 was 2+ and cell 3 was 1+, with antibody identification as Anti-Jka - identified and all previous pre-transfusion testing for antibody screening were negative and all crossmatched were compatible. After few days of observation patient was discharged well with haemoglobin of 7.3 (g/dL) and LDH: 532 without receiving any blood transfusion. Conclusion: This case review emphasises the necessity of improving awareness and managing DHTR caused by Anti-Jka. It is essential to understand and (100) recognise that alloantibodies can induce severe haemolysis in blood recipients and that blood transfusion is not without risk.

59. A rare case of delayed haemolytic transfusion reaction in di (A+B-) following incompatible blood transfusion

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Introduction: The Diego blood group system consists of 23 antigens carried on a multipass erythroid band 3 protein anion exchanger 1 (AE1), the product of a single gene, SLC4A1. The most clinically significant Diego antigens are Di a, Di b, and Wr a. The antibodies towards these antigens can cause haemolytic transfusion reaction (HTR) and haemolytic disease of the newborn (HDN). Here, we report a case of a multiple comorbid patient with Di(a+b-) who developed delayed haemolytic transfusion reaction (DHTR) following incompatible blood transfusion. Case report: A 46-year-old lady, para 0+5 with underlying diabetes mellitus, ischemic heart disease (IHD) with heart failure, and end stage renal failure (ESRF) was admitted due to dialysis catheter-related blood stream infection. Initially, her haemoglobin was 10.7g/dL and subsequently developed two episodes of lower gastrointestinal (LGIT) bleeding. Her haemoglobin dropped to 6.1g/dL. The initial crossmatch with 20 units of packed red cell (PRC) showed 2+ to 3+ incompatibility. Further investigation showed she was Di(a+b-) with anti-Di b. As she developed anaemia-induced angina, blood transfusion was unavoidable despite the crossmatch reaction strength ranging from 1+ to 2+. A total of 10 units of PRC were transfused. As prophylaxis for HTR, 80mg (1mg/kg) oral prednisolone was prescribed prior to transfusion. However, she still developed DHTR three weeks after the first transfusion. This was evidenced by reducing haemoglobin, increasing lactate dehydrogenase, positive direct Coombs test and full blood picture. She was treated conservatively with tapering prednisolone dose over two weeks in the ward. The patient was discharged after fifty-eight days of hospitalisation with haemoglobin of 7.3 g/dL. Conclusion: This case highlights an extremely rare but clinically significant anti-Di b antibody which caused DHTR. Thus, identifying DHTR following transfusion of incompatible blood and incorporating patient blood management is important to improve patient outcomes.

60. Exchange transfusion in pertussis-induced hyperleukocytosis in infants: A case series

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Introduction: Pertussis is a highly contagious virus caused by *Bordetella Pertussis* that spreads via airborne droplets. It affects 100% of non-immune household contacts and is related to high morbidity and mortality of infants. The pathophysiology of Pertussis infection is mainly due to toxin-mediated severe leukocytosis, which contributes to pulmonary hypertension via blocking pulmonary capillaries and restricting blood flow. Exchange transfusion (ET) is a safe technique to rapidly reduce the leukocytes. This study discusses two cases of pertussis induced hyperleukocytosis with acute respiratory distress (ARD) and the effectiveness of ET. Case reports: The cases involved two infants aged 12-month-old and 1-month-old who presented with ARD and required mechanical

ventilation. Diagnosis was established by clinical deterioration with positive Polymerase Chain Reaction (PCR) of respiratory secretion and severe hyperleukocytosis. Both underwent a double volume ET for leucodepletion after leukocytes more than 100 x 10^9/L were documented. The outcome of the 12-month-old infant responded well to ET by a massive reduction in leukocyte count from 131 to 40.6 × 10^9/L immediately post-procedure, concurrent with oxygen therapy and a course of Azythromycin without developing pulmonary hypertension. Her respiratory symptoms subsided after a total of 17-days on oxygen therapy and was discharged home well. In contrast, the 1-month-old child passed away on day 2 of admission despite successful ET with reduction of leukocyte count from 114 to 22 × 10^9/L. She developed pulmonary hypertension 10 hours post-procedure after noted blood-stained mucus during airway suctioning. She rapidly deteriorated further and succumbed to the disease due to severe ARD with pulmonary hypertension and multiorgan failure fulfilling the criteria of malignant pertussis, thus, fatal outcome. Discussion: Early ET proved a beneficial life-saving treatment in infants with critical pertussis and hyperleukocytosis preventing cardiopulmonary complications despite variable outcomes due to multifactorial causes.

61. A case report: Incorrect blood component transfused case in Hospital Seberang Jaya, Pulau Pinang

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Introduction: Incorrect blood component transfused (IBCT) is a taboo in transfusion medicine world. Hospital Seberang Jaya (HSJ) was free of such incident for so many years. However, transfusion error has occurred in HSJ in 2022. This actual incident had been an eye opener after average of at least 5 near miss cases reported every year. Case report: An 82-year-old female patient (Patient A) was admitted to Surgical Ward for upper gastrointestinal bleeding. The next day, Blood Bank received GXM 2-unit packed cells request for this patient. Crossmatch tests were completed. Subsequently, patient started to have large amount hematemesis and immediately pushed to endoscope room for urgent esophagogastroduodenoscopy alongside a 78-year-old female patient (Patient B) for same reason. However, no one expected transfusion error would happen moments later. Patient B was wrongly transfused with Patient A's packed cells. Discussion: Incorrect blood component transfused (IBCT) between these two patients involved same ABO blood group; O positive. Following the IBCT incident, affected patient B was generally well and stable with no harm reported. Investigation performed revealed that there was no incompatibility detected between her plasma and the transfused blood and no evidence of haemolysis. Days after, she was reported well, asymptomatic without any complication with haemoglobin level 11.1 g/dL. Root cause analysis meeting had been performed by hospital administration department to determine the corrective and preventive measures in order to prevent the recurrence. Such incident usually did not pinpoint only to one person fault. It was multifactorial causes which arose to one question; is it the system or our own ethics and morale which compromised our patient safety? Following this, regular audit had been conducted to evaluate staff compliance on pre transfusion checking prior to blood transfusion. We also came out with improvise checklist to ease the usage among staff.

62. Exchange transfusion in pertussis-induced hyperleukocytosis in infants: A case series

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Introduction: Pertussis is a highly contagious virus caused by *Bordetella Pertussis* that spreads via airborne droplets. It affects 100% of non-immune household contacts and is related to high morbidity and mortality of infants. The pathophysiology of Pertussis infection is mainly due to toxin-mediated severe leukocytosis, which contributes to pulmonary hypertension via blocking pulmonary capillaries and restricting blood flow. Exchange transfusion (ET) is a safe technique to rapidly reduce the leukocytes. This study discusses two cases of pertussis induced hyperleukocytosis with acute respiratory distress (ARD) and the effectiveness of ET. Case reports: The cases involved two infants aged 12-month-old and 1-month-old who presented with ARD and required mechanical ventilation. Diagnosis was established by clinical deterioration with positive Polymerase Chain Reaction (PCR) of respiratory secretion and severe hyperleukocytosis. Both underwent a double volume ET for leucodepletion after leukocytes more than 100 × 10^9/L were documented. The outcome of the 12-month-old infant responded well to ET by massive reduction in leukocytes count from 131 to 40.6 × 10^9/L immediately post procedure, concurrent with oxygen therapy and a course of Azythromycin without developing pulmonary hypertension. Her respiratory symptoms subsided after a total of 17-days on oxygen therapy and was discharged home well. In contrast, the 1-month-old child passed away on day 2 of admission despite successful ET with reduction of leukocyte count from 114 to 22 × 10^9/L. She developed pulmonary hypertension 10 hours post procedure after noted blood-stained mucus during airway suctioning. She rapidly deteriorated further and succumbed to the disease due to severe ARD with pulmonary hypertension and multiorgan failure fulfilling the criteria of malignant pertussis, thus, fatal outcome. Discussion: Early ET proved a beneficial life-saving treatment in infants with critical pertussis and hyperleukocytosis preventing cardiopulmonary complications despite variable outcome due to multifactorial causes.

DONOR AND BLOOD SUPPLY

63. Occult Hepatitis C Infection (OCI): Peek A Boo or Mind-Boggling Game

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Introduction: A significant global health concern is viral hepatitis, which is linked to an alarming increase in disease-related deaths globally 1-3. Diagnostically hepatitis B is well established compared to hepatitis C and OCI remains a mystery. Method and results: A cross-sectional study was conducted at NBC from 2022-March 2024, all reactive cases (RC) were included and analysed descriptively. 33% of the RC is HCV. Among HCVRC, 13% is concordance and 87% is aHCV repeatedly reactive (aHCVRR). A 20% of positive line-immunoassay (LIA) was identified. While, remaining of 80% of HCVRC is most probable OCI. A 45% of donor who were back to donor pool (BTDP) resuming blood donation and noted 12% with aHCVRR. Furthermore, raising trend of HCVRC from 32% to 37% and 47%, by comparing 1 st quartile of 3 years 2022-2024 respectively. Discussion: OCI is defined as an absence of HCV RNA in serum but presence in either hepatocyte or peripheral blood mononuclear cells (PBMCs) 4. OCI subtype is classified into seropositive or seronegative according to the existence of aHCV 5. Outcome of this study showed a raised of HCVRC by 15% since 2022. 80% were identified as probable seropositive OCI as the sensitivity of LIA relied on host immunity and genotype. 12% of aHCVRR identified among BTDP population is likely of OCI. Postulation of seropositive is an individual who recovered from HCV which the immune system able to restrict HCV replication but failed to clear HCV completely. Seronegative is caused by immune escape and extremely low titre of HCV. At present, there is no standardisation in the approach to OCI. Conclusion: Indeed, OCI in blood transfusion service, triggered mind boggling thoughts and management of donors requires diverse knowledge to ensure best care is rendered to blood donors.

OTHERS

64. Transfusion-transmitted malarial infection – A case report

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Introduction: Transfusion-transmitted parasitic infections, though rare compared to bacterial or viral ones, pose a significant threat in endemic areas due to limitations in conventional diagnostic methods such as microscopic blood film examination for malarial parasites (BFMP), which fail to fully mitigate the risk of parasitaemia. Case report: A 61-year-old Sabahan male, admitted for traumatic brain injury and polytrauma in February 2020, received a packed red blood cell transfusion and subsequently developed persistent fever. Blood film examination revealed *Plasmodium malariae*, confirmed by PCR, leading to prolonged hospitalisation for malaria treatment. The look back and recall procedure confirmed transfusion-transmitted parasitic infections, as the donor tested positive for *Plasmodium malariae*. The other recipient of blood components from the same donation was not tested, as the patient had already succumbed to death due to severe sepsis secondary to small bowel obstruction with bowel ischemia. The donor's recent donation before seroconversion detection was in November 2019, and the recipient of the blood donation tested negative for malaria. Discussion: Blood centres in endemic regions prioritise donor selection criteria and screening using blood films, but their limited sensitivity necessitates skilled interpretation. Rapid Diagnostic Tests (RDTs) serve as adjuncts, while PCR confirms the diagnosis. Future research should gather data on malarial prevalence in donors and transfusion-transmitted infections to enhance screening and detection methods.

65. Navigating the obstetric odyssey: a case report of pregnancy complicated with Von Willebrand disease

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Introduction: Von Willebrand disease (VWD) is the most common autosomal dominant hereditary bleeding disorder, caused by a deficiency or dysfunction of the von Willebrand factor. Pregnant women with VWD face increased risks of bleeding complications, particularly during and after delivery period. Effective management and close monitoring are essential to ensure maternal and foetal safety, requiring a multidisciplinary approach to address the unique haemostatic challenges posed by pregnancy. Case Report: We report the case of a 28-year-old pregnant lady with von Willebrand disease Type 2 who came for delivery. Discussion: This case study demonstrates the successful management of von Willebrand disease in a pregnant woman. Utilising a multidisciplinary team, alongside tailored treatment strategies, the patient achieved a safe and successful pregnancy outcome. This case highlights the importance of specialised care and collaboration in addressing the unique challenges posed by von Willebrand disease during pregnancy, ultimately leading to a positive clinical outcome for both the mother and her newborn.

66. Case report: Blood Bank alchemy: Turning challenges into solutions for nucleic acid testing laboratory in University Malaya Medical Centre

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Introduction: Blood donor nucleic acid testing (NAT) on Human Immunodeficiency Virus (HIV), Hepatitis B Virus (HBV) and Hepatitis C Virus (HCV) is mandatory testing for all donations in Malaysia. The Transfusion Medicine Department (TMD) University Malaya Medical Centre (UMMC) has implemented NAT testing since 2014 and was handled by Medical Microbiology Department. Since 2022, NAT laboratory was relocated to TMD. Case report: We report our challenges in setting up a new NAT laboratory, using ROCHE COBAS 6800 System, a Polymerase Chain Reaction (PCR) based NAT. Earlier planning included sourcing a location suitable enough to house a 292 × 216 × 129 cm analyser. Serial meetings with multiple stakeholders were conducted to ensure a construction of a proper NAT laboratory. TMD personnel also visited the NAT laboratory of the National Blood Centre to learn from the NAT experts. Upon setting up the NAT lab at TMD, workflow optimisation was performed. Interlaboratory performance evaluations were conducted to ensure quality NAT results. Technical and clinical personnel user training was done on all TMD staff handling donors and donations. One of the challenges we faced was the waste management from the analyser was pungent and we had to consult an Occupational Safety and Health Engineer for clearance. The department subsequently provided 3M biohazard respirator for all staff handling waste. Since setting up a NAT laboratory in 2022, a total 46,320 samples were tested to date and 33 samples (0.072%) were found to be reactive for HIV, HBV and HCV. Over the years, familiarisation with the system contributed to improved NAT turnaround time and higher staff satisfaction. Conclusion: Establishing a nucleic acid testing (NAT) laboratory involves proper planning, personnel training, and efficient workflow management. These challenges impact accurate NAT testing and improve transfusion safety. Continuous monitoring and education are important to ensure quality NAT performance.

PLATELET AND GRANULOCYTE IMMUNOBIOLOGY

67. Managing HLA-matched platelet transfusion support for a patient with platelet refractoriness

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Introduction: Platelet transfusion refractoriness is defined as an incident in which post-transfusion platelet count fails to raise to the expected level. A corrected count increment (CCI) of < 5,000/µL one hour post-transfusion is associated with immune factors. Antibody to Human Leukocyte Antigen (HLA) Class I is the most common contributor to immune platelet refractoriness. Objective: This is to provide an information on the complexity in supporting the best treatment for a patient with platelet refractoriness associated with HLA Class I antibody. Method/ Case Description: This is a case of six-year-old Chinese girl who was diagnosed with Acute Myeloid Leukaemia. Chemotherapy was unable to be commenced due to persistent thrombocytopenia with platelet count of $<10 \times 10^9$/L. The case was also complicated with haematuria. Despite repeated random platelet transfusion, platelet count remained single digit. The case was referred to the National Blood Centre for platelet refractoriness investigation and transfusion support. Results: Platelet immunology screening revealed patient had HLA Class I antibody. While awaiting for HLA investigations, platelet crossmatch was performed. Crossmatched compatible platelet units were supplied immediately. Search for HLA matched platelet donor was done in NBC Platelet Donor Registry. However, no 4/4 matched donor were found. Twenty-four donors were found to be ¾ matched. HLA antibody test was performed. Patient's serum was tested for HLA antibody by Luminex (Luminex Corporation, Austin, Texas) bead assay from LIFECODES Life Screen Deluxe (Immucor, Georgia, USA). Patient's PRA was 100% with multiple Class I HLA antibodies. Matching with antibody result were done and unfortunately only 2 donors do not have cognate antigen towards patient's antibody. The donors were contacted and planned for platelet apheresis collection. HLA matched and crossmatch compatible platelet units were supplied and have helped to increase patient's platelet count. Conclusion: Supporting patient with HLA antibody induced platelet refractoriness is a complex procedure. A big registry of HLA typed platelet donors must be maintained by a transfusion medicine centre in order to offer the best treatment to patient.

RED CELL IMMUNOHAEMATOLOGY

68. Mystery unravels in cold autoimmune haemolytic anaemia

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Introduction: ABO typing is one of the essential tests for pre-transfusion testing. Discrepancy between forward and reverse grouping in ABO typing can complicate patient's blood group typing. We report a case of ABO discrepancy due to cold agglutinin autoimmune haemolytic anaemia with underlying mycoplasma pneumonia infection. Case summary: An eighty-year-old Chinese man with underlying chronic obstructive pulmonary disease was admitted for atypical pneumonia, haemolytic anaemia and liver derangement. He presented with signs and symptoms of upper respiratory tract infection. His physical examination revealed bibasal lung crepitation, lymphadenopathy and purpuric rash over both hands. The patient's haemoglobin level was 8.7 g/dL. Haemolytic markers like lactate dehydrogenase, indirect bilirubin and reticulocyte counts were raised while haptoglobin results were low. At that time, full blood picture (FBP) showed evidence of immune haemolysis. Mycoplasma was detected with titre

at 1:80. Upon receipt, the patient sample clot. ABO disparity was observed, indicating pan-agglutination at both the forward and reverse groupings. Thus, we proceed with prewarm technique and saline replacement technique which were inconclusive. We proceeded with Dithiothreitol (DTT) treatment of red cells which showed that the patient's blood group was O Rh(D) positive. In view of direct coombs test were positive for complement and IgG, we also proceeded with cold agglutination titre that showed non-specific cold agglutinin with titre more than 1:1024 most probably due to mycoplasma infection. Patient was discharged home after complete azithromycin. Discussion: Cold agglutinin disease (CAD) react at lower temperature thus can produce false positive laboratory results in immunohematological examinations such as blood grouping or antibody identification. In our case, we needed a few days to resolve ABO discrepancy of the patient. Conclusion: Erroneous results in immunohematological testing caused by cold agglutinins might create unnecessary delays in patient care.

69. Daratumumab therapy and transfusion safety: Lessons from a case of multiple myeloma

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Introduction: Daratumumab is an anti-CD 38 monoclonal antibody which is highly efficacious in relapsed and refractory multiple myeloma. Daratumumab interferes with pre-transfusion testing by binding to the red blood cells (RBC) and causing pan-agglutination. This case report aims to illustrate Daratumumab interference during indirect antiglobulin tests, its resolution steps and subsequent transfusion management. Case reports: It features a 69-year-old Malay male with underlying refractory multiple myeloma, currently on his 3rd chemotherapy regime which includes Daratumumab. He presented with fever, loose stool and symptomatic anaemia with a haemoglobin level of 6.9 g/dl, necessitating treatment for acute gastroenteritis and red cell transfusion. Both of his antibody screening and identification showed pan-agglutination, and the auto-control and Direct Coombs tests were positive and showed IgG specificity. His RBC phenotype was invalid due to recent blood transfusions. Subsequently, antibody screening was done using dithiothreitol (DTT)-treated reagent cells and turned out to be negative. However, crossmatching using DTT-treated donor cells resulted in lysis. Accordingly, his blood sample was sent to the National Blood Centre for RBC genotyping. In conclusion, an impression of pan-agglutination most likely due to Daratumumab with no underlying alloantibody was made and if the patient need a blood transfusion, to provide ABO and best-matched phenotype blood. Discussion: This case report shows how Daratumumab lead to extensive blood bank workups, delays in the provision of compatible blood and compromising patient safety because pan-agglutination can mask the presence of alloantibody. In summary, there should be effective communication between clinicians and transfusion service before initiation of Daratumumab. Transfusion services should develop a blood transfusion management algorithm for patients treated with Daratumumab which includes methods to negate Daratumumab interference. Ideally, before initiation of Daratumumab, all patients should have their baseline type and screen to identify any alloantibody present and extended RBC phenotype or genotype because this would be helpful in providing compatible blood, especially in urgent situations.

70. Abo discrepant among Kenyah people lead to discovery of Cis-AB blood grouping in Miri

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Introduction: Cis-AB blood phenotype has attracted attention in transfusion medicine because of the interesting phenomenon that a single allele encodes both A and B antigen, as opposed to the typical trans-AB genotype. It was first discovered in 1964 as having an unusual inheritance pattern of both A and B gene from one parent. Later, it was named as cis-AB to discriminate this rare phenotype from the trans AB phenotype. Case Report: We reported two cases with a similar pattern of ABO discrepancy. The first case involved a 32-year-old female blood donor, while the second case involved a 38-year-old female admitted for Bartholin cyst abscess. Both were from Kenyah tribe in Sarawak but had no history of blood transfusion or other comorbidities that can affect the red cell antigen expression. Mixed field agglutination with antisera B was observed in forward ABO typing and weak agglutination with B cells in the reverse grouping. A strong reaction was demonstrated with anti-H lectin while no reaction was observed with anti-A1 lectin or O cells. Absorption and elution detected the presence of antigen B. These cases were further referred to the National Blood Centre and the genotyping result showed the presence of cisAB/O1. Discussion: Cis-AB is reported to be globally rare, yet it is relatively common in East Asian populations, with a marked prevalence among Koreans (0.0354%), followed by Japanese (0.0012%) and Chinese (0.00066%) blood donors. Serologically the presence of A, weakened B and elevated H antigens on the red blood cells (RBCs) should raise the suspicion for cis-AB. Therefore, ABO discrepant results must be interpreted carefully especially among Kenyah population. Theoretically, type O red cells and AB platelets or plasma are recommended for blood transfusion in cis-AB patients.

71. Complexity of two-faced anti-M: A case series

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Introduction: Anti-M is a naturally occurring antibody of the MNS group system usually reactive at below room temperature and regarded to be clinically insignificant. 3 cases of clinically significant anti-M in HTAR; one 'immunising' type and other two 'naturally occurring'. Case report: Case 1: 22-year-old male with underlying aplastic anaemia on regular blood transfusion, admitted for symptomatic anaemia with haemoglobin of 4.4g/dl. Two unit of packed red cells were requested, and the blood group was typed as A Rh (D) positive. Case 2: 3-year-old boy treated for tuberculosis meningitis, was planned for right external ventricular drain. His haemoglobin was 10.5 g/dL, thus 2 units of packed cell was requested and there was no previous history of transfusion. Case 3: 10-month-old girl, admitted for severe RSV pneumonia and iron deficiency anaemia. Her haemoglobin level was 7.8 g/dL. The ABO grouping showed Group A with extra reaction at A1 cells. Discussion: Anti-M has varied presentation, it occurs individually as non-complement activating, IgM antibody and complement activating IgG antibody, existing alone or in combination. Anti-M may be naturally occurring or immune-mediated due to sensitisation in previous pregnancy, transfusion, or transplantation. These are of blood banking interest as it causes ABO discrepancy in reverse grouping and crossmatch incompatibility at 37° C. Anti-M is more commonly found in children than adults, often in the setting of infection. The abundant sialic acid on glycophorin A, on which MN antigens are present in some infected hosts may evoke so-called naturally occurring anti-M during immune response to invading pathogens. Although allo anti-M usually exhibits 'transfusion-related anti-M attenuation', the significant appearance of the antibody in immunologically compromised patients may be due to the failure of immune accommodation. In these reported case series, this clinically significance antibody urges the necessity of careful evaluation of each case of anti-M present to ensure safe transfusion practice.

72. Unmasking anti-E antibodies: A case of rapid alloimmunisation post single transfusion in a lung cancer patient

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Introduction: Alloimmunisation is a significant complication in patients requiring repeated blood transfusions. This case presents a unique instance of rapid development of anti-E antibodies following a single transfusion in a patient undergoing chemotherapy for lung cancer. Objective: We report a case of rapid alloimmunisation of anti-E antibody in IPPT, PPUSMB. Case reports: A 66-year-old male with a recent diagnosis of lung cancer in January 2024, currently undergoing chemotherapy with cisplatin, etoposide, and atezolizumab, presented for his fourth cycle of treatment. His baseline haemoglobin was 9.8 g/dL. Upon arrival, his haemoglobin was noted to have dropped to 5.6 g/dL. The patient reported significant fatigue but had no signs of bleeding. The patient had received one unit of packed red cells (PRC) a month ago, for a haemoglobin level of 7.8 g/dL. This was his only transfusion prior to the current presentation. Initial blood tests indicated severe anaemia, prompting a blood transfusion. Cross-matching revealed the presence of anti-E antibodies, which was an unexpected finding given his limited transfusion history. The development of anti-E antibodies after a single transfusion is uncommon and noteworthy. Discussions: This case highlights the rapid onset of anti-E alloimmunisation in a chemotherapy patient after a single transfusion. It underscores the importance of vigilant monitoring and thorough cross-matching in patients with malignancies requiring frequent transfusions. Awareness and early detection of such antibodies are crucial for the management and prevention of haemolytic transfusion reactions. This case suggests that even a single transfusion can lead to significant alloimmunisation, emphasising the need for meticulous blood type matching and antibody screening in oncology patients. It also prompts consideration for the development of guidelines to manage and prevent alloimmunisation in patients with limited transfusion histories.

73. Anti-Kpb: A case report

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Introduction: The Kp is a new antigen of the Kell family. It is recognised by a high titer antibody (anti-Kpb). Only two Kp (b-) individuals were found in trials of 5,500 unrelated individuals, suggesting that the frequency of Kpb genes may be greater than 0.98. There are currently four provable antigens in the Kell family: K, k, Kpa, and Kpb. Four different combinations of genes were found: KKpb, kKpa, kKpb and one gene just called K0 (K-zero). Antibodies usually require an indirect Coombs test for detection. Case reports: We report a case of 50-years-old Malay lady with underlying symptomatic anaemia. Method: Serological identification was performed on patient's sample using (i) normal antibody panels (ii) papain treatments (iii) panel cells for tube method using standard procedures. A serologic red cells phenotype for C, c, E, e, K, k, Fya, Fyb, Jka, Jkb, M, N, S, s, antigen were performed according to the manufacturer's instructions. Known Kp(a+b-) phenotype packed cells were tested with patient samples to confirm the findings. Results & Discussion: Patient's blood group is found to be group B Rh (D) positive. The antibody panel and papain-treated panels were pan-reactive with negative autocontrol result. Negative result was acquired when panel was treated with DTT. Blood compatibility was determined by crossmatching patient's serums with known Kp(a+b-) phenotype packed red blood cells. Major cross-matched between patient's serum and known cell containing Kp(a+b-) phenotype was compatible. Laboratory findings indicate that anti-Kpb was identified in the patient's serum. Conclusion: Development of anti-Kpb remains a great challenge to Transfusion Services in this country. Concerted approach of management involving various disciplines in the

country as well as international networking for Transfusion Services are important in managing many cases of high incidence of this rare phenotype.

74. Anti-f antibody in a 54-year-old female

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Introduction: The Rh blood group is expressed in the presence of two genes *RhD* and *RHCE*, which then produce into five major Rh antigens (D, C, c, E, e). When a person inherits *RHCE* genes which encode for both the c and e antigens, additional f antigen is also expressed. However, there is a rare antibody corresponding to this compound antigen that left the laboratory with a question, "What antibody is this?" Case report: A 54 years old Iban lady initially investigated for right supraclavicular lymphadenopathy with haemoglobin of 5.4 g/dl. In her antibody identification test, anti-c and anti-e (anti-f) were detected. She had a recent transfusion of 2 units of crossmatch-compatible packed cells one month prior to anti-f detection. After alloadsorption with rr cells, negative reactions are seen indicating that anti-c and anti-e were completely adsorbed out. Fortunately, this patient didn't develop any delayed haemolytic transfusion reaction. Two units of B positive c-negative units or R1R1 (DCe/DCe) crossmatched by gel card method were found to be compatible. She was then diagnosed with Acute Myeloid Leukaemia and received regular phenotyped donor unit and crossmatched compatible unit, the blood transfusion without adverse transfusion reaction. Discussion: Antibody to f antigen is relatively rare but significant enough to cause haemolytic transfusion reaction. It can be suspected when both c and e antibody are identified concurrently. This alloantibody is usually developed by an individual who lacks of the compound antigen f (ce). Patients with anti-f antibodies can safely be transfused with red cells lacking the c or e antigen.

75. C in trans to RhD: Is it possible?

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Introduction: D variants have altered D epitopes and/or decreased antigen copies per red cell. Individuals carrying these variants may test antigen negative, weakly positive, or positive by serology, and may or may not be at risk of alloimmunisation after exposure. We report a case of pregnant lady with D variants possibly C in trans to RhD. Case summary: A 31-year-old Indian lady primigravida at 22 weeks, came for routine antenatal check-up. Group Screen and Hold (GSH) sent from antenatal clinic. ABO grouping showed blood group is A, with D typing showed mixed field reaction using automation and tube method. Repeated D typing with anti-D different clones showed similar mixed field reaction. Rhesus phenotyping for this patient showed 4+ reaction with anti-C, anti-c and anti-e. Possible Rh phenotype for this patient are DCe/dce (R1r) or Dce/dCe (R0r'). Mixed field reactions are suggestive of phenotype R0r' with C in trans to D, weakening expression of the D antigen in this patient. Discussion: C In trans to RhD originally described as position effect or gene interaction effect, the allele carrying RHD is in the trans (opposite haplotype) position to the allele carrying C. An example of the haplotype is Dce/dCe. The Rh antigen is normal but the arrangement is said to interfere with the expression of the D antigen on the cell membrane. This interference is not seen in the haplotype arrangement when the C gene is inherited in cis (same haplotype) position to RHD, as in the haplotype DCe/dce. Conclusion: Serologically the difference in the two haplotypes cannot be determined, however this is not needed because the D antigen is structurally complete. Patient with D variant will be considered as RhD negative and should only receive RhD negative red cells for transfusion. Molecular typing is needed for confirmation of D variant.

76. Notorious naturally occurring anti-M complicating ABO grouping

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Introduction: Cold-reacting antibodies, particularly anti-M of the MNS blood group system, can interfere with reverse ABO typing, leading to discrepancies in the results. This is especially problematic in patients with blood types A, B, and AB, as their reverse typing should normally demonstrate negativity in one or both of the reagent red blood cells. The high prevalence of the M antigen on reagent red blood cells and the nature of testing reverse grouping at room temperature contribute to these discrepancies. Case report: 27-year-old gentleman due for major elective surgery and Group, Screen, and Hold (GSH) was sent. GSH revealed ABO discrepancy with additional reactions over reverse grouping seen. Further investigation using the tube method at 37°C and antibody screening identified the presence of naturally occurring, clinically insignificant allo anti-M in the patient's plasma which does not react at 37°C. Discussion/Conclusion: In order to resolve reverse ABO discrepancies caused by alloantibodies or autoantibodies, it is crucial to follow a systematic approach. This includes completing an antibody screen and identification panel, pre-warming the patient's plasma and reagent red blood cells separately at 37°C, and then conducting reverse ABO testing. Successful pre-warming can effectively eliminate the interference from these cold-reacting antibodies, and discrepancies caused by cold alloantibodies are usually resolved after testing at strict pre-warmed temperature. Reagent cells phenotyping was done and noted to be M antigen

positive, hence initial ABO discrepancy was due to the patient's allo anti-M reacting with the reagent red cell used. Patients with clinically significant anti-M require special consideration during blood transfusions, as they require red blood cells that are negative for the M antigen. This case emphasises the importance of identifying and managing cold-reacting antibodies to ensure accurate ABO grouping and safe blood transfusions.

77. A case study: Daratumumab interference in immunohaematology testing

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Introduction: Daratumumab, is an anti-cancer drug which is highly efficacious and widely used in treating patients with multiple myeloma. Unfortunately, it can interfere with immunohaematological tests causing the need for extensive blood bank work ups and often lead to delay in provision of compatible blood for transfusion, thus compromising patient safety. In this study, we would like to demonstrate a case of Daratumumab interference in immunohaematological tests involving a patient who was on Daratumumab therapy. Case report: A 66-year-old female lady with underlying End Stage Renal Failure and multiple myeloma on Daratumumab therapy was electively admitted to Hospital Seberang Jaya (HSJ) for transposition of left brachio-cephalic fistula under regional block anaesthesia. Prior to operation, the treating clinician noted that her haemoglobin level was low (7.0 g/dL) and she was planned for transfusion of one unit packed cell. Thus, a Group & Crossmatch (GXM) request was sent to Blood Bank. Based on record search in Blood Bank Information System Version 2 (BBISV2), she did not have any transfusion record in HSJ. ABORh grouping revealed blood group B RhD positive while antibody screening showed positive result. In view of this, antibody identification test was performed to identify specificity of any antibody present. Antibody identification test revealed panagglutination reactions in all 11 panels for both LISS and Papain (Enzyme) panels with negative autocontrol result. During crossmatching test, we experienced difficulties to find compatible blood for transfusion. In view of this, the case was referred to Immunohaematology Laboratory, Hospital Pulau Pinang (HPP) for further testing and to get compatible blood for transfusion. In HPP, antibody screening was repeated with Dithiothreitol (DTT) treated cells and revealed negative result. Eventually, HPP was able to supply us 1 unit of compatible blood after crossmatching performed using DTT treated donor cells. Discussion: Daratumumab is a monoclonal antibody (anti-CD38) which binds to CD38 antigen that is highly expressed on myeloma cells resulting in destructions of the cells. Unfortunately, Daratumumab also interacts with patient's/ donor's red blood cells and results in generation of false positive antibody screening result and difficulties during crossmatching test. This interference required extensive and laborious Blood Bank work ups and often lead to delay in provision of compatible blood for transfusion, thus compromising patient safety. As the clinical use of Daratumumab is increasing nowadays, timely and effective communication between treating clinician and Blood Bank staff is important for patient's best care. Clinicians and Blood Bank staff should be made aware of Daratumumab interference with immunohaematology tests and it is important to ensure the patient has baseline ABORh blood group and antibody screening before starting Daratumumab. Apart from that, Blood Bank should also develop a flow or protocol in handling cases of Daratumumab interference when performing immunohematological tests to avoid delay in blood supply for patient safety.

78. A proposed algorithm for investigation of cold agglutinin disease in blood bank: A case report

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Introduction: Cold agglutinins are circulating autoantibody directed against red blood cells (RBC) antigens, causing RBC agglutination. Cold agglutinin disease (CAD) should be considered in the differential diagnosis of elderly patients with incidental findings of high mean corpuscular volume (MCV), mean corpuscular haemoglobin (MCH) and mean corpuscular haemoglobin concentration (MCHC). A stepwise laboratory testing approach can help confirm the diagnosis. We report the case of a 75-year-old gentleman admitted for a syncopal attack, incidentally found to have high MCV, MCH and MCHC values. A full blood picture (FBP) showed numerous RBC agglutination. After the prewarming procedure, the MCV, MCH and MCHC values normalised, and there was no evidence of RBC agglutination on FBP. A polyspecific direct antiglobulin test (DAT) showed a positive reaction (1+) and a monospecific DAT was negative for IgG and weak positive for C3d. Antibody screening and identification at 4°C showed polyagglutination reaction with a positive auto-control. Following an autoadsorption procedure, antibody screening, antibody identification and autocontrol were negative. A cold agglutinin titer was 1:256, and further investigation revealed a positive anti-I using adult O cells and a negative anti-i using cord O cells. Haemolysis work-up parameters were normal with normal haemoglobin levels. In conclusion, the patient likely has primary cold agglutinin (CAD) due to anti-I (IgM) autoantibody. As he did not exhibit symptomatic anaemia or cold-induced symptoms, he is currently being managed supportively. From this case, an algorithmic proposal was developed to streamline the investigation of cold agglutinin disease in blood banks.

79. A rare anti-Jk3 alloantibody in a case of severe anaemia at term pregnancy

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Introduction: The Kidd blood group system includes Jka, Jkb and Jk3 antigens. These antigens are found on type 3 glycoproteins

on red blood cells and act as urea transporters. Individuals lacking all Kidd antigens (Jknull) are susceptible to developing anti-Jk3 alloantibody. Case report: A 37-year-old Malay lady, Gravida 3 Para 2 was referred for symptomatic anaemia (syncopal attack) with a haemoglobin level of 6.7 g/dL at 37 weeks and 3 days of gestation. She had a history of postpartum haemorrhage requiring packed cell transfusion. A full blood picture and iron profile portrayed an iron deficiency picture. Her blood group was A Rh (D) positive. Antibody screening using BIO-RAD ID-DiaCell I-II-III was positive. Antibody identification using BIO-RAD ID-Diapanel-P revealed pan-agglutination with a negative autocontrol. The Direct Coombs test was negative. Other phenotypes were R1R1, Jk (a−b−). The suspected anti-Jk3 antibody prompted a referral to the National Blood Centre (NBC). The urea test showed the red cells were not lysed immediately. The results confirmed the presence of rare antibody-Jk3 with anti-Jka alloantibodies. The patient was counselled about the rare alloantibody and received intravenous iron therapy. One unit of compatible blood was requested from NBC for standby. Later, the patient was delivered to Hospital Tunku Azizah via emergency caesarean section with no transfusion needed. Discussion: The prevalence of the Jk (a-b) phenotype in Malaysia was 0.002%. Maintaining a rare donor registry in local settings and notification to NBC accordingly is recommended. Family screening for rare blood groups is also advised. Managing the inventory of rare blood groups involves strategies like cryo-preservation of red cells and considering alternatives such as intravenous iron. A multidisciplinary approach (obstetrician and transfusionist) is crucial to address the transfusion needs of patients with rare blood groups.

80. Case of incompatible crossmatch in a patient with anti-Chido/Rodgers

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Introduction: Providing antigen-negative blood and compatible units pose a great challenge to laboratory services with limited resources when dealing with antibodies against antigen of high frequency in the population. Case report: A 50-year-old gentleman presented to the district hospital with symptomatic anaemia. 5 units of blood crossmatched were found incompatible as patient was known to have anti-E and anti-Chido/Rodgers. Sample was sent to tertiary hospital for further investigation. Out of the 20 units of red cells crossmatched, 6 units were found compatible. Repeat crossmatch was performed and 2 units were found incompatible with weak reactivity. Hence,3 units of red cells were supplied. 3 hours post transfusion of 1 unit of red cells, patient developed fever (38°C). Transfusion reaction workup was initiated and the unit of red cell transfused were found to be incompatible with weak reactivity. Re-identification of antibody shows no new allo-antibody. Conclusion: Anti- Chido/Rodgers have not been found to cause haemolytic transfusion reaction/haemolytic disease of fetus & newborn, the implications of providing compatible blood in a timely manner do present a challenge in centre with limited resources. The transfusion services might consider provision of serological least incompatible blood in dealing with these not considered clinically significant red cell antibodies as they do not cause a reduction in red cell survival.

81. Rare anti-MAM among 'pregnant mom' patient: A case report

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Introduction: MAM blood group system was first detected in a pregnant woman and is one type of high-prevalence antigen (International Society of Blood Transfusion [ISBT] 041). Anti-MAM can cause haemolytic disease of the newborn and shorten the RBC survival after transfusion of incompatible RBC.[2] Case report: We present a case of anti-MAM in a 41-year-old Malay lady, G2P1 at 29 weeks of pregnancy. Mother was admitted for severe pre-eclampsia and prolonged cough with underlying ovarian cyst, obesity, diabetes mellitus and hypertension. In 2018 family screening was done as she is a family member of anti-MAM positive index. Antibody screening at that time was negative and red cell phenotype was R1R1 (CDe/CDe), Jka-b+, kk, Fya+b+, kk, MM, Ss. Mother had 2 pregnancies (2020 and 2024) and antibody screenings were positive. First child was delivered with no complications, but second child was a premature baby (29 weeks), birth weight of 1.22 kg and admitted for 1 month for prematurity complicated with intraventricular haemorrhage and anaemia, resolved neonatal jaundice (NNJ), respiratory distress syndrome and presumed sepsis (thrombocytopenia and leukopenia). Baby was well upon discharge. No haemolytic workup as clinician unaware of the mother's antibody. Baby's haemoglobin dropped from 16 g/dL to 9 g/dL but no blood transfusion was required. In 2020, mother's antibody screening positive in Cell I, II, III, Direct Agglutination Test (DAT) was negative in which suggestive of inconclusive antibody. In 2024, antibody screening positive (3+) in Cell I, II, III, pan-agglutination with negative auto control, and negative DAT suggesting inconclusive antibody or to exclude rare antibody as tested in local laboratory. Further investigation was done in National Blood Centre, Kuala Lumpur and the result suggestive of anti-MAM. More advanced testing is scheduled in the International Blood Group Reference Laboratory (IBGRL) in Bristol, England. Discussion: A multidisciplinary approach with deeper understanding of rare blood groups and their implications are essential to optimise the management as the antibody itself usually appears during pregnancy. Antibody screening during pregnancy in targeted populations should be implemented along with effective counselling.

82. A female patient with rare anti-Indian B: A case report

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Introduction: The Indian blood group system was named as such because the first In (a+) individuals were from India. There are now five antigens in the system, designated IN and number 023 by the ISBT. Antibodies of these antigens are usually IgG and reactive in the antiglobulin phase of testing and do not bind to the complement. Anti-In(a) and Anti-In(b) alloantibodies are commonly produced in In(b) and In(a) homozygotes respectively, as a response to blood transfusion or pregnancy. Case Report: We present a case of a 68-year-old Indian woman who presented with chest pain and shortness of breath with underlying issues of diabetes, hypertension, congestive cardiac failure with ischemic dilated cardiomyopathy and chronic kidney disease. She has had multiple admissions for the similar complain over the last 3 years. In 2020, during her first admission her antibody screening was noted to be positive but the antibody identification turned out to be inconclusive. She has been transfused with packed blood cells (PRBCs) once in 2023 and the antibody identification was also inconclusive at that time. She was transfused with 2 units of PRBCs during this admission which were least incompatible and there was only minimal increase in haemoglobin post-transfusion. Her samples were then sent to the National Blood Centre, Kuala Lumpur for further testing in which In(b) antibody was identified. Discussion: The antigens in this system are located on CD44, a single-pass membrane glycoprotein that is encoded by the CD44 gene on chromosome 11 at position p13. The biologic function of CD44 is as a leukocyte-homing receptor and cellular adhesion molecule. The In(a) and In(b) antigens have been detected on erythrocytes, granulocytes, lymphocytes, and on various haematopoietic cell lines. In(a) and In(b) are weakly expressed on cord RBCs and are sensitive to treatment with ficin, papain, and DTT but are resistant to glycine-acid EDTA.

83. Rare severe haemolytic disease of the foetus and newborn requiring exchange transfusion due to anti-Fyb

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Introduction: Red cell alloimmunisation to antigens other than D, such as C, c, E, e and the antigens in Kell and Duffy have emerged as an important cause of haemolytic disease of foetus and newborn (HDFN). HDFN due to maternal anti-Fya is rarely reported. However, HDFN due to anti-Fyb is even rarer and has never been reported in modern literature, to the best of our knowledge. Case Reports: We present a rare case of severe HDFN due to maternal anti-Fyb alloantibodies in a newborn born to a mother with a Fyb-negative phenotype. Despite timely administration of interventions, including phototherapy and immunoglobulin treatment, the neonate developed significant jaundice with bilirubin levels beyond the exchange transfusion threshold. One unit of Fyb negative Reconstituted Whole Blood was prepared for exchange transfusion. Conclusion: This case reinforces the importance of routine antenatal antibody screening programmes to identify maternal alloantibodies beyond the more commonly studied anti-D. Early detection allows for timely interventions and better communication with the obstetrics team, which eventually reduces the morbidity and mortality associated with HDFN in newborns.

84. Classical Bombay and Parabombay phenotypes: Peculiar cases among pregnant Penan and Kenyah women in Bintulu and Miri, Sarawak

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Introduction: Classical Bombay and Parabombay phenotypes are considered to be significantly rare blood groups with more prevalence cases among the Indian population. Most of the Penans and Kenyahs are indigenous peoples living in rural Sarawak. The unexpected rare blood phenotype among them pose huge challenges for the blood transfusion services especially in the laboratory investigation and the procurement of compatible blood units for patients. Case report: We reported two cases of Classical Bombay from Penan and Kenyah while two Parabombay cases were detected among pregnant Penan women who came at term for delivery. Forward grouping showed no agglutination with anti-A and anti-B. Reverse grouping using A and B cells revealed strong reaction. These patterns can be interpreted as O blood group. However, patients' red blood cells did not react with anti-H lectin and had a reaction with O cells. The detection of anti-H antibodies and incompatible crossmatching with group O gives an additional clue. Cases were referred to the National Blood Centre that concluded the Classical Bombay and Parabombay phenotypes through secretor studies, absorption-elution tests and RBC genotyping. Discussion: This study highlighted the importance of careful interpretation of blood grouping including the availability of reverse grouping O cells and anti-H lectin reagent in laboratory. The recent discovery of rare blood phenotypes among these two ethnic groups further necessitates targeted screening for their population and collaboration with primary health care in early antenatal screening for pregnant Penan and Kenyah women. Prompt detection of the Bombay or Parabombay phenotype is important as it remarkably impacts transfusion management. Blood procurement from a fresh rare donor or frozen blood stock concurrently with family screening for compatible blood shall be considered to prepare patients during peripartum period. Optimisation of haemoglobin with the administration of oral or intravenous iron is also part of patient blood management.

85. New anti-D autoantibody in the case of severe hyperhaemolysis in transfusion-dependent-thalassaemia patient: A case report

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Introduction: Hyperhaemolysis syndrome (HS) is a rare and poorly understood complication of red cell transfusion. It can occur in patients with β-thalassaemia, especially in transfusion- dependent (TDT) form. HS is characterised by severe intravascular and extravascular haemolysis, resulting in lower post-transfusion haemoglobin (Hb) levels than pre-transfusion. Case Report: We present the case of a 22-year-old Malay male patient with β-thalassaemia who presented with abdominal pain for one day, jaundice and palpitation. His baseline Hb was 6.5 g/dL, but his Hb was 3.8 g/dL upon admission. He had a recent history of four pints packed red cells transfusion from the referring hospital within one month prior. He was diagnosed clinically with Hyperhaemolysis Syndrome with underlying Intraabdominal Sepsis by the clinical haematology team. IV methylprednisolone and IV Immunoglobulin were given. Laboratory evidence demonstrated reticulocytopenia and markedly elevated LDH, but interestingly, mild haemolysis and hyperbilirubinaemia. The patient had a history of known multiple red blood cells antibodies, including Anti-E, Anti-c, Anti-S, Probable Anti-Mia, and Auto-Anti I. Immunohaematological (IH) testing for admission sample exhibited newly developed anti-D on patients' eluates and plasma. The Anti-D was later concluded as an Auto-Anti D antibody by Rh (D) molecular genotyping. Patients was eventually transfused with Rh (D) positive, and antigen negative blood for other known alloantibodies, with steroids as premedication. Conclusion: Avoiding red cell transfusion is challenging in hyperhaemolysis, especially in TDT β-thalassaemia. Detailed IH serology and molecular testing can detect implicated antibodies in HS and the subsequent choice of the best blood phenotype if the blood transfusion is inevitable. Clinicians should always be vigilant to monitor patients with β-thalassaemia for signs of HS following transfusion.

86. Case report: A missed Parabombay a phenotype in an elderly patient

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Introduction & Case reports: We report a case of a 91-year-old female who was admitted for abdominal pain and severe anaemia. ABO grouping showed a discrepancy in which the forward reaction was suggestive of group O but the reverse reaction showed 0: A cells, 4+: B cells and 0:O cells. Direct and indirect antibody screenings were negative. Further tests confirmed her blood group as Parabombay A; anti-H Lectin test was negative whereas absorption/elution and saliva secretory study indicated presence of A and H antigens and substances respectively. The patient had received five O positive packed cells in two previous hospitals whereby no further testing was conducted despite an ABO discrepancy and she was typed as O positive. All the blood supplied were compatible at AHG/37°C and antibody screening was negative. All transfusions were uneventful. Discussion: Parabombay, a rare phenotype closely linked to Bombay, results from abnormalities in the *FUT1* gene: a mutated *FUT1* with or without a functioning *FUT2* gene, or a silent FUT1 with a functioning *FUT2* gene. Phenotypically, red blood cells either completely lack ABH antigens with ABH substances present in secretions or may express minimal ABH antigens on the red blood cells with or without ABH substances in secretions. Due to these features, Parabombay can be missed, often mistaken as group O without extended testing. The clinical implications of transfusing O positive red cells to a Parabombay patient can vary depending on the presence and strength of the antibodies. In this case, crossmatch was compatible with group O positive red cells and the patient did not experience any post-transfusion reactions, possibly due to weak or absent anti-H/IH antibodies. Conclusion: This case illustrates the potential for a blood group misreporting, particularly when discrepancies in the blood grouping are inadequately investigated. Accurate blood grouping is essential to ensure safe transfusions.

SYSTEM SUPPORTING SAFE

87. Single error, two patients. Concurrent acute haemolytic transfusion reactions due to ABO-incompatible and Rh-incompatible transfusion error: A case report

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Introduction & Case Report: Mr O, a 49-year-old medical male of blood group O Rh(D) positive required packed red blood cells transfusion. Forty minutes after the transfusion commenced, he had episodes of chills, dyspnoea and hypertension. Transfusion was stopped, and the blood bag and the patient's sample were returned for transfusion reaction workup. Through clerical rechecking by laboratory staff, the blood card was correctly intended for the patient, not the blood bag. The blood bag was A Rh(D) positive. Mr O had an ABO-incompatible transfusion error supported by incompatible post-transfusion re-crossmatching and heat elution of newly positive DAT. The wrong blood bag was intended for Mr A, a patient with A Rh(D) positive, R1R1 phenotype and was known to have Anti-E & Anti-c antibodies. While Mr A had received O Rh(D) positive blood, which is ABO compatible, the post-transfusion

re-crossmatching test was incompatible as the blood bag was typed as R1R2 (E-positive red blood cell). Mr A experienced chills and rigour during the transfusion. DAT was stronger in positivity after transfusion error. Elution demonstrated Anti-E specificity for the post-transfusion sample, which was not observed in the pre-transfusion sample. Mr A had an ABO-compatible transfusion error but was unmatched for the Rh phenotype (specific requirement not met). Both patients were managed and subsequently discharged well. Discussion: The root causes of the mishap were the switching of blood cards and the non-compliance with the transfusion checklist by the involved personnel. Several preventive measures were employed, including an improved transfusion checklist with additional specific parameters and visual information, introducing a one-patient-at-one-time policy while supplying blood products, medical education for targeted staff, clinical audit, and surveillance for compliance through CCTV at the blood bank counter.

CATEGORY: OTHERS

BLOOD COMPONENTS/PRODUCTS

88. Phenotype leuco-reduced red cells: A revised work process

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Introduction: Leucocyte-reduced (LR) is a method to remove white blood cells from blood component prior to transfusion via filtration. Established benefits of LR are prevention of febrile non-haemolytic transfusion reactions (FNHTR), alloimmunisation and cytomegalovirus (CMV) transmission. Previously, red cells were filtered within 48 hours of collection by random selection, thus only about 20% of demand for phenotype LR red cells were fulfilled. To increase the supply, a revised work process was done in November 2023 whereby the red cells were filtered within 5 days of collection, based on request. Method and results: A cross-sectional study was conducted at the NBC between November 2022-May 2023 (pre-revised work process), and November 2023-May 2024 (post-revised work process). Pre-revised showed supply of phenotype LR red cells was 1,146 units while post-revised supply was 4,512 units. Majority were prepared on day 3 of collection (70%), day 2 (13.9%) and day 4(13.6%). Pre-revised reported one mild allergic reaction case involving a Day 2 LR while post revised reported FNHTR cases involving Day 3 LR. Discussion: The implementation of revised work process showed an increment of 394% supplied of phenotype LR red cells with two transfusion reaction cases reported. Though we observed relatively increase reported transfusion reaction cases, more data need to be studied to conclude it is due to older blood being filtered. Conclusion: Revised work process for preparation of phenotype LR red cells manage to increase the supply by 394%. Proper planning, effective communication & continuous monitoring is crucial to ensure good outcome.

89. Validation of Sysmex XN-1000 and platelet yields comparative results at Pusat Darah Negara, Kuala Lumpur

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Introduction: The XN analyser is a 6-part differential analyser which measures up to 36 parameters for whole blood and 7 parameters for body fluid (optional). This validation is categorised as a prospective validation which does not rely on previous validation reports and all data collected and sample preparation are new. Material and Methods: The validation process involves short-term imprecision (reproducibility) with normal pathological samples. Performed 10 sequential measurements for each sample. Inter-Run Precision uses XN Check level 1, 2 and 3 as a sample and analysed in duplicate for 15 days period. A method comparison was carried out between Sysmex XN-1000 and Mindray BC-6200. Carryover and linearity studies are also constructed. The current reference interval was validated with 21 and 20 normal female and male donors respectively. Results: XN-1000 demonstrated a good performance in both within and inter-run precision. Overall, CV% or SD for all parameters were within the allowable limit. In carryover study, XN-1000 had showed an excellent performance with average of less than 0.1% of carryover. The linearity had been verified according to the manufacturer defined range. XN-1000 showed good correlation with current BC-6200 based on the r 2 value, 95% CI slope and y-intercept criteria except for platelet yield samples [r 2 – 0.79]. All FBC parameters for female and male donors did not exceed the unacceptable limit of 10%. Discussion: XN-1000 showed good performances which includes studies of accuracy, within and inter-run precision, carryover, method comparison (whole blood), linearity and reference interval. However, platelet yields sample for platelet measurements showed a significant difference and a correlation study presented a low bias to XN-1000 compared to BC-6200. Conclusions: The overall performance of Sysmex XN-1000 is excellent and has a good correlation with current Mindray BC-6200 for all parameters (except for platelet yields). The data reflect the robustness of the XN-1000 to provide the consistent and precise results especially in the monitoring of each apheresis platelet donor at the Pusat Darah Negara, Kuala Lumpur.

90. Low titre O whole blood (LTOWB): Maximising selection of potential donors using donor factors at National Blood Centre, Kuala Lumpur

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Introduction: Low titre O whole blood (LTOWB) has been regaining popularity, especially in emergency trauma settings, but not widely used yet in Malaysia. Testing for LTOWB employs a similar testing method used to assess the suitability of donated O Rh(D) positive whole blood units to be reserved as "Emergency O" (EO), which is used for exchange transfusion in neonates. Increasing popularity of LTOWB will result in increasing demand, despite only being found in 10% of O Rh(D) positive donors. Objective: To determine the association between donor factors and successful LTOWB donations. Methods: This is a retrospective, cross-sectional study that reviewed the demographic data and the immunohaematology testing results of Group O Rh(D) positive whole blood donors that were tested for suitability to be used as EO in the National Blood Centre, Kuala Lumpur. Demographic data reviewed includes age, gender and ethnicity. LTOWB donors are defined as having negative results from the semi-quantitative testing for anti-A and anti-B, as well as negative for haemolysin. Results: A total of 1170 donors' data was analysed. The prevalence of LTOWB donors was 11.8%. Initial descriptive analysis showed higher prevalence of LTOWB with increasing age categories and among the male gender. Donors of Chinese ethnicity generally showed a higher prevalence of LTOWB, which was 14.3%. Simple Logistic Regression (SLR) showed only age and gender were statistically significant donor factors. This was proceeded with Multiple Logistic Regression (MLR), which showed a 1-year increase in donor age has 1.036 times the odds of being a successful LTOWB donor when adjusted to gender; and male donors have 2.324 times the odds compared to females of being a successful LTOWB donor when adjusted to age. Conclusion: Older age and male gender are significantly associated with successful LTOWB donations among Rh(D) positive whole blood donors.

91. Fresh frozen plasma cold chain assessment from the National Blood Centre Kuala Lumpur to Queen Elizabeth II Hospital Sabah

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Introduction: Transporting fresh frozen plasma (FFP) in a frozen condition requires stringent temperature control to ensure the plasma is still suitable for therapeutic clinical use. The FFP cold chain should be maintained at or below -18°C, with an optimal range of -25°C to -30°C. Validating insulated shipping containers ensures that the method consistently maintains the required temperature range. Objective: To determine the appropriate container design, insulation qualities, and cooling capacity for effectively transporting FFP from National Blood Centre Kuala Lumpur (NBCKL) to Queen Elizabeth II Hospital (HQE II) in Sabah. Method: Six (6) boxes were prepared according to the packaging configuration. Each box contains 20 units of FFP and is sealed with 10 kg of dry ice. Each box was equipped with a temperature data logger to continuously record the internal temperature during transportation. All boxes were transported via 2 separate air shipments by the POS LAJU courier service. The temperature of the 6 containers was traced for data analysis. Result: All six (6) shipment boxes maintained the temperature within the required range. However, 16.7% of units of the FFP were broken during the first shipment and 1.67% of units of the FFP were broken during the second shipment. The total duration for the first shipment to arrive in HQE II was 22 hours 30 minutes and 24 hours 30 minutes for the second shipment. Conclusion: The containers successfully maintained the required temperature range during both shipments, indicating that the insulation and cooling capacity were adequate for the duration of transport. Reinforce the packaging to prevent movement and potential breakage during transport.

92. Collecting more than needed volume of whole blood favourable or trouble; Reflection of National Blood Centre

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Introduction: Malaysia has established basic blood collection guidelines by following internationally recognised standards. Many facets of attributes suggested to ensure safety of both donor and patient. Whole blood is typically obtained from donors and stored in blood bags that are specifically designed with anticoagulant labelled for 350 mL or 450 mL volume, respectively. Therefore, blood bags that do not meet the standards; low volumes will be discarded; in contrast, overweight collections are used with shorter expiration dates. There are two schools of thought on what constitutes being overweight. A significant increase of overweight collections has been observed recently. This raises the question of whether quality of red blood cells obtained from overweight bags is compromised. Method and result: A simple descriptive analysis was conducted retrospectively for 2023 exploring overweight collection in NBC. This study reflected out of total whole blood collection in NBC 207,224 (352) equivalent to 0.17%. However, mean average overweight of 0.15% for NBC and 0.63% for central region collection. In addition, data reflected approximately 50 blood bags ends up with shorter expiry due to overweight. Discussion: Strategic planning is necessary if self-sufficiency and sustainability in blood supply are to be achieved. In addition to the many measures taken, it is also important to ensure that resource waste, such as excessive weight collection, is avoided. Furthermore, being overweight results in a shorter expiry, which adds to additional burden on blood bank staffs. Examining the root causes of overweight collections results in improvements and way forward for transfusion service. Conclusion: Lack of adequate modernised equipment and human resources is a major factor in

the overweight collection. However, a definitional determination and reassessment of current practices ought to be carried out for prompt rectification. Furthermore, without taking a step forward, this dilemma will continue to persist in the near future.

93: Improved Visual Inspection Reference (Vir) To Reduce Disposal Rate of Red Cells Contaminated Platelet Concentrates

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Introduction: The rate of discarded platelet concentrates (PCs) due to red blood cells contamination (RBCC) has been increased from 2.2% in June 2019 to 3.1% in June 2020. This is due to the ambiguity of visual inspection prior to release, even though the process was guided by the existing visual inspection reference (VIR). This study was then conducted to improve the VIR in assisting product release. Methods: Red blood cells (RBC) from three units of normal colour PCs (control) were quantified prior to adding 0.1 ml of RBC and 56 units of discarded PCs were sampled to quantify the RBC level. Results: The average RBC level of normal PCs is 0.03 g/L and increased to 0.04 g/L after adding 0.1 ml RBC. 85.7% of discarded PCs have RBC level ≤ 0.04 g/L with spectrum colour appearances while 14.3% contain > 0.04 g/L RBC with red to brownish in colour. The colour was then scaled and the existing VIR was revised and use as a new guide for product release. After the implementation of improved VIR, the discard rate in January until March 2024 noted to be reduced as compared to January until March 2023 from 2.33% to 1.07% respectively. Discussion: The RBC level in discarded PCs should not be more than 0.04 g/L to avoid them from being discarded as RBCC products. Conclusion: Improved VIR by including more colour scale had proven to be of help in visual inspection during product release, hence able to reduce PCs disposal due to RBCC.

CLINICAL TRANSFUSION

94. Measuring success: A study of GSH implementation and its influence on CT ratio in NICU at Hospital Sungai Buloh

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Introduction: Neonates, especially extremely low birth weight infants, are among the groups of patients undergoing transfusion frequently. The majority of them are likely to receive at least one red cell transfusion as they often become anaemic, partly due to iatrogenic blood losses. Therefore, in Sungai Buloh Hospital, the usual practice involves allocating Group Crossmatch (GXM) Paedi Packed Cells for every Neonatal Intensive Care Unit (NICU) blood request, irrespective of confirmation of blood usage. Unfortunately, this approach has increased the NICU crossmatch to transfusion (CT) Ratio, consequently impacting the overall CT Ratio (>2.0). Method: Data collected before the intervention from January to June 2023 shows that the NICU CT Ratio was always >2.0. GSH was then introduced in July 2023 and the post intervention data collected from August until December 2023. Discussion: An observable improvement in the NICU CT Ratio was perceived immediately following the implementation of GSH usage, simultaneously improving the overall CT ratio (<2.0). This new implementation helps to save resources and lessen the laboratory workload. Several factors that contributed to the subsequent increase in CT ratio were identified, such as the presence of new staff or insufficient exposure and training among the staff. Some reinforcement strategies were implemented such as reminders during meetings and circulated memos, conducted re-training sessions, and Continuing Medical Education (CME), especially for the new staffs.

95. Evaluating the Effectiveness of PBM in Pre-Operative Haemoglobin Optimisation at Hospital Sultanah Nur Zahirah

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Introduction: This study evaluated the practices of the first pillar of Patient Blood Management (PBM), focusing on pre-operative haemoglobin optimisation before major surgery after PBM implementation. It emphasised the importance of early detection and management of pre-operative anaemia at Hospital Sultanah Nur Zahirah (HSNZ), Terengganu. Objectives: The primary goal was to assess compliance with standards and criteria for pre-operative haemoglobin optimisation before major surgery. Methods: This retrospective study examined clinical records of elective hysterectomy cases from January to September 2022 (pre-intervention) and June to October 2023 (post-intervention). Data was extracted from the Hospital Information System and analysed using Google Sheets. Exclusion criteria included emergency cases and patients with defective erythropoiesis. Standards included early detection (Target 100%) for Full Blood Count (≥ 4 weeks pre-surgery), investigation (Target 100%) for anaemia workup (Hb < 12.0 g/dl), and treatment (Target 60%) such as oral iron (≥ 1 month) or Intravenous (IV) iron (≥ 2 weeks pre-surgery). Results: Of the 96 cases analysed during the pre-interventional study, 61% achieved early detection. Anaemia was observed in 63% of these patients, with 32% undergoing anaemia workup. Timely treatment (49%) raised mean Hb from 8.9 to 10.6 g/dl. Suboptimal anaemia management was due to lack of awareness, increased workloads, and patient visits. Interventions included enhanced PBM awareness through courses and CME sessions, establishment of a pre-operative anaemia clinic, streamlined anaemia tests, and the introduction of new-generation IV Iron. The re-audit from June to October 2023, involving 69 patients, showed positive trends: early detection

increased to 74%, anaemia workup rose to 46%, and timely management improved to 69%. Discussion and Conclusion: This study demonstrated that enhanced knowledge sharing and enforcement of PBM practices preoperatively improved pre-operative anaemia optimisation. However, ongoing monitoring and surveillance are required to ensure sustained improvement in patient care through regular audits of PBM practices.

96. Adverse Transfusion Reaction in Hospital Shah Alam

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Introduction: Adverse transfusion reactions (ATR) are adverse events associated with the transfusion of blood products. It can occur during a transfusion (acute transfusion reactions), or days to weeks later (delayed transfusion reactions) and range in severity from minor to life-threatening. The diagnosis of transfusion reactions can be challenging when present with non-specific and often overlapping symptoms. The most common signs and symptoms include fever, chills, urticarial, and itching. Meanwhile, respiratory distress, high fever, hypotension, and haemoglobinuria may indicate a more serious reaction. Methods: Retrospective analysis of all reported transfusion reactions from 2019 until 2023. Descriptive analysis was carried out from gathered information. Results: Total of 228 transfusion reaction reports were received and only 194 were categorized as related to transfusion reaction from a total of 97,252 transfusions. Prevalence of transfusion reaction was 0.0012 (0.2%) from total blood transfusion. The most common transfusion reaction was febrile non haemolytic transfusion reaction (FNHTR) 48.4% followed by mild allergic reaction 44.3%. Patients aged between 21-30 years old had the highest rate among both genders. Female patients were more common than male patients. Most transfusion reactions were related with packed cell transfusion (89.2%). All ATR cases reported patient recovery with no ill effects. Discussion: Finding of ATR at Hospital Shah Alam (HAS) was consistent with international and national haemovigilance reporting. Continuous education and training are crucial to ensure ATR are recognised and managed accordingly.

DONOR AND BLOOD SUPPLY

97. Effectiveness of Whatsapp blast in promoting blood donor return

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Introduction: The use of WhatsApp applications has greatly increased over the past few years due to its easy accessibility and cost-effectiveness. One feature it includes is “WhatsApp blast” which refers to a mass messaging or broadcasting feature where a single message can be sent to multiple recipients simultaneously. The objective is to study the efficacy of a “WhatsApp blast” in influencing blood donor return. Data collections of respondents to “WhatsApp blast” in 2024. The study was carried out by sending a “WhatsApp blast” message to a total of 310 blood donors from Mac until May 2024. Discussion: The study yielded promising results, with 74 (23.87%) of donors responding to WhatsApp messages and donating blood. Men showed a higher response rate of 64 (28.19%) compared to women 10 (12.05%). The age group of 40-54 years old showed the highest response rate 34 (30.09%) followed by the age group of >54years old 4(26.67%). The occupation category with the highest response rate is from Private Sector with a number of 22 (34.92%) whereby the lowest response rate is from unemployed respondents 3 (9.68%). Out of the 74 respondents, 65(87.84%) of them are eligible to donate blood whereas 9 (12.16%) of them are not eligible. Out of 74 respondents who returned, 32(43.08%) of them returned in 2-4 weeks after receiving a “WhatsApp blast” message, whereas 28(35.38%) returned after a month. WhatsApp blast is a highly effective communication tool that has a wide reach in sending messages to a large audience instantly, compared to traditional communication methods. With proper strategies targeting the right group of donors, WhatsApp blast can provide crucial assistance in donor recruitment and retention.

98. Clinical audit on the management of anaemic blood donors in Hospital Seberang Jaya, Pulau Pinang

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Introduction: Anaemia appears to be one of the most common reasons for donor deferral worldwide. In Hospital Seberang Jaya (HSJ), low haemoglobin levels accounted for 6-8% of total donor deferrals every year. In order to ensure early diagnosis and appropriate management of anaemia, in April 2024, Transfusion Medicine Unit has developed a new Standard Operating Procedure (SOP) on management of anaemia among blood donors in HSJ. Following that, a clinical audit has been conducted and the aim of the audit is to ensure compliance to the SOP. Material and method: This is a prospective observational study conducted in in Transfusion Medicine Unit, HSJ. Donor Questionnaire Forms (DQF) belongs to each anaemic blood donors from 1st May 2024 to 31st August 2024 are reviewed. All anaemic donors should be managed according to the SOP and it should be clearly documented on DQF of the donors. Data on management of anaemic donors were collected using data collection form and subsequently analysed accordingly. Results: From 1st May 2024 until 31st May 2024, there were total of 1391 donors turned up for blood donation. Out of that, 103 donors (7.4%) were deferred due to low haemoglobin level. From the data obtained, we observed 100% compliance to management of anaemic blood donors in our centre. However, as this study is still ongoing, we will continue the audit until the

end of August 2024 to observe trends of practice. Discussion: In HSJ, every year, about 6-8% of donors are deferred due to low haemoglobin level. As this resulted in significant loss of eligible blood donors, it also affected the efficiency of blood procurement activities and adequacy of our blood stock. In view of that, strategic planning is important to ensure anaemic donors are managed appropriately so that they are fit to donate blood again. Subsequently, the efficiency of blood procurement activities can be improved and adequacy of blood stock can be preserved. As part of strategic planning for donor retention, we developed a new SOP on management of anaemic blood donors in our centre. This is important to ensure anaemia is managed early and appropriately to protect donor's health and wellbeing. Following the development of the new SOP, training and CME sessions has been conducted to all staff to enlighten them on the new SOP. A clinical audit has been conducted to ensure that all anaemic blood donors are managed appropriately according to SOP. From the audit findings conducted in May 2024, we observed 100% compliance rate on management of anaemic blood donors in our centre. We hope the 100% compliance rate towards this SOP can be maintained at all time for the benefit of our donors and Blood Transfusion Service.

99. Lapsed donor: Are they safe to resume blood donation

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Introduction: Safe blood comes from safe donors. In order to reduce risk of blood recipients, initiatives have been implemented to raise donor awareness, evaluate potential risks of transfusion-transmitted infections (TTI), and rigid TTI screening. Objective: To identify the frequency and incident of lapsed donors becoming seropositive for transfusion-transmitted infection in NBC between 2020-2023. Method: This is a descriptive analysis; data of lapse donors were retrieved from Blood Bank Information System Version 2 between 2020-2023 and analysed to understand the type of highest reactive screening, gender, age and ethnicity. Result: Data was analysed and revealed that 0.25% (2020), 0.24% (2021), 0.14% (2022) and 0.1% (2023) of lapse donors were seropositive donors. The highest percentage was contributed in 2020 with ratio of 3.38 per 1000 donors with the highest contributing age was 21–30 years old, whereas in 2021 pattern of age was 31 – 40 years old. About 80% of male donor contributed substantial percentage for gender distribution. The largest prevailing population belongs to Malay ethnicity thus the outcome of this study also revealed the same. The frequency of TTI revealed that syphilis presented the highest in 2021 compared to HIV in 2020. Further analysis revealed donors who donated in mobile settings presented with increased percentage among seropositive donor. Discussion: NBC experienced increasing numbers of lapse donor for the past few years with evidential raise of TTI. Concurrent with this endeavour to augment the safety of blood transfusion services, blood exhibiting positive TTI markers is discarded, and potential donors will be investigated and deferred. However, this process can be prevented if the risk of potential lapsed donor pattern is determined clearly. Conclusion: In view of the scarcity of data on this area in Malaysia, it is crucial to determine the need of reevaluating and accepting donors in this category for donation.

100. Harnessing Tawau's estates: A potential boost in blood collection for Tawau hospital

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Background: Tawau Hospital, a crucial healthcare provider on Sabah's East Coast, is expanding to meet escalating healthcare demands, increasing its capacity from 431 to 585 beds by 2025. As the hospital expands, the demand for blood intensifies. Current mobile blood drives primarily focus on urban areas, often neglecting the resource-rich estates surrounding Tawau. Objective: This study evaluates the contributions of blood collection from Tawau's estates to the hospital's overall blood supply from August 2019 to June 2024 and explores optimisation strategies. Methods: We conducted a retrospective analysis of blood collection data from estates compared with the total blood supply to Tawau Hospital over the study period. This analysis aimed to quantify the estates'; impact on meeting the hospital's blood needs. Results: Estate contributions to the total blood collection showed notable variability, peaking at 25.86% in late 2019, then dropping to a low of 3.83% in 2021 during the COVID-19 pandemic, and partially recovering to 17.97% in 2023. This trend indicates significant fluctuations influenced by the COVID-19 pandemic but also demonstrates a resilient potential for recovery and sustained contribution post-pandemic. Discussion: The estates in Tawau represent a valuable but underutilised resource for enhancing Tawau Hospital's blood collection. The COVID-19 pandemic's impact underscores the need for robust strategic partnerships and regular, targeted mobile blood donation drives. Implementing targeted interventions, such as awareness campaigns, frequent mobile drives, and partnerships with estate management, could maximise these contributions, crucial for the hospital as it approaches its expansion goals. Conclusion: The fluctuating yet significant contributions from Tawau's estates highlight their untapped potential as a critical resource for bolstering Tawau Hospital's blood collection, necessitating enhanced strategic efforts and community engagement to meet future healthcare demands efficiently.

101. Now or Never: Are we ready to take the next step?

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Introduction: Blood transfusion service has evolved with new developments. Yet there has been one challenge still lingering till date. Large contributor of deferral globally has consistently been low haemoglobin levels. Donors not meeting the required

level of haemoglobin is a reason for over two-quarters of NBC's temporary donor deferrals. These contributes to a glaring loss of blood donor requiring attention. Objective: Aim of this study is to analyse low haemoglobin level to improve NBC strategies in improving deferrals due to low haemoglobin and retaining blood donors. Methods: A retrospective analysis was conducted at NBC, data obtained from Blood Bank Information System Version 2.0. Low haemoglobin blood donors from 1st January to 31st December 2022. Descriptive presentation of data includes age, gender, and haemoglobin level. Results: 60,950 (22.7%) blood donors were deferred for various reasons in NBC. 30,024 (49.2%) deferrals were low haemoglobin levels of which 26,094 (87%) were female donors and 3930 (13%) male donors. Besides, 15% of donors have been deferred twice within the same year for this low haemoglobin levels. With 11,729 (49%) and 8724 (39%) donors, respectively, the age categories of 21–30 and 31–40 years old had the highest percentage of donors. In addition, range of low haemoglobin deferral was 11.6 g/dL to 12.4 g/dL (49.2%). Discussion: Outcome of this study reflects pattern of low haemoglobin among donors and this crucial to mitigate its impact. As Malaysia is working towards achieving 3.5% of every 1000 population as donors, this imposes large hindrance. Furthermore, age and the range of haemoglobin are of the crucial pool of donors. Although education and awareness about low haemoglobin has been implemented, alternative preventive methods advocating intervention prior and post-donation should be considered. Conclusion: as a way forward, investigations such as retic count should be introduced as preventive monitoring. Types of supplements given to donors best to be catered in accordance to its efficacy.

OTHER

102. Evaluating the safety of blood transfusion through lookback and recall investigations: A seven-year analysis of seroconverted recipient cases

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Introduction: Blood transfusion plays an essential role in managing various medical conditions effectively. However, it can lead to adverse transfusion reactions and increase the risk of transfusion-transmitted infections (TTIs). Hence, the National Blood Centre (NBC) has executed several measures, including mandatory serological screening for HIV, Hepatitis B, Hepatitis C and Syphilis, aiming to strengthen blood safety. The implementation of ID-NAT testing and stringent donor selection by trained healthcare personnel has significantly enhanced blood safety. Aims: The aim of this review is to ascertain the incidence of TTI among recipients who experienced seroconversion after receiving blood transfusions supplied by NBC between 2017 and 2023. Methods: This was a retrospective review of 7 years of data on seroconverted recipient cases in NBC. Data analysis encompassed infection types, recipient diagnoses, donor involvement, and results of fresh bleed tests, documented using Microsoft Excel. Results: From 2017 to 2023, a total of 23 seroconverted recipient cases were reported. The analysis conducted showed various diagnoses, which include 10 cases of ESRF (43.5%), 6 cases of haematological disorders (26.1%), and 7 cases of other diseases (30.4%). However, among these 23 recipients being investigated, only 14 (60.7%) had baseline negative infective screening. Hepatitis C was the most prevalent seroconversion, accounting for 43.5% (n = 10), followed by HIV at 30.4% (n = 7) and Hepatitis B at 26.1% (n = 6). No case of Syphilis seroconversion has been reported. Of the 254 donors that were investigated, 97.2% (n = 247) tested negative for the targeted infection, while the remaining donors did not show up for retesting. Conclusions: The review revealed no cases of TTI reported in NBC throughout the 7-year period. This showed that the NBC's protocols and procedures for maintaining blood safety are effective and successful in preventing transfusion-related infections among recipients.

RED CELL IMMUNOHAEMATOLOGY

103. Isohemagglutinin test in ABO blood group mismatched kidney transplant at National Blood Centre Kuala Lumpur

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Introduction: Kidney Transplantation (KT) is the best treatment option for patients who have reached the end stage of their kidney disease. However, a scarcity of donors has significantly curtailed this practice. In order to reduce waiting times and increase the donor pool, transplantation across ABO antibody barriers is one option that has been explored. In an ABO-incompatible kidney transplant, the ABO antigens are targeted not only by the resulting natural antibodies (IgM), but also by immune antibodies (IgG), which can rise dramatically in the hours or days following the transplant and lead to acute kidney injury (AKI). The isohaemagglutinin test (ABO titres) determination is a critical component used to monitor the antibody concentration spin phase (IS) for IgM antibodies and the indirect agglutination test (IAT) for IgG antibodies. For each assay, isohaemagglutinin titres was performed using serial double-fold dilution method according to a detailed standard operating procedure provided by MRIK, National Blood Centre Kuala Lumpur. Isohaemagglutinin titres for both IgM and IgG type ABO antibodies have to achieve ≤1: 16 on the day of kidney transplant surgery and continue monitoring after transplantation to maintain the titre level ≤1: 16 for two weeks post-transplant to perform a safe and good patient ABO mismatch kidney survival outcome. A high baseline of blood group titres will indicate that the patient needs to be desensitised to lower the antibodies prior to transfusion; and increased blood group titres in a few weeks after transplant may indicate rejection that require close observation and biopsy. The study may give a chance to improve the laboratory services in preparing the patients for ABO mismatch kidney transplantation and expand ABO-incompatible transplantation to more transplant centres, as well as to increase the number of kidney transplants performed using ABO-incompatible donors.