Special Issue

J. of Biomed. & Clin Sci.
Vol 9, No 1 (2024) Special Issue (Feb 2024)

TRANSFUSION MEDICINE UPDATE: ASIAN PACIFIC SYMPOSIUM (TMUAPS) 2024

Grand Riverview Hotel, Kota Bharu, Kelantan
Malaysia

6th - 7th January 2024

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APS-TU01: Does Interference Occur in Lipemic Samples When Conducting Immunohematology Tests?

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Introduction

Serum quality is crucial for accurate interpretations and providing compatible blood products for transfusions. Adhering to stringent blood banking standards is vital, and lipemic samples, often rejected due to their impact on laboratory testing, warrant attention.

Case Report

This is a case of 9-year-old Malay girl with type 2 diabetes mellitus who missed her oral medication (metformin) for a year. She presented to the emergency department after experiencing a syncopal episode, preceded by symptoms of hyperglycemia which then diagnosed with Hyperosmolar Hyperglycaemic State (HHS). On admission, her haemoglobin (Hb) level at 10.6 g/dL, a packed cell transfusion was deemed necessary. The blood group screen hold (GSH), however, was rejected twice due to grossly lipemia. She had a triglyceride level of 9.20 mmol/L, and her cholesterol measured 7.30 mmol/L. Due to difficult blood sampling and the parent's reluctance for another blood draw, a second attempt was made for group and screen testing. Surprisingly, the patient's blood group was easily identified as B Rh (D) positive. Antibody screening yielded negative results, and a crossmatch with her sample was also compatible. Throughout her admission, she required only a single unit of packed cells.

Discussion

Triglycerides caused lipemic samples, impacting analytical assays through light scattering, volume displacement, and sample homogenization issues. While lipemia can affect spectroscopy-based Hb measurements, it usually doesn't impact red blood cell, white blood cell, and platelet counts (especially impedance-based). For blood grouping and antibody screening, automated devices prone for interference with lipemia compared to conventional tube test. Up to the present time, this case represents the first reported case of lipemic sample sent for group screen hold. A lipemic sample may be considered suitable for IH testing, and it might be necessary to review and potentially revise the rejection criteria.

Keywords: Lipemic sample, group screen hold, hyperosmolar hyperglycaemic state

"No conflict of interest."

APS-TU02: Implementing Coding System for Blood Requests in Transfusion Services – Sharing an Experience from a Teaching Hospital

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Introduction
The blood bank system is a crucial component of healthcare systems, requiring effective and direct management to ensure accuracy and efficiency. Currently, various blood transfusion request systems are in use globally including implementation of coding system. Although the coding system ensured the judicious used of blood components, however it can potentially cause a delay in supplying the blood component, especially in emergency situation as highlighted in this case report.

Case Report
The blood request coding system at Hospital Universiti Sains Malaysia Transfusion Service was initially introduced in 2017 and has undergone enhancements as of March 2023. These improvements are applicable to all requests for blood component transfusions made via phone calls. The upgraded codes now utilize a combination of few elements, representing the day, request timing, blood component type, volume of the blood component, and any specific requirements, such as the need for irradiated blood. Establishing this internal coding policy involves discussions with clinicians to ensure clear information on blood transfusion requests for effective patient management. However, challenges arise, where there was a reported case of delay in supplying the blood component for bleeding maternal case requiring urgent blood transfusion after office hour, which leads to patient morbidity. The delay is due to problems in reaching blood bank staff for code requests and a lack of awareness of massive transfusion protocol (MTP) activation.

Conclusion
In view of the limitations in accessing a robust network through phone calls and delays in reaching staff for code requests, resulting in extended waiting times and delayed blood product supply, the organization decided the internal coding system is not suitable for emergency cases requiring urgent blood transfusion. Furthermore, awareness of MTP activation should be emphasized in such a circumstance.

Keywords: Coding system, blood transfusion, emergency

"No conflict of interest."

APS-TU03: Cold Agglutinin Disease: Rare Cold Agglutinin Anti-i in Mycoplasma Infection

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Introduction
Cold agglutinin (CA) titre procedure performed in blood banking is important to distinguish the thermal amplitude and specificity of the cold-reactive antibody as it is clinically significance for the risk of in vivo haemolysis. *Mycoplasma pneumoniae* (*M. pneumoniae*) is a common cause of community acquired pneumonia and although most cases are mild, complications sometimes occur. One recognized complication of *M. pneumoniae* infection is CA haemolysis, typically manifesting as a mild and temporary haemolytic condition. The CAs are commonly anti-I specific IgM in *M.pneumoniae* and IgG or IgM with anti-i specificity in Ebstein Barr virus or cytomegalovirus infection.

Case Report
We present a case of cold autoimmune haemolytic anaemia (cold AIHA) associated with *M.pneumoniae* infection (IgM serology for *M.pneumoniae* was positive with titre of 1: 5120) in a 72-year-old male with underlying diabetes mellitus presented with angina symptoms. The mono-specific direct coomb's test was positive for IgG only with full blood picture showed anaemia with marked red blood cells (RBCs) agglutination which partially resolved upon implementation of pre-warm techniques, thrombocytopenia, and no obvious abnormal lymphoid cells. Haemolytic parameters; lactate dehydrogenase and indirect bilirubin were elevated. The CA titre test revealed that it was of anti-i specificity which react with cord blood group O RBCs at higher titre; 1:> 4096 and at lower titre (1:1024) with adult group O RBCs which rarely occur in *M.pneumoniae* infection.

Discussion
This unusual occurrence has shown us that the IgM anti-I prevalent specificity in *M. pneumoniae* infections may actually be the opposite. Blood banking staff and physicians treating patients with cold AIHA linked to *M. pneumoniae* infection should be aware of this information.

Keywords: Cold agglutinin titre, direct Coomb's test, Ig G anti-I, *mycoplasma pneumoniae* infection

"No conflict of interest."

APS-TU04: Near Miss Events in Blood Transfusion Practices: A Retrospective Study in Major Hospitals of Kedah, Malaysia

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Introduction
Transfusion errors, ranging from near misses to actual error, pose a significant threat to patient safety.

Objectives
This study investigates the incidence, causes, and associated factors of near miss events in major Kedah hospitals including Hospital Sultanah Bahiyah (HSB), Hospital Sultan Abdul Halim (HSAH), and Hospital Kulim (HK).

Methods
This retrospective cross-sectional study spanned five years, involving data collection from Group, Screen, and Hold (GSH) and Group and Crossmatch (GXM) tests submitted to the transfusion medicine unit in Kedah hospitals. Information on near miss events was sourced from Patient Safety Incident Reporting forms from the respective hospitals' transfusion medicine units. The collected data encompassed the causes and associated factors of the near miss events.

Results
Seventy-one near miss events were identified, with HSB reporting the highest incidence rate (19.5), followed by HSAH (12.1) and HK (6.7). The overall near miss rate per 100,000 test requests was 14.2, highlighting concerns in transfusion practices. Near miss events were categorized into clinical and laboratory errors, with clinical errors (69%), including mislabelling and specimen miscollection, dominating. The laboratory errors (31%), such as transcription errors and wrong blood issues, were also significant. Factors associated with near miss events included lack of supervision or monitoring (81.7%), group work among house officers (36.6%), fatigue or stress (22.5%), carelessness (19.7%), communication errors (16.9%), and lack of knowledge/skill and experience (8.5%).

Conclusion
This study underscores the need to address both clinical and laboratory aspects of blood transfusion processes, enhance supervision and monitoring practices, and implement measures to mitigate fatigue and stress. The findings provide valuable insights for hospitals to develop strategies aimed at achieving zero transfusion errors, ultimately bolstering patient safety in blood transfusion procedures.

Keywords: Near miss, transfusion error, clinical error, laboratory error

"There is no conflict of interest in this study."

APS-TU05: Implementation of Maximum Surgical Blood Ordering Schedule (MSBOS) in Obstetrics and Gynaecology Elective Surgery Following COVID-19 Outbreak

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Introduction
Blood stock mitigation is a strategy employed to maintain the blood inventory during the COVID-19 pandemic. The introduction of Maximum Surgical Ordering Blood Schedule (MSBOS) for elective surgery could potentially assist Obstetrics and Gynaecology (O&G) specialists in acquiring specific blood types, thereby preventing unnecessary blood requests that may result in the depletion of blood inventory, inefficiencies in time and financial resources.

Objective
The objective is to construct a MSBOS by analysing the transfusion probability in elective O&G procedures.

Methods
The retrospective analysis was conducted to identify all O&G elective operations performed in Hospital Universiti Sains Malaysia operation theatre over six months from January to June 2022. All operation records, blood ordering requests and total units of blood transfused were retrieved. The percentage of blood usage (transfusion probability, T%) was determined using the calculation of the total number of blood transfused divided by a total number of blood requested and multiplied by 100. A threshold of more than 30% was indicated for Group and crossmatch (GXM).

Results
Among a total of 388 O&G surgeries, 49 units of packed red cells were crossmatched, with only 23 units ultimately transfused. The overall crossmatch to transfusion ratio (CT ratio) was 2.1 : 1 and the blood usage was only 46.9%. The transfusion probability (T%) was notably highest in transabdominal hysterectomy bilateral salpingoophorectomy (TAHBSO) at 74.2%, followed by myomectomy, hysteroscopic fibroid removal, and tumour debulking (66.7%, 60%, and 40% respectively), all warranting GXM. In contrast, the T% for elective caesarean section (ELLSCS) was a mere 22.7%, suggesting that it applied exclusively to Group, Screen and Hold (GSH), which indicated the over-ordering situation for ELLSCS.

Conclusion
The adoption and implementation of the MSBOS emerge as a crucial strategy with the potential to curb the issue of over-ordering significantly, consequently mitigating the risk of unnecessary blood supply delays.

Keywords: MSBOS, elective surgery, blood request, GSH, GXM

"*There is no conflict of interest.*"

APS-TU06: A Series of Falsely Sero-Reactive Hepatitis B Donors

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Introduction
According to the Ministry of Health Malaysia's Transfusion Practice Guideline (4th edition, 2016), individuals who recently received recombinant virus hepatitis B vaccines should postpone blood donation for 48 hours, while with live attenuated HBV vaccines should defer donation for 14 days. This precautionary measure is implemented to avoid the possibility of these vaccinated individuals testing positive for HBsAg, which could lead to falsely seroreactivity donors.

Case Report
We present the cases of six voluntary blood donors who contributed on the same day at a mobile blood donation unit. The donors, university students aged 18-21, were found to have HBsAg-positive results during screening. The recorded optical density (OD) ranged from 1.81 to 4.43, with confirmatory tests also indicating positivity for HBsAg. However, their NAT results were negative. These donors were undergoing their initial fresh bleed from the body, and based on their medical history, it was revealed that they had received a Hepatitis B vaccine (rDNA) forty-eight hours before the donation. None of the donor has history of high-risk behaviours, clinical hepatitis, or history of jaundice Subsequent tests for HBsAg and NAT remained negative, and they were advised to undergo anti-HbS testing and anti HbCore testing for further confirmation.

Discussion
Based on study conducted by Otag et al, it was observed that individuals who received the hepatitis B vaccine could exhibit detectable Hepatitis B surface antigen within 24 to 72 hours post-vaccination, indicating a transient surface antigenemia. This has implications for blood donation, emphasizing the risk of misdiagnosis that could lead to the erroneous exclusion of healthy individuals as blood donors, under the mistaken belief of a Hepatitis B infection. Therefore, caution is warranted to prevent such misdiagnoses and the unwarranted permanent disqualification of healthy individuals from blood donation.

Keywords: Sero-reactive donors, hepatitis B vaccine, false positive

"*There is no conflict of interest.*"

APS-TU07: When You Are Your Own Saviour: First Bombay Phenotype in Hospital Enche' Besar Hajjah Khalsom, Kluang Johor

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Introduction
Bombay phenotype is a rare blood group and managing individuals with Bombay phenotype plan for major surgery are often challenging. The Bombay blood group refers to inheritance of molecular defect which involves the FUT1 (H gene) and FUT2 (Se gene) giving a genotype of hh,se/se, thus results in failure of ABH antigen expression on red cells and secretions.

Case Report
We report a case of a 31-year-old Indian male with history of fall from height and sustained multiple closed fractures of radius and humerus; and burst fracture of lumbar spine. He was planned for multiple surgical interventions. Group, screen and hold was requested. Forward grouping showed no agglutination with both anti-A and anti-B reagents. Reverse grouping showed reactivity against B, A1 and O cells. All panels of screening cells showed strong reactivity. Sample sent to referral center for confirmation. Anti H was detected, and supported by undetectable A, B and H substances/antigens from Secretor studies and Absorption Elution test. In view of the rareness of his blood phenotype, his parents and siblings were screened for any possibility of becoming a donor. None of his family members sharing similar phenotype. His father is O Rh-positive while his mother and all four siblings are A Rh-positive blood group. Patient Blood Management (PBM) strategies was implemented. Without any compatible allogenic blood, pre-deposit autologous donation was carried out with supplementation of an intravenous iron. Surgery was successful and uneventful without needs of blood transfusion.

Discussion
This case highlights the importance of reverse or serum grouping particularly O cell to suspect a Bombay phenotype in a district hospital with limited services as it usually mislabeled as O positive individual and illustrates the success of implementing evidence-based, multidisciplinary therapeutic PBM strategies in managing a surgical patient with an extremely rare blood group.

Keywords: Bombay phenotype, HEBHKm autologous donation

"No conflict of interest to be declared."

APS-TU08: Unveiling the Consequences: A Case Study on Delayed Detection of Anti-D Alloimmunization and Haemolytic Disease of the Newborn in the Current Pregnancy

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Introduction
Haemolytic Disease of the Fetus and Newborn (HDFN) often results from immune Anti-D antibodies, usually following sensitizing events such as blood transfusions or fetomaternal haemorrhages. This case report details a scenario in which an RhD-negative mother, who received antenatal and post-natal Anti-D Immunoglobulin (IgG) - RhoGAM prophylaxis, gave birth to a baby with HDFN due to immune Anti-D antibodies.

Case Report
A 41-year-old woman, in her second pregnancy, arrived in early labour at 38 weeks. Her blood type was A RhD-negative, while her husband and first child had AB RhD-positive blood. There was no history of blood transfusion or miscarriage. She had received antenatal and postnatal IM RhoGAM during her previous pregnancy. No prior antibody screening records were available. During her current pregnancy, she received a single IM RhoGAM dose at 32 weeks. Pre-delivery tests indicated her blood type as A RhD-negative, with a positive alloantibody, Anti-D, titre 1:256. Her red cell phenotype was ccee (rr), and the Direct Coombs Test (DCT) was negative. Unaware of the potential Anti-D antibody formation, obstetricians administered IM RhoGAM post-delivery. The mother delivered a healthy full-term baby boy with Apgar scores of 8/9. The baby's blood type was A RhD-positive, red cell phenotype ccDEe (R2r). DCT showed a positive result (IgG: 3+, C3d: Negative). An elution study confirmed Anti-D presence with a titre of 1:16. The baby developed clinical jaundice, particularly in the facial region, with a total serum bilirubin level of 311 mg/dL within two days. He received phototherapy and was later discharged in a stable condition.

Discussion
Despite receiving recommended IM RhoGAM prophylaxis, the mother developed immune Anti-D antibodies, likely due to an anamnestic response from prior RhD antigen exposure during previous pregnancies or sensitizing events. These antibodies initially went undetected but increased rapidly in strength during this pregnancy. It is highly recommended for her to monitor the Anti-D antibody titre and closely monitor fetal well-being in future pregnancies to reduce the risk of HDFN.

Keywords: Rhesus D negative, haemolytic disease of the fetus and newborn, anti-D alloantibody

"No conflict of interest to be declared."

APS-TU09: Decoding the ABO Enigma: Unravelling Discrepancies in Grouping Across Diverse Automated and Manual Techniques – A Compelling Case Report

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Introduction
Pretransfusion testing is vital for safe transfusions. To cope with high workloads, automated blood grouping methods are used. In cases with no prior records, a two-method verification (automated and manual) is employed to prevent transfusion errors. This case report summarizes the management of discrepant blood grouping results between automated and manual methods.

Case Report
A 58-year-old male with multiple medical conditions required surgery for a descending colon tumour at Hospital Selayang. Packed cell units were required for the operation, prompting ABO group testing. The automated immunohematology analyser IH-500 initially identified the patient as blood group O RhD positive. Due to the lack of prior records, a confirmatory test using the conventional tube method was performed with Diagast anti-sera. A discrepancy emerged as the tube method showed mixed field agglutination for anti-A and anti-AB in forward grouping, with cell A having a 3+ reaction and cell B a 4+ reaction in reverse grouping. To resolve the discrepancy, tube method was conducted by using Nova Clone anti-sera, yielding results consistent with the IH-500 analyser. Further testing with anti-H lectin give positive results with a 4+ reaction strength, but the anti-A1 lectin was invalidated due to a positive direct coombs test. The sample was crossmatched with 4 units A RhD positive but they were all incompatible. The patient's sample was sent to the National Blood Centre, Kuala Lumpur (PDN, KL) for ABO confirmation. RBC genotyping displayed O1vO1v alleles which confirmed the patient's ABO phenotype to be O RhD positive. Subsequently, the sample was crossmatched with 4 units O RhD positive and they were all compatible enabling an uneventful blood transfusion.

Discussion
This case was identified with the usage of two verification methods for patient with no previous record. Discrepant results between the automated and conventional manual method were resolved by confirmation via the third method comprising of anti-sera and crossmatch then molecular study at the PDN.

Keywords: Two-method verification, discrepant blood grouping, automated vs manual tube method

"No conflict of interest to be declared."

APS-TU10: To Err Is Human: Evaluating Incorrect Blood Component Transfused (IBCT) in a Tertiary Hospital in Malaysia

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Introduction
The transfusion process involves multiple steps and skills from staff of various departments. According to the National Haemovigilance Report 2018-2019: National Transfusion Medicine Service in Malaysia, in 2018 and 2019, the incidence of Incorrect Blood Component Transfused (IBCT) was less than 0.01% of the total number of blood components transfused.

Objective
This study aims to identify the cause of IBCT in our centre, Hospital Raja Permaisuri Bainun, its limitations, and potential improvements to prevent further occurrence.

Methods
All IBCT that occurred at a tertiary hospital, Hospital Raja Permaisuri Bainun, between January to December 2022 were reviewed. Secondary data of all IBCTs reported to the Hospital Patient Safety Committee and National Hemovigilance Coordinate Centre (NHCC) were extracted.

Results
The incidence rate of IBCT in 2022 was 0.0215%, representing 4 out of 18,630 transfusions in our centre. Among these incidents, three occurred outside office hours, two involved patients from the Emergency Department and another two from the Medical Department. Error types reported include error in the blood bank laboratory (n=2) and error during blood administration (n=2), with a median of 200 mL erroneous product transfused to the patients. Two out of four cases suggested unfavourable patient outcomes including one death possibly related to transfusion error reported. Root Cause Analysis reported the most identified contributory factors were non-compliance to Standard Operating Procedure (SOP) (n=4), as well as a hectic working environment (n=3). Corrective and preventive measures were taken, including refresher courses that focused on safe transfusion practices and implementing a transfusion buddy system in the wards.

Conclusion
All preventive measures, including continuous education, regular reminders, assessment, and supervision of all personnel responsible for blood transfusion, should be vigorously emphasized. Periodic clinical audits on safe transfusion practice should be performed at clinical sites and laboratories to identify any noncompliance to the SOP and suggest relevant interventions to improve compliance.

Keywords: IBCT, Transfusion Error, Malaysia, ABO incompatibility

"There is no conflict of interest in this study."

APS-TU11: Relation of ABO Blood Group and Primary Immune Thrombocytopenia from a Single Centre Study

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Introduction
The relationship between ABO blood types and various diseases has been a subject of investigation since the early 1990s. Several studies show that genetically determined human ABO blood groups were correspondingly linked to an increased risk of infectious, circulatory, and autoimmune diseases. The aim of this study is to determine the relationship between ABO blood types and their correlation with primary immune thrombocytopenia (pITP), as well as haematological parameters at the time of diagnosis.

Methods
This study included 66 patients with pITP who were diagnosed at our institution and 114 blood donors. Basic demographic background information (e.g., gender and age) was recorded, and their blood sample was subjected to clinical laboratory. The blood group frequencies and haematological parameters (e.g., white blood cell (WBC) count, haemoglobin (HB) count, and platelet (PLT) count) were analysed. A p-value <0.05 is considered significant.

Results
In the pITP group, 21 (31.8%) were males and 45 (68.2%) were females, with a median age of 41.0 (interquartile range, IQR: 33.8-58.0). The frequencies of ABO blood types A, B, AB, and O were 23 (34.9%), 11 (16.7%), 6 (9.1%), and 26 (39.4%), respectively. In the control group, 20 (17.5%) were males and 94 (82.5%) were females, with a median age of 29.0 (IQR: 22.0-45.3). The frequencies of ABO blood types A, B, AB, and O were 25 (21.9%), 31 (27.2%), 12 (10.5%), and 46 (40.4%), respectively. Statistically significant were observed in terms of gender (p=0.028), WBC (p=0.010), and age, HB, and PLT (p<0.001). These findings demonstrate that there was no statistical significance in the pITP-control, gender-stratification, and haematological-stratification analyses. Thus, there is no evidence to suggest a relation between ABO blood group and pITP.

Conclusion
This study demonstrates consistent findings with both local and global studies, confirming that individuals of any blood type may be susceptible to developing pITP.

Keywords: ABO blood type, blood disorder, platelet count, thrombocyte

"The authors declare that there is no competing of interest."

APS-TU12: Transfusion-Related Acute Lung Injury (TRALI) Type 1 Triggered by Human Leukocyte Antigen (HLA) and Antibody Reaction: A Classical Case

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Introduction
Transfusion-related acute lung injury (TRALI) is a complication of blood transfusion when there is acute respiratory distress and noncardiogenic pulmonary edema associated with hypoxia during or within 6 hours of the transfusion of blood products. Chest radiograph shows bilateral infiltrates consistent with pulmonary edema. TRALI Type I occur in patients without risk factors for acute respiratory distress syndrome (ARDS), while TRALI Type II occur in patients with risk factors for ARDS or having mild ARDS. TRALI can be caused by Human Leukocyte Antigen (HLA) Class I, Class II or Human Neutrophil Antigen (HNA) in blood products against recipient antigen.

Case Report
36-year-old female, with no known medical illness was diagnosed with acute appendicitis and planned for laparoscopic appendicectomy. However, her baseline coagulation profile deranged with INR of 2.27 and 4 units of Fresh Frozen Plasma (FFP) was requested to correct coagulopathy. About 1 hour of transfusion, patient developed chills, rigor and oxygen desaturated to 88% under room air. She became tachycardic, tachypneic and feverish. Her chest radiograph showed bilateral pulmonary edema. She was then intubated and ventilated for respiratory distress and require inotropic support. Her condition improved and extubated after 29 hours of reaction and after 40 hours, she was able to wean off oxygen completely.

Discussion
Patient have no risk of ARDS and her symptoms fulfilled the diagnostic criteria of TRALI Type I. Pregnancy, transfusion or transplantation can induce production of leukocyte antibodies. One of the FFP received by the patient was from a female donor with a history of 5 pregnancies, while the other 3 were from male donors with no significant medical history. Thus, blood samples from the donor and recipient were collected and sent to the referral laboratory for TRALI investigations. HLA antibody screening for the female donor and HLA typing of the recipient were done. Multiple specific antibodies for HLA Class I and Class II was detected in the donor's blood and one of the HLA Class II antibodies is matched against the patient's HLA. Counselling done for the blood donor and she is permanently deferred as a prevention for another similar incidents.

Keywords: TRALI, HLA, FFP, transfusion reaction, female donor

"The authors have no conflict of interest to declare."

APS-TU13: Transfusion Related Multiple Alloantibodies and Autoantibody in a Patient – A Case Report from a Single Referral Centre in Malaysia

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Introduction

Blood transfusion is one of the most common procedures done for hospitalised patient. Although intended as life-saving measure, transfusions are not risk-free. One of the undesirable sequalae is transfusion associated red blood cell alloantibodies.

Case Report

A 42-years-old lady with underlying end-stage renal failure was admitted for upper limb cellulitis. She had a previous history of packed cell transfusion 4 months before her current admission with negative antibody screening. Full blood count showed moderate normochromic normocytic anaemia with Hb of 7.2 g/dL. A blood sample was sent for group, screen and crossmatch. ABO and Rhesus grouping are suggestive of group O RhD positive. The direct antiglobulin test was positive with polyspecific AHG of 3+ and Anti IgG of 2+. The antibody screening with an indirect antiglobulin test was positive. Antibody identification showed panagglutination of variable strength and positive auto control of, 2+ while the eluate showed panagglutination. These findings were suggestive of presence of auto IgG and likely multiple alloantibodies. Differential alloadsorption were done using R1R1 (Jk (a+b-), K-), R1R1 (Jk (a-b+), K-), R2R2 (Jk (a+b-), K-) and rr (Jk (a+b-), K-) enzyme treated donor cells and confirmed the presence of Anti-E, Anti-c, Anti-Jkb and Anti-S. Rh phenotyping is suggestive of R1R1 and RBC phenotyping of ss, kk, MN, Jka positive and Jkb negative. Packed cells of group O RhD positive, R1R1, S and Jkb antigen negative, crossmatch compatible with autoadsorped plasma and crossmatched least incompatible with plain plasma were supplied and transfusion went uneventful.

Discussion

Alloantibodies can significantly cause difficulties in cross matching blood and complicate transfusion therapy. Some clinically significant antibodies are capable of causing adverse events following transfusion, such as haemolytic transfusion reaction. Thus, knowledge of such alloantibodies is compulsory for proper product selection to prevent morbidity and mortality to the patient.

Keywords: Alloantibodies, autoantibody, transfusion

"Conflict of interest: The authors declare no conflict of interest."

APS-TU14: Leukocytapheresis for the Treatment of Hyperleukocytosis Secondary to Acute Lymphoblastic Leukaemia in Paediatric Age Group

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Introduction
Hyperleukocytosis is defined as white blood cell count more than 100 x 10^9/L, commonly seen in Acute Lymphoblastic Leukaemia (ALL) and the incidence among the paediatric age group is 5-20% of cases. This study highlighted the safety and effectiveness of the leukocytapheresis procedure in a paediatric pre-B-ALL.

Case Report
A 14-year-old boy presented with nonspecific symptoms of generalised body aches and lethargy for 3 weeks. Symptoms progressed rapidly and he developed a fever and vomiting for 3 days. The child is pallor and had splenomegaly with shotty lymph nodes over bilateral inguinal region. Laboratory parameters revealed a high white cell count of 954.2x10^9/L, with lymphocytosis (80.2%), haemoglobin is 4.9 g/dL, platelet is 44x10^9/L. Full blood picture showed hyperleukocytosis with numerous blast cells of more than 90%, normocytic normochromic anaemia and thrombocytopenia. Peripheral blood immunophenotyping report consistent with pre B-ALL, and leukaemia translocation studies showed positive for t(9;22)(q34;q11) with BCR-ABL1 fusion gene. Child started on induction chemotherapy and was later subjected to leukocytapheresis on Day 3 of hospitalisation to obtain rapid reduction of circulating blast count. However, leukocytapheresis was done only for 2 days with no significant reduction of leukocytes and he developed right brachial artery thrombosis. Treatment with chemotherapy escalated but he deteriorated further as he developed multiple intraparenchymal bleeds (ICB) suggesting leukostasis complication. Finally, he succumbed to death on Day 14 of hospitalisation due to ICB.

Discussion
Hyperleukocytosis is associated with high morbidity and mortality due to leukostasis, tumour lysis syndrome and disseminated intravascular coagulation. Although treatment with leukocytapheresis in paediatrics acute leukaemias is controversial, it is considered safe if conducted according to the protocol and guidelines. However, the decision to perform leukocytapheresis should not delay the definitive treatment with chemotherapy, especially in massive hyperleukocytosis with symptomatic leukostasis cases.

Keywords: Leukocytapheresis, hyperleukocytosis, ALL, paediatric, leukostasis

"The authors have no conflicts of interest to declare."

APS-TU15: Preoperative Management in a Patient with Multiple Red Cell Alloantibodies Undergoing Elective Splenectomy: A Multidisciplinary Approach

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Introduction
Managing patients with multiple red cell alloantibodies planned for any elective surgery needs a multidisciplinary team (MDT) approach involving related departments. Implementation of Patient Blood Management (PBM) concept in such cases offers more options in blood management apart from the challenges in supplying antigen-negative red cells for transfusion. We report a case of suspected haematological malignancy requiring recurrent blood transfusion and planned for splenectomy.

Case Report
A case of 30-year-old Sarawakian gentleman, with no comorbid. He was referred from primary care to haematology for pancytopenia for investigations. The symptoms were palpitation, generalised lethargy, easily bruised and constitutional symptoms. He required multiple transfusions as supportive management since admission. CT imaging shows markedly enlarged spleen, measuring about 37.4 cm in length diagonally. Other investigations were inconclusive. Differential diagnosis was Splenic Lymphoma and Myeloproliferative Neoplasm (MPN). MDT meeting was carried out to discuss the best treatment modalities and splenectomy was planned to avoid further complications. Before operation, patient developed multiple alloantibodies from recurrent transfusion. Antibody Identification (ABI) done, detected anti-E, anti-c and anti-JKa. These antibodies-imposed challenge in blood banking practice to supply compatible blood and blood products. Thus, all effort must be made to supply antigen negative red cells instead of random units. PBM implementation preoperatively should be continued until the postoperative phase to improve patient outcome through the safe and rational use of red cells and components by minimising unnecessary exposure to blood products. Operation was uneventful with estimated blood loss about 4.5 litres. He was transfused with six pints Packed Cells, four units FFP, six units Cryoprecipitates, two units of Apheresis Platelets and 6 units Random Platelets.

Discussion
This case requires checking our phenotype blood inventory to look for the group-specific antigen-negative red cell units which were A positive, R1R1, and Jka-b+. Blood Bank Information System (BBIS) which launched in 2019 kept record of phenotype blood donors available in Malaysia is an advantage to find compatible blood for patient. Assuming blood inventory stock available was not phenotype yet, it will take us to crossmatch 100 donors to get 3 units of blood. PBM implementation in practice by MDT approach will improve patient outcomes.

Keywords: Multidisciplinary, PBM, multiple alloantibodies, splenectomy

"There is no conflict of interest in this study."

APS-TU16: A Case Study of Non-Immune Platelet Transfusion Refractoriness

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Introduction
Platelet transfusions are indicated to stop serious bleeding in trauma and surgical patients (therapeutic administration) or prevent bleeding in patients with thrombocytopenia or platelet dysfunction (prophylactic administration). The effectiveness of platelet transfusion is evaluated by measurement of platelet count and post-transfusion corrected count increment (CCI). When post-transfusion platelet count is lower than expected, platelet transfusion refractoriness (PTR) is suspected, which is an important issue especially in patients requiring frequent platelet transfusions.

Case Report
A 5-years-old girl who was initially admitted for varicella infection. She presented with severe thrombocytopenia during the admission. Hence, she was transfused with one unit of platelet apheresis, however the platelet count was not improving, hence platelet refractoriness was suspected. Then, she was transfused with another 3 unit of random platelet concentrate. Full blood count post one hour and 24-hour post transfusion of 2 consecutive occasions were taken. Corrected count increment (CCI) one hour post transfusion was 6.6 x 10^9/L, however her platelet count was not sustaining up to 24 hours. Otherwise, we took CCI one hour post transfusion for the second occasion showed 33 x 10^9/L. It showed more towards non-immune cause of platelet refractoriness. Hence, we conclude this is more of non-immune causes of platelet refractoriness which could be due to infection, bleeding, or drugs. If CCI one hour post transfusion is less than 5 x 10^9/L in 2 consecutive occasions, then platelet antibody should be suspected. The specialised test can only be done in National Blood Centre.

Discussion
PTR occurs in 30–70% of patients receiving transfusion due to various conditions of thrombocytopenia, with or without bleeding. The aetiology of PTR can be separated into non-immune and immune. Non-immune PTR is more frequent than immune PTR, accounting for about two-thirds of refractory cases. If non-immune PTR is not appropriately diagnosed and managed, the subsequent platelet transfusions can elevate the risk of alloantibody production, leading to immune PTR.

Keywords: Platelet transfusion; platelet count; platelet refractoriness; corrected count increment; non-immune cause

"No conflict of interest to be declared."

APS-TU17: Relationship Between Demographic Characteristics and Blood Transfusion Knowledge Among Healthcare Workers in a Tertiary Institution

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Introduction
Ensuring healthcare workers possess adequate knowledge of blood transfusion is crucial for enhancing the quality of transfusion services, ultimately influencing patient care and transfusion outcomes. With the escalating number of transfusions in hospitals, understanding the factors associated with healthcare workers' knowledge in this area becomes imperative.

Objective
To determine the relationship between the general knowledge of blood transfusion and demographic characteristics among clinical healthcare workers in Pusat Perubatan Pakar Universiti Teknologi MARA (PPUiTM) Sungai Buluh.

Methods
A cross-sectional study from June 2020 to January 2021 involved 103 healthcare professionals from PPUiTM Sungai Buloh. A self-administered questionnaire comprising demographic data and 10 questions on general knowledge of blood transfusion was used. Data analysis was performed using the Statistical Package for Social Sciences (SPSS) version 23, with ethical approval granted by the UiTM ethics committee.

Results
The study included 13 doctors, 85 nurses, and 5 medical assistants. Most respondents were between 31-34 years (32%), with the majority being women (82.5%). 35% of respondents (74.8%) received formal knowledge of blood transfusions while studying. During their employment, 77.7% had participated in a blood transfusion training session. Only 64.1% knew the organisation's written policy and procedure (PnP) for administering blood transfusions, and only 49.5% had reviewed the written PnP. The median respondents' general knowledge based on the demographic characteristics ranged from 6 to 10 points. Variables significantly associated with general knowledge included workplace, involvement in the blood transfusion process, and history of participation in the blood transfusion training program.

Conclusion
The study identified workplace, involvement in the blood transfusion process, and participation in the blood transfusion training program as significant factors associated with healthcare workers' general knowledge of blood transfusion in PPUiTM Sungai Buluh.

Keywords: Blood transfusion, knowledge, healthcare workers, hospital

APS-TU18: A Clinical Audit on GSH Request Practice at Northern Major District Hospital

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Introduction
Group, Screen & Hold (GSH) is recommended only for cases where there is a higher chance of requiring blood transfusion. For elective clinical procedure, GSH shall be requested in accordance to the locally established Maximum Surgical Blood Ordering Schedule (MSBOS) which is important to reduce unnecessary pre-operative blood order and allows more efficient management of blood.

Objectives
To identify the percentage of GSH conversion & transfusion rates, to determine adherence to standardized MSBOS criteria, and to determine non-adherence among departments.

Methods
This is a retrospective study conducted at Immunohematology (IH) Laboratory of Transfusion Medicine Unit, Hospital Sultan Abdul Halim. Data of GSH request in October 2022 was collected using Data Collection Sheet and was analysed using Microsoft Excell.

Results
Total of 1301 GSH requests were received in October 2022. Out of this, only 110(8.5%) were converted and all cases are listed in MSBOS. Out of 110 converted GSH, only 24(22%) transfused, 63(57%) not transfused, 21(19%) are antibody cases and 2(2%) are RH negative cases. Out of 1301 request received, only 713(55%) were listed in MSBOS and 588(45%) not listed in MSBOS. Out of 588 GSH request that were not listed in MSBOS, all were not even converted or transfused and 432 (73.5%) contributed by Obstetric & Gynecology followed by other department Orthopedic 118 (20.1%), Surgical 33(5.6%), Otorhinolaryngology (ORL) 2(0.3%), Oral Maxillofacial (OMF) 2(0.3%) and Medical 1(0.2%).

Conclusion
In summary, out of 1301 GSH request, only 8.5% were converted to GXM and out of this, only 22% transfused. 55% adhered to MSBOS criteria, whereas non-adherence rate was 45%. O&G department (73.5%) contributed the most numbers of non-adherences of GSH request to MSBOS. Need revision of MSBOS according to the current requirement by each department. Further study with larger total cases should be done.

Keywords: GSH, MSBOS

"There is no conflict of interest in this study."

APS-TU19: A Clinical Audit of Crossmatched: Transfusion Ratio (C: T Ratio) Performance in Obstetric and Gynecology Hospital Sultan Abdul Halim, Sungai Petani, Kedah

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Introduction
C:T ratio is a ratio of the number of red blood cells units cross-matched to the number of red blood cells units transfused. It is an indicator for appropriateness of blood ordering. A ratio > 2.5 reflects excessive ordering of blood cross matching tests, thus imposing inventory problems for blood banks, an increase in workload, cost and wastage.

Objectives
To identify C:T ratio performance of O&G, to determine percentage of transfusion rate, and to identify cases distribution of crossmatch and transfusion requests.

Methods
This is a retrospective study. Request of Grouping & Crossmatching (GXM) received in December 2022 was collected using Data Collection Sheet and analysed using Microsoft Excell. Safe O cases were excluded.

Results
A total of 217 units of GXM performed for O&G discipline in December 2022. Only 76(35%) transfused and 141(65%) were not transfused contributing to CT ratio of 2.9. In Obstetrics, total of 133 out of 217(61.29%) units cross-matched and only 37(28%) transfused while 96(72%) units not transfused. 116 out of 133(87.2%) units contributed by emergency cases with 36(13%) transfused and 80(87%) not transfused. For elective cases, 17 out of 133(12.8%) units, only 1(5%) transfused while 16(95%) not transfused. In Gynecology, a total of 84 units cross-matched, with only 39 (46%) units transfused and 45(54%) not transfused. 47 out of 84 (55.95%) units contributed by emergency cases with 26(55%) were transfused and 21(45%) not transfused. For elective cases, 37 out of 84(44.05%) units, only 13(55%) were transfused while 24(65%) not transfused.

Conclusion
In summary, C:T ratio performance of O&G was 2.9. Only 35% were transfused. 61.29% total crossmatched were from Obstetrics cases. Obstetric emergency cases (87.2%) contributed higher crossmatched request with only 13% transfused. Study with larger total cases should be done for further action of cases stratification.

Keywords: GXM, C:T ratio, O&G

"There is no conflict of interest in this study."

APS TU-20: ABO and RhD Blood Groups Frequency and Its Association with Chronic Liver Disease Patients in Kelantan, Malaysia

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Introduction
ABO and Rhesus D (RhD) blood groups have been linked to a variety of health condition, including infections, malignancies, thromboembolism, and cardiovascular disease. However, studies regarding the association of blood groups and chronic liver disease (CLD) are scarce.

Objective
This study is aimed to determine the association of ABO and RhD blood groups and CLD patients in our centre.

Methods
This case-control study involved 441 CLD (case) and 1210 non-CLD (control) patients treated at Hospital Universiti Sains Malaysia. The patients' clinical data (age, gender, cause of CLD) and laboratory data (ABO and RhD blood group) were retrieved from the blood bank information system and their medical records. The association of the blood group and CLD was analysed using multiple logistic regression, and a *p*-value of < 0.05 is considered significant.

Results
The mean age of CLD patients was 57.9 (SD ±12.1) years old, where the majority were within the 40-59 (43.8%) and ≥60 (48.5%) years of age. Most patients were male (65.1%) and Malay (92.1%). Viral hepatitis was the most common cause of CLD (62.1%), followed by metabolic liver disease (25.4%). Most patients belonged to the O and B blood groups, which were evenly distributed at 31.5% and 31.3%, respectively. 99.3% of patients were RhD-positive. When compared to patient with O blood group, the non-O blood group was found to be at a significant higher risk of developing CLD (adjusted OR = 1.65, *p*=0.027) after adjusted for age, race and gender. There was no association between CLD and the RhD blood group.

Conclusion
Most CLD patients were blood group O and B. The non-O blood group was significantly associated with an increased risk of developing CLD. However, the mechanism behind this association is not well understood and may involve complex interaction between genetic, environmental, and immunological factors that warrant further research.

Keywords: Chronic liver disease, ABO, RhD, blood group

"There is no conflict of interest in this study."

APS-TU21: The Role of Ret-He in Detection of Latent Iron Deficiency Among Regular Whole Blood Donors – A Single Institution Study

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Introduction
It is well-established that regular blood donations are the most pivotal factor affecting iron status among dedicated blood donors. Iron storage does not reflect in the routine monitoring of haemoglobin (Hb) level for blood donors. Hence, blood donors without sufficient iron stores may be allowed to donate blood, if their Hb level is within the required range. It is critical to protect blood donor's health to maintain recruitment and retention.

Objective
To identify the role of reticulocyte haemoglobin equivalent (Ret-He) in detection of latent iron deficiency (LID) among regular whole blood (WB) donors.

Methods
A cross-sectional study was carried out from August 2022 to December 2022 among eligible regular WB donors in Hospital Sultan Haji Ahmad Temerloh. We excluded those blood donors who were (i) postmenopausal women, (ii) on iron therapy, (iii) having combined LID and thalassaemia trait, or (iv) reactive donors. Full blood count (FBC) with reticulocyte analysis was performed using XN-1000 automated haematological analyser (Sysmex Corporation, Kobe, Japan). Whereas serum ferritin is measured using COBAS e601 automated chemistry analyser (Roche Diagnostic, Germany). The regular WB donors were categorised into normal and LID groups according to serum ferritin level based on WHO guidelines.

Results
Among 334 regular WB donors, 324 were categorised in the normal group and the remaining 10 blood donors were in LID group. No difference was observed between normal and LID groups for race and donation frequency. However, there were significant differences between normal and LID groups for age and gender (p-values of 0.014 and 0.031, respectively). The ferritin and Ret-He levels were significantly lower in the LID compared to the normal (p-values of <0.001 and 0.015, respectively).

Conclusion
Besides serum ferritin, Ret-He as one of the extended parameters in the FBC can be considered as a screening parameter to detect LID among regular WB donors.

Keywords: Ret-He, latent iron deficiency, regular whole blood donors, serum ferritin

APS-TU22: An Analysis on Causes of Blood Wastage in a Tertiary Teaching Hospital

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Introduction
Although blood components are precious resources, their wastage is still a problem in hospitals all over the world. Many factors contributed to blood product wastage. The reasons of discarded can help guide the development of quality assurance checks and policies aimed at reducing blood wastage.

Objective
The purpose of this study was to determine the rate and causes of wastage of blood and blood products in Hospital Universiti Sains Malaysia (USM).

Methods
A retrospective study was conducted in Hospital USM by extracting data on blood donations, blood components produced, and discarded of blood products from the laboratory information system (myTransfusi) from January to December 2022.The data were analysed in Statistical Package for Social Sciences (SPSS) version 20 (IBM Corporation, Armonk, NY). Seropositive blood products were excluded as it was not processed.

Results
A total of 29,517 blood components produced in 2022. In this study, 1,350 (4.6%) blood products were discarded. Fresh frozen plasma (FFP) was the highest blood component discarded 560 (41.4%), followed by whole blood (WB) 410 (30.3%), cryoprecipitate 286 (21.2%) and packed cells 52 (3.8%). Underweight bag, overweight bag, shelf-life expiration, lipaemic, blood bag breakage/leakage, RBC contamination, clotted and reserved to ward but not used or returned were among the reasons for discarded blood components. The common cause for discarded FFP was breakage/leakage (34.5%), whereas WB was due to underweight.

Conclusion
Interventions significantly contributed to reducing blood wastage, resulting in notable cost savings and preservation of the blood supply. Monitoring the frequency of blood product wastage as a quality indicator in blood banks enables timely detection of deviations from goals.

Keywords: Wastage, blood component

APS-TU23: A Case of Clinically Significant Lewis Antibodies in a Patient with Severe Anaemia

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Introduction

Lewis antibodies are naturally occurring antibodies that are typically IgM in nature and are clinically insignificant. Antibodies to Lewis blood group antigens frequently react at lower temperatures, however, on rare occasions, they may react at a higher temperature of 37^{o}C and produce haemolytic episodes.

Case Report

A 38-year-old man was admitted for symptomatic anaemia and even with multiple packed cells transfusions, his haemoglobin level was decreasing in trend. He had splenomegaly and his haemolytic workups were within normal limits except for lactate dehydrogenase. Both parents are thalassaemia carriers, and the younger sister, likely a Beta-Thalassaemia major, died at 17 years old. His blood group is B Rh(D) positive with phenotype of cDE/cDE (R2R2), Jk(a-b+), and Le(a-b-). He had clinically significant Lewis antibodies (anti-Lewis A and B), which were reactive at 37^{o}C. As the phenotyping was performed within three months of his most recent transfusion, the result was not valid. Therefore, genotyping was done, and the result was ccEE, Jk(a+b+), Fy(a+b+), MN, ss, and kk, which showed a discrepancy with the Kidd phenotype. In the ward, the patient was transfused with non-phenotyped packed cells. His haemoglobin level ranged from 2.9g/dL to 7.3g/dL. Patient was subsequently given phenotyped blood B/R2R2, with Le(a-b-) due to poor response to non-phenotyped matched blood. The highest haemoglobin level achieved was 9.2g/dL post phenotyped matched transfusion. He underwent a splenectomy, which went well and was discharged with haemoglobin level of 9.4g/dL.

Conclusion

The use of phenotyped blood seems to provide benefits to the patient, as haemoglobin levels were increasing while the splenectomy was carried out without any complications. It was observed that his antibody may have developed because of the consequences of his recent transfusion of non-phenotyped blood. To optimize the therapeutic transfusion benefit, all patients with clinically significant Lewis antibodies should receive antigen-negative blood.

Keywords: Lewis antigen, lewis antibody, severe anaemia

“The authors declared no conflict of interest.”

APS-TU24: False Declaration of High-Risk Behaviors among Confirmed Reactive Blood Donors in Hospital Seri Manjung from January 2020 – December 2022

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Introduction
Transfusion-transmitted infections (TTI) often arise from blood donations from donors with high-risk behaviors (HRB), such as multiple sex partners (MSP), prostitutes, men having sex with men (MSM) and IVDU. Despite pre-donation counseling and awareness, some donors still neglect to disclose their HRB.

Objective
The objectives of the study were to highlight the demography of confirmed reactive blood donors who falsely declared their HRB.

Methods
An observational study was conducted retrospectively on confirmed reactive donors who falsely declared their HRB in Hospital Seri Manjung between January 2020 to December 2022.

Results
Out of 43 confirmed reactive cases in the year 2020- 2022,12 donors (27.9%) had falsely declared their HRB. All these subjects were men. Types of HRB were MSP (41.7%), prostitutes (33.3%), IVDU (16.7%), and homosexuals (8.3%). Majority blood donors were aged between 21-40 (66.7%), and 33.3% of them were married.

Discussion
Blood donors falsely declared their HRB due to lack of awareness about the legal consequences and also considered past HRB as irrelevant. This could be due to the failure of the counsellors to emphasize the impact and legal action that can be taken. Time constraints and lack of privacy during large mobile operations might contribute to this issue.

Conclusion
False declaration of HRB can be prevented if blood donors are made aware of the impact of TTI to the patient and the consequent legal action that can be taken against them. Counselling sessions must be performed by trained counsellors with strict privacy to encourage blood donors to be truthful and to self-defer if they have been involved in HRB.

Keywords: False declaration, reactive donation, high-risk behaviour

APS-TU25: Prevalence of Iron Deficiency Anaemia (Using RBC Count and Mentzer Index) among Pre-operative Cardiac Surgery Patients in National Heart Institute, Kuala Lumpur

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Introduction
The National Heart Institute, Kuala Lumpur (IJN) serves as a national referral center for cardiac surgery. The prevalence of IDA among pre-operative cardiac surgery patients is still not well established. IDA is defined as anaemia caused by limited iron stores (either absolute or relative) which restrict erythropoiesis. Although traditionally diagnosed using ferritin and transferrin saturation (TSAT), IDA can be predicted using full blood count (FBC) parameters, namely Red Blood Cell count (RBC count) and Mentzer Index.

Objective
To determine the prevalence of IDA using RBC count and Mentzer Index (MI) as a predictor among elective pre-operative cardiac surgery patients in IJN.

Methods
This is a retrospective, cross-sectional study that reviewed pre-operative data (age, gender, ethnicity and FBC parameters). The FBC parameters were obtained using XN-1500 automated haematology analyzer (Sysmex Malaysia) which uses the principle of flow cytometry, hydrodynamic focusing and SLS-haemoglobin method. Mentzer Index is calculated by dividing MCV (fL) with RBC count ($x10^{12}$/L). The inclusion criteria were all elective cardiac surgery patients in IJN from January to June 2023 aged ≥ 18 years old. The exclusion criteria were incomplete data. Iron deficiency anaemia is defined as anaemic patients with RBC count <5 x 10^{12}/L and Mentzer Index >13. Data analysis was done for a total of 663 patients using IBM SPSS Statistics version 27.0.

Results & Discussion
The median Hb among the patients was 13.7g/dL (IQR: 11.5g/dL – 15.9g/dL).
The point prevalence of IDA was 155 (23.4%). Mild IDA was observed among 17.5% of the patients while 5.9% of patients had moderate IDA. No patient had severe IDA.
Descriptive analysis showed increasing IDA prevalence among older age patients and female gender. Meanwhile, lower IDA prevalence was observed among Chinese ethnicity. This could be linked to nutritional intake.

Conclusion
Prevalence of IDA among pre-operative cardiac surgery patients in IJN was 23.4%, with higher prevalence seen among patients of increasing age and the female gender, while the Chinese ethnicity showed lower prevalence.

Keywords: Iron deficiency anaemia, pre-operative, cardiac surgery, RBC Count, mentzer index

"The authors declared no conflict of interest."

APS-TU26: Occurrence of Autoanti-I in a Juvenile Myelomonocytic Leukemia (JMML) Child Presented with ABO Discrepancy

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Introduction
Some haematological malignancies may affect the expression of ABO, H, and I glycosyltransferases, thus altering red cell phenotypes. Autoanti-I sometimes presents in patients' plasma with haematological malignancy due to loss of I antigen and leftover of i antigen. Herein, we report a child with Juvenile Myelomonocytic Leukemia (JMML) who presented with ABO discrepancy in which cold agglutinin anti-I specificity was identified.

Case Report
A 2-year-old Malay boy with underlying Neurofibromatosis type I and newly diagnosed JMML. He required platelet transfusion due to thrombocytopenia. Otherwise, he has no history of blood transfusion or transplantation. Initial ABO grouping showed discrepancy between forward and reverse reaction in which forward grouping showed positive 4+ reaction with anti-A and double population with anti-B while in the reverse grouping, there was no reaction seen with A1 cells and B cells. Anti-D showed positive 4+ reaction. This ABO discrepancy was subsequently resolved after a prewarm technique and patient blood group was concluded as AB Rh D positive. Antibody screening was positive with positive autocontrol. Polyspecific DAT was positive with 3+ reaction for both monospecific IgG and C3d. Elution test was otherwise negative. Cold agglutinin test revealed anti-I specificity. However, the titer was not performed due to inadequate sample.

Discussion
Anti-I is commonly found in serum of many healthy individuals, which is benign, usually naturally occurring IgM and strongly reactive at 4 ° C with a titer of <64. Occasionally, benign autoanti-I may interfere with pretransfusion testing due to its wide thermal amplitude causing ABO discrepancy. Higher titers may agglutinate test cells at room temperature and bind complement, which can be detected in the antiglobulin test if polyspecific AHG is used. Therefore, avoiding room temperature testing and using monospecific anti-IgG AHG will help to eliminate detection of cold-reactive antibodies that may bind complement at lower temperatures.

Keywords: Autoanti-I, ABO discrepancy, hematological malignancy

"The authors declared no conflict of interest."

APS-TU27: A Retrospective Study on Febrile Transfusion Reactions in Hospital Tuanku Ja'afar, Seremban

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Introduction
Febrile transfusion reaction refers to an acute adverse effect occurring within 24 hours in association with transfusion alone. Possible etiologies are accumulation of cytokines in a cellular blood component or sensitization causing anti-leucocyte antibodies formation.

Objective
To analyse reported febrile transfusion reaction cases in Hospital Tuanku Ja'afar, Seremban.

Methods
This was a retrospective study conducted in 2023 from January until November using records from hemovigilance forms of reported transfusion reactions and BBIS version 2.0.

Results
A total of 36 cases were analysed from which 21(58.3%) contributed to FNHTR whereas remaining 15(41.7%) were unclassifiable complication of transfusion. Adult age group showed a significant percentage in both FNHTR(95.2%) and unclassifiable complication of transfusion(93.3%).Females revealed a greater percentage in FNHTR(90.5%) and unclassifiable complication of transfusion(66.7%).In addition, blood group O recipients were reported to have the highest percentage in both FNHTR(47.6%) and unclassifiable complication of transfusion(40%).Pertaining to cellular blood components, transfusion involving packed cells demonstrated a remarkable percentage for FNHTR(90.5%) and unclassifiable complication of transfusion (80%);in comparison with platelet whereby only 13.3% developed unclassifiable complication of transfusion and none contributed to FNHTR. Packed cells which are stored for more than 14 days also showed a greater percentage in FNHTR(63.2%) and unclassifiable complication of transfusion(58.3%).

Discussion
Adults and blood group O patients were the commonest recipient during this study period which makes them more susceptible to transfusion reactions besides underlying medical conditions. Alloimmunization as a result of history of pregnancy amongst females and supply of non-leucodepleted packed cells during our study interval also explains why febrile transfusion reactions were common in female gender and recipients who received packed cells in addition to those stored beyond 14 days.

Conclusion
All transfusion service facility should emphasize on potential risk factors associated with adverse transfusion reactions and implement prevention strategies accordingly such as usage of pre storage leucodepleted blood products that can reduce the incidence of febrile transfusion reactions.

Keywords: Febrile transfusion reaction, unclassifiable complication of transfusion, FNHTR

APS-TU28: Prevalence of Positive Direct Antiglobulin Test among Blood Donors in a Tertiary Collection Centre

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Introduction
In Malaysia, the safety of the blood supply heavily depends on voluntary, non-remunerated healthy donors. However, blood banks occasionally face challenges during the cross-matching process, particularly in the Anti-Human Globulin (AHG) phase. A notable cause of incompatibility is the presence of a positive Direct Anti-Globulin Test (DAT) among donors.

Objective
To determine the prevalence and associated factors, including socio-demographic characteristics, connective tissue disease, and immunohematology test results among donors with a positive direct anti-globulin test at a tertiary hospital in Perak.

Methods
This cross-sectional study analysed all instances of incompatibility due to positive DAT found in blood bags from April 2023 to September 2023 at the blood bank.

Results
In this period, 47 packed cell bags exhibited positive DAT results. Of these donors, 20 were female, with ages ranging from 19 to 59 years. The group comprised 10 new donors, 7 lapsed donors, and 30 regular donors, including 3 who had donated more than 30 times. Notably, 2 out of 3 regular donors tested negative upon repeated blood tests. Of the 47 donors, 22 returned for additional testing, with 1 showing positive connective tissue screening and the presence of auto-Anti C and auto-Anti e in the Elution test. Interestingly, 2 of the 47 bags were previously cross-matched compatible before another crossmatched incompatible episode. This finding suggests that the positive DAT in these blood bags could be indicative of storage lesions, possibly due to the uptake of abnormal proteins by red cells during storage.

Conclusion
Positive DAT in normal blood donors is associated with an increased risk of connective tissue disease, indicating the need for long-term follow-up for these individuals. Blood banks should implement stringent guidelines for maintaining the cold chain to prevent storage lesions. Additionally, establishing a standardized protocol for managing positive DAT cases is imperative for all blood banks.

Keywords: Direct antiglobulin test, blood, donor, storage lesion

"The authors declared no conflict of interest."

APS-TU29: Transfusion-related Acute Lung Injury (TRALI) Type I in Trauma Patient – A Case Report

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Introduction

TRALI is a severe and lethal adverse reaction of blood transfusion, characterized by rapid onset of lung injury and noncardiogenic pulmonary edema within 6 hours post transfusion. The incidence is reported less than 1% in Malaysia. Among the suggested mitigation strategies is exclusion of female donor plasma.

Case Report

We reported a case of 37 years old healthy male, stable, trauma patient sustained open fracture of radius and liver contusion. He was planned for surgery and administered plasma preoperatively for trauma induced coagulopathy. Urticaria reactions occurred 30 minutes post transfusion and resolved after intravenous steroid and antihistamine. 1 hour later, symptoms progressed to dyspnoea with desaturation down to 80% under room air. Lung auscultation revealed reduced air entry with fine crepitations. Oxygen therapy was immediately started up to VM60% and his SPO2 improved to 94%. Patient's blood gas showed respiratory failure while his chest x-ray revealed non cardiogenic pulmonary oedema. He was eventually intubated and required mechanical ventilation for 24 hours. During the period, patient successfully underwent surgery. He recovered well and was discharged on day 3 post surgery with no residual respiratory complications. He was treated as TRALI type 1 as patient had no pre-existing acute respiratory distress syndrome and multiple anti-human leucocyte antigen (HLA) type I and II were detected in one of the plasma donors.

Discussion

TRALI is caused by neutrophil-mediated pulmonary vascular damage from donor blood human neutrophil antigen (HNA) or HLA antibodies binding to recipient antigens. In this case, the implicated donor was multiparous woman and regular donor for several years. The incidence was only found in her recent donation, which may be explained by increased HLA-sensitization with her number of pregnancies. TRALI treatment mainly includes supportive management, however it may require invasive oxygen therapy and this may pose as burden to our healthcare.

Keywords: Transfusion related acute lung injury, TRALI type I, HLA antibodies

APS-TU30: Comparison of Haematological Parameter and Peripheral Blood Mononuclear Cell Proliferation Rate between Alloimmunized and Non-Alloimmunized Pregnant Women – A Preliminary Study

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Introduction
Red blood cell alloimmunization in pregnancy is a significant medical problem that can cause haemolytic disease of the fetus and newborn leading to neonatal morbidity and mortality.

Objective
To compare the haematological parameter and peripheral blood mononuclear cell (PBMC) proliferation rate between alloimmunized and non-alloimmunized pregnant women.

Methods
The haematological parameters including white blood cell (WBC), red blood cell (RBC), haemoglobin (Hb) and platelets (Plt) from 22 alloimmunized and 11 non-alloimmunized pregnant women were compared. PBMC from three anti-E alloimmunized and 3 non-alloimmunized pregnant women with similar Rh phenotype were stimulated with RHCE peptide and phytohaemagglutinin (PHA) for 24 hours. After 24 hours of incubation, the stimulation index (SI) was calculated. The independent T-test is used for statistical analysis and the p-value of <0.05 is considered significant.

Results
Alloimmunized women had slightly higher RBC and Hb levels but lower WBC and Plt levels compared to non-alloimmunized women, with mean RBC of 4.39×10^{12}/L ± 0.50 and 4.31×10^{12}/L ± 0.62, Hb of 12.05 g/dL ± 1.44 and 11.80 g/dL ± 1.40, WBC of 10.98×10^{9}/L ± 3.60 and 11.43×10^{9}/L ± 2.31, and Plt of 257.60×10^{9}/L ± 57.22 and 290.60×10^{9}/L ± 75.99, respectively. Isolated PBMC is slightly higher in alloimmunized samples compared to non-alloimmunized with a mean 1.70×10^{6}/mL ± 0.26 and 1.10×10^{6}/mL ± 0.06. After being stimulated with RHCE peptide and PHA, alloimmunized sample had slightly higher PMBC proliferation rates than non-alloimmunized. The mean SI for RHCE peptide was 1.2% ± 0.03 and 1.1% ± 0.03, while for PHA it was 1.3% ± 0.03 and 1.2% ± 0.01, respectively. However, the mean differences of parameters between two groups were not statistically significant ($p>0.05$).

Conclusion
This preliminary study found no significant differences in all parameters between alloimmunized and non-alloimmunized pregnant women. However, due to the small sample size, it may not represent the true population results and further study with a larger sample size is needed to produce more reliable results.

Keywords: Red blood cell alloimmunization, pregnancy, white blood cell, red blood cell, PMBC proliferation rate

"The authors declared no conflict of interest."

APS-TU31: A Rare Case of a Subgroup Detected in a Tertiary Care Centre

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Introduction
ABO discrepancies between forward and reverse blood grouping have indeed led to the discovery of rare blood groups worldwide. Subgroup of A comprises 1% of those discrepancies among A or AB blood group individuals. Hereby, we report a case of rare A Subgroup in our centre.

Case Report
A 56-year-old lady with no known medical illness was admitted with left bimalleolar fracture and ankle dislocation. She has no history of recent blood transfusion or transplantation. A GSH was sent prior to operation and ABO blood grouping performed by automated analyser IH-500 showed a discrepancy between forward and reverse grouping. Forward grouping showed a mixed-field reaction with anti-A, no agglutination with anti-B and 4+ reaction with anti-D while reverse grouping showed no reaction with A1 and 4+ reaction with B-cells. Further enhancement technique for both forward and reverse grouping by prolonging the incubation time at room temperature and at 4℃ with enzyme treated cells revealed similar findings. Therefore, A subgroup probable A3 was suspected. Further test done with anti-A1 lectin was negative while anti-H lectin showed 3+ reaction. Adsorption and elution study revealed presence of A and H antigen. Patient blood group was then concluded as A3 subgroup RhD positive.

Discussion
A greater concentration of H antigen is present on RBC of A subgroup individuals as H antigen is not fully converted to A antigen as seen in our patient. Secretor and molecular study play roles as alternatives for confirmation. Subgroup of A individuals can also develop anti-A1, reactive at 37℃ where transfusion should be performed using compatible A subgroup or O blood. Therefore, it is critical to resolve ABO discrepancies to prevent the ABO mismatch transfusion.

Keywords: A subgroup, ABO discrepancy, anti-H lectin, adsorption-elution test

"*There is no conflict of interest.*"

APS-TU32: Multiple Alloantibodies in a Primigravida Without Prior Sensitization Events: A Case Report

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Introduction
Pregnant women are prone to develop red cell alloimmunization, mostly due to previous transfusion or pregnancies. However, it is also possible among primigravida with no previous sensitization. Hereby, we report a case of primigravida with multiple alloantibodies detected at labour, possibly against paternal red cell antigen inherited by the fetus.

Case Report
A 31-year-old, G1P0 at 37-weeks of gestation with no previous sensitization events presented to our centre in labour. Her antenatal follow-up was done at a private centre. Antibody screening was not performed. Her antibody screening, one year ago was negative. For this current admission, her antibody screening was positive. Her blood group was A RhD positive with probable rhesus phenotype of R1R1 while DAT was negative. Further antibody identification detected multiple alloantibodies likely anti-Jka, anti-E and anti-c. Alloadsorption using R1R2 with Jk(a-b+) and R1R1 with Jk(a+b-) cells had indeed confirmed these antibodies. Patient's red cell phenotyping was Jka-Jkb+. Post-delivery at 32 hours-of-life, mild neonatal jaundice was noted in her baby with total serum-bilirubin of 168.6 umol/l, requiring phototherapy. Otherwise, no other investigations for haemolytic disease of fetus and newborn (HDFN) were sent. Baby and mother were subsequently discharged well.

Discussion
This report highlights the importance of antibody screening to be done in all pregnant women apart from a RHD-negative mother. Our patient has been identified at labour with multiple alloantibodies capable to cause HDFN. However, as antibody screening was not done antenatally, it remained undiagnosed. Patient had no prior sensitization events, probably these antibodies were developed during current pregnancy against fetal red cell antigen inherited from father, post feto-maternal hemorrhage. Rh and Jka antigens are well-developed in fetus/newborn, thus anti-E, anti-c and anti-Jka can cause mild to severe HDFN. In her subsequent pregnancies, patient must be followed-up closely and the titre of antibodies needs to be monitored.

Keywords: Primigravida, alloantibodies, antibody screening, alloadsorption

"*There are no conflicts of interest.*"

APS-TU33: Prevalence of Biologically False Reactive Transfusion Transmitted Infections Marker Results among Blood Donors in a Major District Hospital in Perak

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Introduction
Universal donor screening for the major transfusion-relevant viruses, hepatitis B virus (HBV), human immunodeficiency virus types 1 and 2 (HIV-1/2), hepatitis C virus (HCV) and Syphilis has contributed to the current very low risk of transmitting infectious diseases by transfusion.*Biological false reactive is the* terms that has been used to describe repeatedly reactive results on screening that do not confirm as positive upon confirmatory testing.

Objective
This study is done to determine the prevalence of Biologically False Reactive for Transfusion Transmitted Infections marker results among blood donors in a major district hospital in Perak.

Method
This is a retrospective cohort study where data were collected from manual records from the year of 2020 to 2022.

Results
The total number of blood donors from years 2020 to 2022 were 23,841. The rate of BFR was 2.9 per 1000 population. The results showed that BFR in Syphilis mostly occur among Malay females and within 30-40 years old, BFR in Hepatitis B was among Chinese females and within 20-30 years old, BFR Hepatitis C was among Malay males and within 20-30 years old and BFR HIV, was among the Malay females and within 20-30 years old. BFR results among blood donors can be due to immune-response related which include vaccinations such as influenza, rabies or HBV, acute recent infections with other agents, allergies, transplantation antigens or autoantibodies, cross-reactive IgM or IgG antibodies, heterophile or polyreactive antibodies and ventricular assistance devices and also passive transfer via immunoglobulin therapy include anti-HBs, anti-HBc or anti-HTLV.

Conclusion
The prevalence of BFR donors is the highest among Malay males and age group within 20-30 years old. The factors that can lead to a BFR donor and the prevalence should be taken into consideration during the pre-donation counselling and associated questions should be asked more specifically and precisely to aid in identifying donors.

Keywords: Biological false reactive, transfusion transmitted infections, blood donors, prevalence, transfusion

"The authors have no conflict of interest to declare."

APS-TU34: Can the Cytokine Profile According to ABO Blood Groups Be Related to Cardiovascular Disease Risk?

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Introduction
Although the Framingham Risk Score (FRS) is widely used for cardiovascular disease (CVD) risk assessment, its predictive accuracy has limitations. Inflammatory cytokines and blood groups have previously been associated with CVD in the general population.

Objective
This study explores the potential link between ABO blood groups, cytokines, and FRS scores in predicting CVD disease risk.

Methods
This cross-sectional prospective study was conducted among adults aged 30 years and above involving patients who attended medical follow-ups at the Family Medicine Specialist Clinic of Hospital Sultan Abdul Aziz Shah. The eligible respondents who fulfilled the study criteria were consented and stratified based on the validated Framingham score (FRS) for the Malaysian population. Fifty venous blood samples from each FRS group were subjected for ABO blood groups using the tube method, and serum cytokines measurement using the Luminex assay.

Results
The mean age of the respondents was 55.5 ± SD 15.5, with a female predominance (59.3%) and most Malays (86.0%). Serum tumour necrosis factor alfa (TNF-alpha) exhibited significant variation ($p < 0.001\%$) across different FRS scores, with median values of (0.0074, 0.0074, and 0.0159) ng/mL for low, moderate, and high FRS, respectively. Similarly, serum C-C motif ligand 2(CCL2) showed statistical significance ($p=0.005\%$) with varying FRS scores, displaying median values of (0.13, 0.15, and 0.18) ng/ml for low, moderate, and high FRS, respectively. However, no significant difference in the levels of both cytokines across individual ABO blood groups.

Conclusion
This study suggests a noteworthy association between serum TNF-alpha and CCL2 levels with different FRS scores, implying their potential relevance as biomarkers for CVD risk assessment. However, no significant correlation was found between these cytokines and individual ABO blood groups. These findings underscore the complexity of CVD risk factors and emphasize the need for comprehensive risk assessment strategies beyond traditional methods like the FRS.

Keywords: ABO blood group, cardiovascular disease, cytokines, framingham risk scores

"The authors have no conflict of interest to declare."

APS-TU35: The Profound Impact of Maternal Anti-D Alloantibody on Twin Haemolytic Disease of the Fetus and Newborn

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Introduction
The Rh system encompasses more than 50 antigens embedded into the membrane of red blood cells (RBCs), with the D antigen being the most significant. It was first described by Philip Levine and Rufus Stetson in 1939. Here, we report a twin case of anti-D alloantibody-induced haemolytic disease of the fetus and newborn (HDFN).

Case Report
A 37-year-old Chinese lady, Para 2+1, with A Rh(D) negative blood group had delivered her twins at 33 weeks and 4 days of gestation. She received Rh(D) immune globulin (RhIG) at 28 weeks of gestation but was unsure regarding RhIG status during previous pregnancy and miscarriage. Antibody screening was positive with the possible presence of anti-D alloantibody. Rhesus phenotype was dce/dce (rr). Her newborns were admitted to the Neonatal Intensive Care Unit due to prematurity.Twin 1 was intubated for acute respiratory distress at birth, jaundiced, and anaemic. Twin 2, was jaundiced and developed anaemia on day 13th of life. Haemolytic workups revealed increased reticulocyte count and positive direct Coomb's test with anti-IgG specificity. Twin 1 exhibited features of haemolysis, while Twin 2 showed no obvious haemolysis on peripheral blood film. Both twins had anti-D alloantibody present. They underwent intensive phototherapy and received O Rh(D) negative packed cell transfusions, with no exchange transfusions. Antibody screening remained positive up to day 35th of life. They were discharged well on day 48th of life.

Discussion
In the entire pregnant population, the prevalence of anti-D sensitised pregnancies is approximately 1 in 1000. RhD-negative women should receive RhIG for prophylaxis and potential sensitising events. If immune anti-D is detected, prophylaxis is no longer required. Haemolytic disease of the fetus and newborn is managed by phototherapy, blood transfusion, and exchange transfusion. A multidisciplinary approach (obstetrician, transfusionist, and neonatologist) is recommended perinatally.

Keywords: Haemolytic disease of fetus and newborn, Rh(D) alloimmunisation, Rh(D) immune globulin

“The authors report no conflicts of interest.”

APS-TU36: A Retrospective Study of Blood Donor Deferral among Students in a Teaching Hospital

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Introduction
Blood donor deferral is the temporary or permanent exemption of an individual from blood donation, implemented to protect the health and safety of blood donors and patients. Students are viewed as valuable potential blood donors because of their typically good health and their capacity to cultivate long-term donation habits.

Objective
This study aims to investigate the prevalence of blood donor deferrals among students and ascertain the specific types and causes behind deferrals among the student population.

Methods
This retrospective study focused on blood donor deferrals among students, involving the extraction of data from the laboratory information system (myTransfusi) from January 2022 to June 2023. The statistical analysis was conducted using Microsoft Excel and Statistical Package for Social Sciences (SPSS) version 26 (IBM Corporation, Armonk, NY).

Results
A total of 1766 students were involved with 1377 (77.97%) females and 389 (22.03%) males. A majority of the deferred blood donors were aged between 18 and 25 years old (97.17%) and first-time donors (73.95%). The most common causes of temporary deferral observed in our study were low haemoglobin (46.55%), upper respiratory tract infection (9.00%), and low body weight (7.93%). Additionally, most of permanent causes were encompassing medical issues like psychiatric disorders (0.34%) and bronchial asthma (0.28%), as well as engaging in high-risk behaviours (0.68%).

Conclusion
Our findings highlight the importance of addressing blood donor deferral among students by implementing specific initiatives to improve the eligibility criteria, raise awareness while navigating them for a long-term donation habit.

Keywords: Transfusion, deferral, blood donor, temporary causes

"The authors declare that there is no conflict of interest."

APS-TU37: Incompatible Red Cell Crossmatches Attributed to Wide Thermal Amplitude Anti-Le^{ab} Antibodies in a Patient with Rare Red Cell Phenotype

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Introduction

Anti-Le^{ab} are naturally occurring, rarely clinically significant IgM-type red cell antibodies produced by Le(a-b-) individuals. Here, we present a case of wide thermal range anti-Le^{ab} in a patient with moderately rare Fy(a-b+) phenotype causing difficulty in red cell crossmatching.

Case Report

A 46-year-old gentleman with myelofibrosis was admitted for having a haemoglobin level of 5.2 g/dl. His previous blood type records were O Rh(D) positive, CDe/cDE, kk, Jk(a+b+), and Fy(a-b+). He had a history of a pint red cells transfusion six days prior. Two pints of red cells were ordered. However, only 1 out of 18 units of O Rh(D) positive crossmatched was found compatible. ABO blood grouping showed O Rh(D) positive with 4+ reactions with O cells. Antibody screening was positive and the direct antiglobulin test (DAT) was positive with C3d specificity. Antibody identification showed wide thermal range anti-Le^{ab} reacting at 37°C with 1+ auto-control reaction. The patient's Lewis phenotype showed Le(a-b-). He was transfused with two crossmatch-compatible O Rh(D) positive Fy(a-b+) Le(a-b-) red cell units supplied by the Malaysian National Blood Centre without any complication.

Discussion

Lewis antibodies are capable of activating complement despite being regarded as benign and not reacting at 37°C. Lewis antibodies that show reaction at 37°C ex-vivo should be considered clinically significant and may cause haemolysis. There were few reported cases of haemolytic transfusion reactions caused by Lewis antibodies. However, the case of anti-Le^{ab} causing haemolytic transfusion reaction is still lacking, much less in a patient with moderately rare Fy(a-b+) phenotype that occurs in only 0.5% of the Malaysian population. It was believed that wide thermal amplitude anti-Le^{ab} caused incompatible crossmatches and reaction at reverse blood typing with O cells in this case. Therefore, it is important to test Lewis antibodies' reactivity at 37°C in parallel with auto-control to determine its clinical significance.

Keywords: Lewis antibodies, wide thermal, crossmatch

"The authors declare no conflict of interest."

APS-TU38: Regular Blood Donor with High Cold Agglutinin Titre Post COVID-19 Infection

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Introduction

Direct antiglobulin test (DAT) is a laboratory test that detects the presence of immunoglobulin and complement attached to the red blood cell membrane. DAT may be positive due to cardiolipin antibodies, medication, supplements, or cold agglutinin. High number of adults showed the presence of cold agglutinin without any disease or evidence of haemolysis. However, these antibody titres rarely exceed 1:256 and are normally below 1:64. The haemolysis degree is correlated to the circulating antibody titre and thermal amplitude of the cold agglutinins. Around 90% of cold agglutinins are anti-I specificity while others show specificity for anti-i.

Case Report

We report a 47-year-old healthy regular blood donor whose direct coomb's test turned positive on his seventeenth blood donation. He just had COVID-19 disease prior to the blood donation and was vaccinated with COVID-19 vaccine 2 weeks before the blood donation. Cold agglutinin was detected with significant antibody titre of 1:2048 at 4°C with anti-i specificity. Full blood picture showed marked agglutination which mildly improves upon the prewarm method. However, the patient remained asymptomatic and had no evidence of haemolysis. The repeated DAT remained positive after 1 year. The donor was deferred from blood donation permanently in view of persistent positive DAT and was referred to haematologist for further management.

Discussion

There are few reported cases that showed cold agglutinin disease is associated with COVID-19 infection and vaccine. This is possibly due to the mechanism of molecular mimicry, in which antibodies generated against the virus attack erythrocytes by cross- reactivity. The patient with cold agglutinin disease may remain asymptomatic despite high antibody titre due to low thermal amplitude. So far, there has been no reported case regarding development of cold agglutinin with anti-i specificity in patients with COVID-19. Further studies are needed for the correlation between anti-i and COVID-19 disease.

Keywords: Positive DAT, cold agglutinins, COVID-19, donor, anti-i

APS-TU39: Alloimmunisation in Infant Diagnosed with BetaThalassemia Major

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Introduction

Thalassemia is inherited abnormalities in synthesis of alpha and beta-globin chains, resulting from severe to clinically asymptomatic anemia. Individual with intermediate or severe Thalassemia necessitates regular blood transfusion as primary therapeutic approach. However, repeated exposure to red blood cell (RBC) antigens can lead to alloimmunization which not only reduce the lifespan of transfused RBCs but also restrict the availability of compatible blood.

Case Report

This is a case report of a seven-month-old infant girl born full term with uneventful antenatal and postnatal history. The infant's development is appropriate for age. Bothparents are carriers of Beta Thalassemia, with no family history of transfusion or closefamilial marriage. She was admitted due to severe anaemia with haemoglobin level of 4.0g/dL in early September 2023. Her blood group is A Rh(D) positive and was transfused four times in the same month. Her pre transfusion haemoglobin was ranging from 6.2g/dL to 7.6g/dL. Antibodies were detected on the 28th September 2023 when she was planned for another packed cell transfusion for symptomatic anaemia with haemoglobin level 6.9g/dL. Antibody identification revealed Anti-Jk^{a} and Anti-Le^{a}. Antigen negative blood was successfully transfused, resulting in the patient's positive progress. She was discharged with the diagnosis of Beta Thalassemia Major with alloimmune haemolytic anaemia.

Discussion

Despite advancement in compatibility testing, global data indicates that 4-50% of Transfusion Dependent Thalassemia (TDT) patients develop alloantibodies. Thisimpacts subsequent transfusion and limit option availability. Use of phenotypedmatched RBCs prevents further development of antibodies towards other antigens inboth alloimmunized and non-alloimmunized TDT patient. Hence routine red cell phenotyping should be done before transfusion was commenced. Molecular genotyping is the way forward whereby it enabled the determination of the actual antigen profile and facilitates the procurement of antigen-matched blood for TDT patient.

Keywords: Thalassemia, alloimmunisation, paediatric, antibody

"There is no conflict of interest in this study."

APS-TU40: Red Cell Alloantibody Incidence among Thalassaemia Patients in Hospital Dungun, Terengganu

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Introduction
Thalassaemia is a common inherited haemoglobin disorder in Malaysia, which requires regular pack red cell transfusions as one of the treatments for transfusion-dependant thalassemia. Although these transfusions are lifesaving, they may lead to complications such as red blood cell (RBC) alloantibodies formation.

Objective
This study aimed to determine the incidenceof RBC alloantibodies found in thalassemia patients during the pre-transfusion testing.

Methods
This was a cross-sectional study done in the transfusion unit of Hospital Dungun, utilizing data obtained from 2017 to 2023. The data was retrieved from the hospital laboratory information system.

Results
Out of 33 thalassaemia patients studied, 12 (36.4%) developed RBC alloantibodies, with some individuals developing single or multiple specificities. The most frequent alloantibodies were against Rh blood group systems.

Conclusion
The development of alloantibodies related to blood transfusions can create challenges in managing transfusion dependant thalassemia patients. It is advisable to incorporate extended-matched phenotyping into the care protocols to mitigate the risk of alloimmunization and minimize the chances of these patients developing blood transfusion- related alloantibodies.

Keywords: Alloantibody, blood transfusion, thalassemia, antibody specificity

"The authors declare that there is no conflict of interest."

APS-TU41: Profiling Seroconverted Blood Donors in Kelantan: 4 Years Data Analysis

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Introduction
Repeat blood donors may contribute to seroconversion despite their lower transmission risk. Seroconverted donors are those confirmed positive for a particular transfusion-transmitted infection (TTI) in their current donation but were previously negative. By linking the demographic and risk factors for seroconversion, we can better understand donor behaviours, improve donor counselling, and provide targeted group education.

Objectives
This study aims to determine the prevalence of seroconversion among repeat voluntary blood donors, their demographic features and risk factors contributing to seroconversion.

Methods
This is a cross-sectional study involving retrospective data retrieved from Blood Bank Information System Version 2.0 and Seroconvert Donor Case File, year 2020-2023 from all Ministry of Health hospitals in Kelantan, which was summarized and analyzed using Microsoft Office Access.

Results
Among 68,956 repeated donations, 0.129% seroconversion rate was reported (89 cases). The prevalence of seroconvert cases revealed an alarming gradual upward trend since 2021. Seroprevalence of Hepatitis B Virus (HBV) (0.046%) was the highest followed by Syphilis (0.041%), Human Immunodeficiency Virus (HIV) (0.035%), and Hepatitis C Virus (HCV) (0.019%). Data showed male, age 26-40 years old and lapsed donors contributed most in rate of seroconversion i.e. 96%, 49%, 83% respectively. Although occupation exhibited non-dominant results, it was noteworthy that many cases came from the category self-employed (n_{se}=24), student (n_s=15) and uniform body (n_{ub}=13). Sexual transmission is the most predominant risk factor for seroconversion elicited from donors, with top contribution (8 cases each) from self-employed and student category. High risk unprotected homo- and heterosexual activities with unknown partners are more at risk of seroconversion which accounted for 67% of risk factors successfully elicited.

Conclusion
This study aids Blood Procurement team to provide targeted donor education on TTI risk, high risk behaviours and safe sex practices. Reliable pre-donation counselling is crucial for screening high risk groups, and thus medical personnel shall be more vigilant in certain groups of repeated donors, ensuring stringent selection of safe donors being practiced.

Keywords: Transfusion transmitted infection, seroconversion, risk factor

"The authors declare that there is no conflict of interest."

APS-TU42: MNS Phenotype Frequencies in Melanau of Borneo

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Introduction
The MNS is the second blood group system recognized by the ISBT and has been reported to cause haemolytic transfusion reaction and haemolytic disease of the fetus and newborn (HDFN). There are more than 50 antigens belong to this blood group, including M, N, S and s. The M and N antigens are coded by the *GYPA* gene while S and s antigen expressed by the *GYPB* gene on chromosome 4. Frequency spectra of these alleles that determine MNS phenotypes distributed differently among populations and MNS population data are widely used for population genetic purposes and designing donor recruitment strategy.

Objective
To genotype *GYPA* and *GYPB* genes and to compile MNS blood group population data for the Melanau of Sarawak.

Methods
The presence of M, N, S and s alleles in 120 DNA samples obtained with written informed consent from healthy and unrelated Melanau individuals were detected using polymerase chain reaction with sequence-specific primer (PCR-SSP) technique.

Results
The most frequent MNS phenotypes in Melanau are M+N+S-s+ (21.7%) and followed by M+N+S+s+ (17.5%). In PC analysis, Melanau is plotted with other population groups in Peninsular Malaysia.

Conclusion
Frequencies of MNS blood group phenotypes for Melanau are more similar with population groups in southeast Asia than those in other geographical regions. This knowledge can be used for searching for donors with rare MNS phenotypes.

Keywords: MNS blood group, PCR-SSP, transfusion, alloimmunization, population

"The authors declare no conflict of interest."

APS-TU43: A Case of Anti-M Alloimmunisation Concurrent with Toxoplasmosis Induced Hydrops Fetalis in Pregnancy with Successful Intrauterine Transfusion (IUT)

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Introduction
Hydrops fetalis due to fetal anaemia is a relatively rare but serious condition. Its most common causes are maternal alloimmunisation and viral infection. Intrauterine transfusion (IUT) has resulted in excellent survival of anaemic fetuses.

Case Report
A 34-year-old primigravida Malay lady at 21 weeks POG, referred to our centre for management of hydrops fetalis. She had no known medical illness or transfusion. Blood specimen was sent to the Blood Transfusion Unit Laboratory for ABO Rh (D) grouping and antibody screening as part of the protocol for antenatal patient. Blood group is O Rh (D) Positive with presence of Allo Anti-M. Furthermore, several tests were performed to establish other causes and she was found to be Positive for Toxoplasmosis. However, she denied of any risk factors or past infection. Ultrasonography (USG) Doppler showed evidence of hydrops fetalis thus reflected that the fetus had severe anaemia. Post investigation and counselling, we proceeded with one session of Intrauterine Transfusion (IUT) with 31 ml fresh, irradiated, leucodepleted NN phenotype-matched O Rh (D) Negative Packed Cell. Anti-M titre and fetal well-being was assessed two-weekly by means of the Middle Cerebral Arterial Peak Systolic Velocity (MCA-PSV). The patient delivered a male baby weighing 2.59 kg at 35 weeks of gestation by Lower Segment Caesarean Section (LSCS). The IUT procedure had been successful in raising the fetal haemoglobin from 1.9 to 9.5 g/dL at the time of birth. The neonate was tested Positive for Toxoplasmosis and G6PD deficiency with symptomatic anaemia which required one-time Packed Cell transfusion. On Day 16 of life, the neonate was discharged home. This is the first IUT procedure performed in our centre and it was proven to be successful.

Discussion
A careful serological work-up, assessment of fetal well-being and early interventions are crucial in the management of hydrops fetalis to ensure good perinatal outcome.

Keywords: Toxoplasmosis, pregnancy, anti-M, intrauterine transfusion

"Conflict of interest: Authors declare no conflict of interest."

APS-TU44: Enough Blood at a Time, Keep the Little Heart Fine – An Update on Paediatric Cardiothoracic Surgeries MSBOS

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Introduction
From July 2023, Hospital Sultan Idris Shah, Serdang implemented a new MSBOS for Paediatric Cardiothoracic surgery. This MSBOS is divided into 5 categories: simple surgeries, other close heart surgeries, complex neonatal open-heart surgeries, other open-heart surgeries, and BT shunt.

Objective
To analyse the impact of MSBOS on the Crossmatch: Transfuse ratio (CTR) and for any adjustment in blood supply.

Methods
Paediatric Cardiothoracic OT list for July–November 2023. Periodic retrospective analysis of all paediatric cardiothoracic surgeries performed within 24 hours throughout a 5-month period (July 2023–November 2023). The data was obtained from elective and emergency operation lists, patients' medical records, and Health Information System (HIS). The data was analysed based on CTR (crossmatch: transfused), percentage of blood usage (transfused: crossmatch), and transfusion average (total transfused: total case).

Results
CTR average for packed cells shows improvement in 2023 at 1.77 compared to 2022 which was 6.0. As for pedipacked, the CTR average is 2.57 compared to 2022 which was 8.2. There is an increment in the percentage of transfused blood in most surgeries in 2023 in comparison to 2022. On average, 58.6 % of the blood is converted according to the latest MSBOS guideline used for the procedures.

Conclusion
The new MSBOS shows tremendous improvement in blood usage. However, minor adjustments for categories of complex neonatal open heart and BT shunt surgeries in units of blood supply.

Keywords: MSBOS, paediatric cardiothoracic, crossmatch: transfusion ratio (CTR), packed cells, pedipacked

"No conflict of interest."

APS-TU45: Transfusion Related Acute Lung Injury: Where Is the Hit?

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Introduction
Pulmonary complications of transfusion remain a leading cause of transfusion-related mortality and morbidity, contributing to more than 50% of transfusion-related deaths from 2013 to 2022 and there were 4 antibodies negative transfusion related acute lung injury (TRALI) cases reported in 2022, as stated in SHOT UK 2022. We report a case of TRALI Type II antibody negative in Hospital Tengku Ampuan Rahimah.

Case Report
A 65-year-old multiparous female with underlying type 2 diabetes mellitus, hypertension and dyslipidaemia was admitted for wound debridement of left diabetic foot ulcer and rays' amputation of left fifth toe. She received one unit of packed red cells transfusion as her haemoglobin was only 6.2g/dL. Patient suddenly developed chest tightness, restlessness, shortness of breath and vomiting 30 minutes post-transfusion. Her condition further deteriorated requiring intubation and inotropic support. She was eventually discharged after one day from the intensive care unit. Donor was positive for multiple HLA antibodies, that were not directed against the patient's HLA antigen. The diagnosis of TRALI was made by clinical and radiographic evidence.

Conclusion
TRALI is a rare but serious complication of transfusion therapy. The latest International Revised Consensus classifies TRALI as Type I and Type II based on the underlying acute respiratory distress syndrome (ARDS). Although HLA or HNA antibody remain as an established cause of TRALI, clinical TRALI (antibody negative) is always related to the biologically active agents present in the transfused blood products. In cases where the antibody is positive in donor however it does not cognate with the recipient, the immunological impact exerted by these antibodies on recipient remains undiscoverable. Prompt diagnosis of TRALI is important and notification of these reports to the blood transfusion service and National Haemovigilance Coordinating Center is crucial to ensure a proper investigation is carried out to prevent future morbidity and mortality in other patients.

Keywords: TRALI, HLA, antibody, immunological

"The authors have no conflict of interest to declare."

APS-TU46: Significance of Nucleic Acid Amplification Test (NAT) for the Detection of Occult Hepatitis B Infection (Obi) and Latent Infection among Blood Donors in Malaysia: A Population-Based Study

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Background
Voluntary non-remunerated blood donors (VNRBDs) are essential for sustaining national blood supplies. Screening for major transfusion-transmitted infections (TTIs) is crucial to ensure the safety of blood products. The aim of this study is to compare the results of serological tests and molecular technology (NAT, Nucleic Acid Amplification Test), identify donors in the diagnostic window period, and determine the prevalence of hepatitis B virus (HBV), hepatitis C virus (HCV), human immunodeficiency virus (HIV), and syphilis.

Methods
We conducted a retrospective cohort data analysis of routine blood donation data (January 2018 to December 2023), collected from VNRBDs by the Transfusion Medicine Unit, Hospital Universiti Sains Malaysia (USM). Variables included age, ABO/Rhesus blood groups, and screening results of TTIs (HBsAg and anti-HCV, anti-HIV, and anti-Syphilis) by chemiluminescent microparticle immunoassay (CMIA) (ARCHITECT® Reagent Kits, Abbott Diagnostics, USA) were analyzed. Confirmation test for HBV was performed by anti-HBs neutralization assay (ARCHITECT® HBsAg Qualitative II assay confirmatory), HCV and HIV using INNO-LIA® (Fujirebio, Japan), and NAT using transcription-mediated amplification (TMA) method (Procleix Panther System, Synapse Laboratory, Malaysia).

Results
Of approximately 70,048 donors from 2018 to 2023, 157 (0.22%) tested reactive for serological and/or NAT markers: HBV (36.3%), HCV (18.5%), HIV (14.1%), and Syphilis (31.2%). Notably, HBV and Syphilis exhibited the highest prevalence of TTIs. The majority of reactive donors (82%) were males, with 18% being females with a high prevalence of O positive blood group. The mean age was 38 years, ranging from 18 to 65 years old. We observed that 5 (8.7%) donors, who were HBsAg and anti-HBs sero-negative, tested positive for HBV NAT. Additionally, 10 (34.5%) and 2 (9.1%) donors with HCV and HIV sero-positivity (confirmed by INNO-LIA®), showed NAT negativity. Conclusion: NAT proves to be a sensitive method for detecting occult hepatitis B infection (OBI) and HCV and HIV at clinical latency periods.

"The authors have no conflict of interest to declare."

APS-TU47: Delayed Haemolytic Reaction Due to Anti–Jka Alloimmunisation

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Introduction
The Kidd blood group system holds significant importance in transfusion medicine, as it often becomes undetectable over time but exhibits an anamnestic response upon exposure, such as during events like pregnancy or blood transfusion. We report a case of delayed haemolytic transfusion reaction (DHTR) in a patient who had received a blood transfusion in the past.

Case Report
A 35-year-old nulliparous woman diagnosed with adenomyosis presented with severe dysmenorrhea and subfertility. During a hospital admission for provoked deep vein thrombosis related to her underlying condition, she received subcutaneous low molecular weight heparin. Unfortunately, this treatment resulted in hypovolemic shock due to significant per vaginal bleeding. The initial indirect antiglobulin test (IAT) was negative. She received multiple blood transfusions over 7 days. A subsequent positive IAT following transfusions suggested the development of alloantibodies in the recipient's serum, later identified as anti-Jka. Haemolytic workup revealed ongoing mild haemolysis within 24 hours. The patient's history of a single-unit packed cell transfusion in 2021, coupled with a retrospective investigation, uncovered significant recent exposure to Jka-positive blood. The patient was started on a treatment regimen of steroids and intravenous immunoglobulins for three days. Her haemoglobin level was 7.9g/dL upon discharge and rose to 12.3g/dL in two weeks. The donor for the blood bag in 2021 was identified as Kidd type Jka+b+. Three months later, the patient's antibody screen returned negative.

Discussion
In the absence of serological evaluation after transfusion, red cell alloantibody evanescence can contribute to the risk of DHTR. It is important to regularly monitor the clinical effects of transfusion and foster good teamwork between specialists in transfusion medicine and clinicians. DHTR can be managed with steroids and intravenous immunoglobulins, yielding a good outcome.

Keywords: Delayed haemolytic transfusion reaction, anamnestic response

"The authors have no conflict of interest to declare."

APS-TU48: Transfusion-Related Acute Lung Injury Type I in Trauma Patient – A Case Report

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Introduction
Transfusion-related acute lung injury (TRALI) is a severe and lethal adverse reaction of blood transfusion, characterized by rapid onset of lung injury and noncardiogenic pulmonary oedema within 6 hours post transfusion. The incidence was reported less than 1% in Malaysia. Among the suggested mitigation strategies is exclusion of female donor plasma.

Case Report
We reported a case of 37-year-old healthy male, stable, trauma patient sustained open fracture of radius and liver contusion. He was planned for surgery and administered plasma preoperatively for trauma induced coagulopathy. Urticaria reactions developed 30 minutes post transfusion and resolved after intravenous steroid and antihistamine administration. One hour later, he developed dyspnoea with oxygen saturation (SPO_2) reduced to 80% under room air. Lung examination revealed reduced air entry with fine crepitations. Oxygen therapy was started up to Ventimask 60% and his SPO2 improved to 94%. Arterial blood gas showed respiratory failure while his chest radiograph revealed non cardiogenic pulmonary oedema. He was intubated and required mechanical ventilation for 24 hours. During the period, patient successfully underwent surgery. He recovered well and was discharged on day 3 post-surgery with no residual respiratory complications. He was treated as TRALI type 1 as patient had no pre-existing acute respiratory distress syndrome. Multiple anti-human leucocyte antigen (HLA) type I and II were detected in one of the plasma donors.

Discussion
TRALI is caused by neutrophil-mediated pulmonary vascular damage from donor blood human neutrophil antigen (HNA) or HLA antibodies binding to recipient antigens. In this case, the implicated donor was multiparous woman and regular donor for several years. The incidence was only found in her recent donation, which may be explained by increased HLA-sensitization with multiple pregnancies. TRALI treatment mainly includes supportive management, however it may require invasive oxygen therapy and this may pose as burden to our healthcare.

Keywords: Transfusion related acute lung injury, TRALI type I, HLA antibodies

"The authors have no conflict of interest to declare."

APS-TU49: A Case of Warm Autoimmune Haemolytic Anemia with Solely C3d Positivity

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Introduction

Warm Autoimmune Hemolytic Anemia (AIHA) is a rare condition marked by autoantibodies targeting one's red blood cells at an optimum temperature of 37°C. Most cases involve polygenic IgG autoantibodies, and some include complement proteins (C3d). Warm AIHA solely mediated by C3d is uncommon.

Case Report

Here we present an unusual case of warm AIHA which is solely mediated by C3d in a 66-year-old woman with relapsed diffuse large B-cell lymphoma. The patient experienced severe, life-threatening anemia with evidence of spherocytosis without red blood cell agglutination observed in her blood film. Other investigations revealed elevated indirect bilirubin, an increased reticulocyte count, and elevated lactate dehydrogenase levels. She received one course of intravenous immunoglobulin, corticosteroid, Rituximab, and blood transfusions to address her condition. Unfortunately, despite the intervention, the patient ultimately succumbed to death, with pulmonary embolism cited as the cause of death.

Discussion

Various theories have been proposed regarding this condition, suggesting that it may be attributed to a limited IgG coating of red blood cells (RBCs) not easily detectable through conventional laboratory tests or the dissociation of the antibody-antigen complex, leaving complement as the sole binder to the RBCs. Warm AIHA presenting with only C3d is relatively infrequent and creates challenges in both diagnosis and treatment. Consequently, a comprehensive clinical and laboratory investigation is imperative for achieving an accurate diagnosis.

Keywords: Warm AIHA, DAT, relapse DLBCL, complement C3

"The authors have no conflict of interest to declare."

APS-TU50: The Prevalence of Beta Thalassaemia Carrier in Thalassaemia Screening Programme in Northwest Region of Kelantan – A Research Report

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Introduction
Thalassaemia is the most common autosomal recessive haematological disorder. Within the thalassaemia group, ß-thalassaemia imposed a more severe health implication and economic burden towards the patient and healthcare system. Study shows that RM 2.7 million is spent on one patient of ß-thalassaemia major during their life. Thus, in 2016, the Ministry of Health introduced a screening programme aimed at secondary-school students aged 16 years old for an opted blood investigation. This program aimed to screen thalassaemia carriers and offer counselling to reduce the number of new births with ß-thalassaemia major.

Objective
The objective of this study is to report the prevalence of ß-thalassaemia carriers among 16-year-old students during the year 2022 in the Thalassaemia Screening Programme in the northwest region of Kelantan.

Methods
This is a cross-sectional study of data from the Thalassaemia Screening Programme, held by the School Health Unit of the northwestern region of Kelantan. This study was comprised of 2765 participants who consented. Participants are being screened with a compulsory Full Blood Count test and further investigation with a Haemoglobin Analysis Test for highly suspected cases. A raised HbA2 (>3.5%) during the test confirms the diagnosis. Data was described in frequency, and prevalence was described in percentage.

Results
The total number of consented participants is 2765, with 44 participants diagnosed as ß-thalassaemia carriers with a 1.6 % prevalence. The data reported are higher compared to data from 2019 of the same region, which shows 1.1 % prevalence. However, data also show a lower prevalence compared to Kelantan's state which has a 5.8 % prevalence and a national prevalence of 4.5 % in 2019.

Conclusion
The data collected show different prevalence compared to the previous year's data for the same region, state and country. The cause of the difference in prevalence may need to be further studied.

Keywords: Prevalence of ß-thalassaemia carriers, economic burden of thalassaemia, ß-thalassaemia carrier in Kelantan, thalassaemia screening programme in Kelantan

APS-TU51: Therapeutic Plasma Exchange and Therapeutic Phlebotomy in Patient with Guillain-Barre Syndrome and Secondary Polycythemia

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Introduction
Guillain-Barré syndrome (GBS) is a polyradiculoneuropathy disease caused by the autoimmune. Secondary polycythemia is an increased erythropoiesis due to external factors outside the bone marrow as a physiological response to tissue hypoxia. This case report aims to demonstrate the success of therapeutic plasma exchange (TPE) and therapeutic phlebotomy (TP) in treating quadriparesis in a patient with GBS and secondary polycythemia.

Case Report
A 20-year-old male factory worker with chief complaint of quadriparesis, preceded by fever, cough, and flu for 1 week before admitted to the hospital. Patient was a smoker and had exposure to benzene and sulfuric acid. Decreased motor strength and tone in four extremities (upper extremities 2/2 and lower extremities 2/2) and there was bilateral peripheral type facial nerve paresis. Hematological examinations [hemoglobin, hematocrit, serum erythropoietin (EPO), JAK2V617F mutation], electromyography (EMG), and radiologic examination [chest X-ray and brain multi-slice computed tomography (MSCT) scan] were conducted. The patient received conservative therapy (Mecobalamin 40 mg, Omeprazole 20 mg, Citicoline 500 mg) and a combination therapy of TPE once and TP once, followed by routine blood test re-evaluation and clinical symptom observation.

Discussion
Hematological findings showed leukocytosis (13.1 x 103/μL) and erythrocytosis (Hb: 20.7 g/dL, Hematocrit 61%). JAK2V617F mutation was not detected and EPO within normal limit (7.3 mIU/mL), indicating secondary polycythemia due to systemic hypoxia induced by tobacco smoking. Chest X-ray and brain MSCT scan results were normal, but EMG showed acute inflammatory demyelinating polyradiculoneuropathy GBS. The role of TPE in treating GBS by removing antibodies causing inflammation of peripheral nerves with albumin. In this patient, TPE treatment based on American Society for Apheresis (ASFA) category I grade 1A, meaning TPE is the first-line therapy. Conservative management and combination therapy of TPE and TP successfully restored hematocrit to normal level and maximal improvement of motor strength in four extremities.

Keywords: Guillain-Barré syndrome, secondary polycythemia, therapeutic plasma exchange, therapeutic phlebotomy

"The authors have no conflict of interest to declare."

APS-TU52: A Comprehensive Insight into the Massive Transfusion Protocol at Hospital Melaka

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Introduction
Massive Transfusion Protocol (MTP) is a systematic approach designed to ensure rapid administration of blood components in predefined ratios to optimize patient outcomes, streamlining the process for effective resuscitation during massive blood loss. Very few studies that delve into the implementation of MTP have been published.

Objective
This study aims to comprehensively evaluate the practice of MTP at Hospital Melaka.

Methods
This cross-sectional study included all patients involved in MTP activation at Hospital Melaka from April 2022 to July 2023. Data were systematically abstracted from the Blood Bank Information System (BBIS) and patients' medical records. Microsoft Excel was employed for data analysis.

Results
During the study, there were 43 MTP activations involving 37 patients, predominantly Malaysians (92%), with the majority being Malays (79%), male (78%), under 21 years old (56%), and had blood group O (43%). The prevalence of MTP activation is higher in trauma patients (92%). In 90% of cases, a Shock Index (SI) above 1 indicated the severity of cases triggering MTP activation. 30% of cases were terminated following Cycle 1, whereas 56% were terminated following Cycle 2. Cycle 1 blood components were obtained within 30 minutes in only 40% of cases, and 73% of blood collection for Cycle 2 exceeded 60 minutes. The 24-hour survival rate was 73%.

Conclusion
Most cases meet the criteria for MTP activation. However, delayed blood collection poses a critical issue that requires attention. Addressing delays, conducting thorough clinical evaluations, and improving communication among healthcare providers is crucial for optimizing patient care with each MTP execution.

Keywords: Massive transfusion protocol, blood transfusion

"There are no conflicts of interest."

APS-TU53: Overview of Temperature Monitoring During Blood Product Transportation Between Hospital UiTM Facilities and Pusat Darah Negara Kuala Lumpur

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Introduction
The process of transporting blood products such as packed cells (PC), platelets (PLT), fresh frozen plasmas (FFP) and cryoprecipitates (Cryo) out of the standard temperature range could potentially damage the blood products and lead to adverse reactions in the patient's following transfusion. Some blood banks verify the temperature of the transportation arrangement for one time and use the same arrangement for blood product transportation. However, some blood banks still practice recording the temperature data for each transportation arrangement.

Objective
The objective of this study was to perform an overview of blood products' temperatures during transportation between Hospital Universiti Teknologi MARA (UiTM)'s facilities (Hospital Al Sultan Abdullah UiTM Bandar Puncak Alam and Pusat Perubatan UiTM Sungai Buloh) and Pusat Darah Negara Kuala Lumpur from October 2022 to October 2023.

Methods
The temperature data of transportation for PC, PLT and FFP/Cryo were recorded using a temperature data logger (testo 184-T3, Malaysia). The temperature readings commenced upon placing the blood products in the transportation box and ended upon removal of the products from the box. The information such as average, minimum and maximum temperatures from the recorded data was extracted.

Results
The findings revealed a total of 361 data points for PC, 115 for PLT and 54 for FFP/Cryo. Of these, the average temperatures for PC, PLT and FFP/Cryo were 5.7°C, 22.4°C and -16.9°C respectively. The maximum temperatures recorded were 11.6°C for PC, 26.1°C for PLT and -7.6°C for FFP/Cryo whereas the minimum temperatures recorded were 1.9°C for PC, 19.1°C for PLT and -24.5°C for FFP/Cryo. Despite the minimum temperature for PLT was below the standard temperature, the maximum temperatures for all products exceeded the standard.

Conclusion
This study shows that maintaining the PLT temperature within the standard temperature range proved to be challenging. The elevated temperatures during transportation for all products need further investigation. Various factors including number of ice packs, type of insulated box being used, duration of transportation and weather conditions may affect the temperatures.

Keywords: Blood product transportation, packed cells, platelets, fresh frozen plasmas, cryoprecipitate

"The authors declare that there is no conflict of interest."

APS-TU54: Administration of IV Iron Isomaltoside to Preoperative Patient for Haemoglobin Optimization in Iron Clinic Hospital Seri Manjung from April 2021 to April 2023

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Introduction
Parenteral iron administration is an important part of the first pillar of Patient Blood Management, which is optimising erythropoiesis. Iron Isomaltoside (IIM) is a parenteral iron formulation indicated in Iron Deficiency Anemia when oral iron preparations are contraindicated or when there is a clinical need to deliver iron rapidly. IIM has few adverse effects compared to iron sucrose and is beneficial for both patients and healthcare professionals. IIM administered in a single dose reduces the blood transfusion rate and is overall time and cost-saving.

Objective
To highlight the usage of IIM among preoperative patients in Iron Clinic Hospital Seri Manjung from April 2021 to April 2023.

Methods
A retrospective observational study was done on preoperative patients who received IIM in Iron Clinic Hospital Seri Manjung between April 2021 to April 2023. Data collected included the haemoglobin levels pre and post infusion, blood transfusion requirement preoperative and any adverse reactions noted.

Results
From April 2021 to April 2023, 21 preoperative patients received a single dose of IV IIM 1000mg. About 85% (18) of the patients showed increased haemoglobin levels, 5% (1) decreased haemoglobin levels, 5% (1) static haemoglobin and 5% (1) defaulted follow-up. Five per cent (1) of patients developed a mild fishbane adverse reaction. Fifteen patients did not require blood transfusion preoperatively.

Discussion
This study suggests that IIM is beneficial for haemoglobin optimisation and can improve surgical outcomes by reducing the need for blood transfusion. It is time and cost-saving for patients and healthcare providers as it only requires a single administration.

Conclusion
In conclusion, administering IIM preoperatively causes a modest increase in haemoglobin concentrations and a significant reduction in the blood transfusion rate.

Keywords: IV iron isomaltoside, preoperative

"No conflict of interest in this study."

APS-TU55: Diagnostic Testing Analysis of Thromboelastography in Patients with Sepsis Coagulopathy Using Septic-Induced Coagulopathy Score

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Introduction
Coagulopathy is common in septic patients and is associated with increased mortality. Thromboelastography (TEG) is routinely used to monitor coagulation system abnormalities in patients with sepsis. However, it is not known whether TEG can be used for the diagnosis of sepsis-induced coagulopathy (SIC).

Objective
Assess the correlation between TEG and SIC parameters, as well as TEG's ability to establish the diagnosis of coagulopathy in sepsis patients at Saiful Anwar Hospital.

Method
This observational analytic study was conducted on 27 sepsis patients treated at the Intensive Care Unit (ICU) of Dr. Saiful Anwar Hospital Malang from August to September 2020. Patients with a history of severe liver and kidney dysfunction, malignancy, haemostasis disorders, previous use of anti-platelet drugs, and oral anticoagulants were excluded from the study. The study subjects were divided into two groups, namely SIC and non-SIC patient groups. ROC analysis was used to assess the diagnostic ability of TEG parameters.

Result
A correlation was found between TEG and SIC scores, where CI, MA, α angle parameters decreased significantly at SIC ($p<0.05$), while K time increased significantly at SIC ($p<0.05$). No significant correlation was found in the R time parameter. The TEG parameters for SIC diagnosis were MA (AUC=0.921), K Time (AUC=0.893), α angle (AUC=0.881), and CI (AUC=0.837). MA cut-off value of 57.7 minutes, K Time of 2.5 minutes, α angle of 58.05°, and CI of -1.35 with the sensitivity of 100%, 100%, 100%, 83.3% respectively, and specificity of 81%, 71.4%, 71.4%, 71.4% respectively.

Conclusion
TEG examination can be used as a diagnostic test for coagulopathy in septic patients, where the MA parameter has the best diagnostic value.

Keywords: TEG, SIC, diagnosis, sepsis

APS-TU56: 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 97252 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.

Keywords: Adverse transfusion reaction

“There is no conflict of interest in this study.”

APS-TU57: The Relationship of CD4+ T-Lymphocyte Counts and the Incidence of Erythrocyte Alloimmunization in Repeated Transfusion Patients

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Introduction

Alloimmunization is the most common risk of repeated erythrocyte transfusions which results in difficulties and delays in providing compatible blood, leading to hemolytic transfusion reactions. The development of alloantibodies after exposure to non-self erythrocyte antigens is influenced by several factors including recipient CD4+ T lymphocyte cells. The process of forming alloantibodies is a complex process that involves interactions between antigen presenting cells, T-lymphocyte and B-lymphocyte cells.

Objective

To determine the relationship between CD4+ T lymphocyte counts and the incidence of erythrocyte alloimmunization in patients with repeated transfusions.

Methods

This is an analytical research with a cross-sectional design study on 16 patients aged >18 years who were treated in the Internal Medicine Department of RSUP Dr. M. Djamil Padang with a history of packed red cell (PRC) transfusions of at least 3 units in the last three months. Patients with C-reactive protein levels >100 mg/dL, positive direct antiglobulin test and positive auto-control were excluded from this study. Positive alloantibodies are determined from positive indirect antiglobulin test results. CD4+ T lymphocyte cell counts were carried out using the immunoassay method with fluorescence imaging optics. Data were analyzed using the unpaired t-test, statistically significant if the p value <0.05.

Results

The subjects of this study were equally male and female, 8 people each (50%) with an average age of 44.3 years old, range 23-69 years old. The mean CD4+ T lymphocyte cell count in the alloantibody positive group was 474 (397) cells/μL. The mean CD4+ T lymphocyte cell count in the alloantibody negative group was 1275 (560) cells/μL. Statistical tests showed a significant relationship between CD4* T lymphocyte counts and the incidence of erythrocyte alloimmunization (p= 0.009).

Conclusion

There is a significant relationship between CD4+ T lymphocyte counts and the incidence of erythrocyte alloimmunization in patients who receive repeated transfusions.

Keywords: CD4+ T lymphocyte cells, erythrocyte alloimmunization, repeated transfusions

"There is no conflict of interest in this study."