Febrile, Allergic and Hypotensive Reactions (FAHR) Case Studies

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Mismanagement of a febrile reaction to a platelet transfusion given outside of guidelines

- *A patient with pancytopenia, receiving an adult therapeutic dose of platelets to cover a bone marrow biopsy on the haematology ward, developed rigors and a temperature rise to 38°C after completion of transfusion*
- *They were treated with an antihistamine and hydrocortisone and repeat group and screen was sent*
- *No blood cultures were performed*
- *The patient recovered completely within 4 hours*

Mixed febrile/allergic reaction to granulocytes in a patient with an allergic predisposition

- *A patient post allogeneic bone marrow transplant for aplastic anaemia received granulocytes in the evening for neutropenic sepsis*
- *The patient developed facial oedema, urticaria and dyspnoea*
- *Temperature increased from 37 to 38.5°C*
- *There was a mild blood pressure drop from 136/81 to 114/57mmHg*
- *The patient had known allergy to banana and peanuts and carried an EpiPen*
- *They were treated with their own EpiPen 300µg intramuscular (IM) whilst waiting for the emergency drug bag and then received a further 500µg IM dose of adrenaline after 5 minutes*
- *They were transferred to intensive care for overnight observations but made a full recovery*

Inappropriate use of fresh frozen plasma (FFP) prior to liver biopsy results in an anaphylactic reaction

- *A patient was given FFP prophylactically prior to liver biopsy due to prolonged international normalised ratio*
- *They developed itching, wheeze, angioedema, and a drop in oxygen saturations requiring the anaphylaxis pathway*

Inappropriate investigation and management of a febrile platelet reaction

- *A patient with lymphoma developed fever and rigors on their way home after an outpatient platelet transfusion*
- *They returned to hospital and were treated with hydrocortisone and chlorphenamine*
- *Repeat group and screen was sent but no blood cultures were performed*

Inappropriate investigation and follow-up plans for a patient after an allergic reaction to fresh frozen plasma (FFP)

- *A patient developed itching and eye swelling during transfusion of FFP in the context of major haemorrhage*
- *They were appropriately treated with an antihistamine and their symptoms settled*
- *They were investigated with a repeat group and screen and because of this reaction, a flag was placed on their record to require a serological crossmatch (rather than electronic issue) for future transfusions*

Misclassification of a febrile reaction results in inappropriate immediate and future management

- *A child with aplastic anaemia receiving a platelet transfusion developed a fever of 39.2°C with rigors, hypertension and tachycardia*
- *There were no allergic features*
- *He was given an antihistamine and hydrocortisone and a plan was made for prophylactic chlorphenamine before future platelet transfusions*

Unnecessary investigations for an allergic reaction

- *A male in his 30s with thalassaemia, who had a history of allergic reactions in other settings, developed rash, urticaria, facial swelling and mild hypotension after 60mL of his third unit of red cells had been transfused*
- *Transfusion was discontinued, he was given an antihistamine and hydrocortisone and his symptoms settled*
- *He was investigated with IgA levels, mast cell tryptase, repeat group and screen, direct antiglobulin test and blood cultures, none of which showed any abnormality*

Allergic reaction to an unnecessary platelet transfusion

- *A man in his 50s was transfused one adult therapeutic dose (ATD) of apheresis platelets to cover a peripherally inserted central catheter (PICC) insertion in interventional radiology*
- *He developed peri-orbital and lip swelling and a rash*
- *He was treated with intravenous (IV) hydrocortisone and chlorphenamine with resolution of his symptoms*

Future transfusion plan fails to account for reaction type

- *A woman in her 80s with transfusion-dependent anaemia required one unit of red cells following two large nose bleeds*
- *Her haemoglobin (Hb) was 68g/L with a stated target Hb of >90g/L*
- *Midway through transfusion she developed pyrexia (temperature 38°C from baseline 36.5°C), rigors and vomiting*
- *The transfusion was stopped*
- *Investigations revealed no evidence of a serological reaction*
- *On review, frequent transfusion reaction investigations had been performed previously due to similar symptoms*
- *The patient was given a plan for premedication with paracetamol, chlorphenamine, hydrocortisone and furosemide for future transfusions*

Inappropriate treatment of a febrile reaction

- *A patient in his 50s with acute myeloid leukaemia attended the haematology day unit for a routine platelet transfusion*
- *On completion he developed rigors, fever, and breathlessness. His temperature rose to 40.1°C from a baseline of 37.4°C and oxygen saturations fell to 94% on oxygen*
- *He was given IV hydrocortisone and antihistamine with little effect. He was subsequently administered 1mg adrenaline, 4.5g piperacillin with tazobactam (tazocin) (antibiotic) IV, 1g paracetamol and IV fluids*
- *His symptoms settled over the following hour, but he was admitted for observation. Blood cultures were negative and there was no rise in mast cell tryptase*

Inappropriate treatment in the presence of a potential haemolytic transfusion reaction

- *A lady in her 70s with myelodysplastic syndrome and known alloantibodies attended for a scheduled two-unit blood transfusion. The units had been crossmatched at the reference laboratory due to slight reaction on crossmatch when performed in-house.*
- *Halfway through the second unit the patient developed rigors, a rise in temperature (38.4°C from baseline 37.7°C) and elevated blood pressure (130/60 to 167/88 mmHg)*
- *The nurse stopped the transfusion and asked for medical review. The registrar prescribed 10mg antihistamine and 100mg hydrocortisone and told the nurse to continue the transfusion in 30 minutes*
- *However, the patient's symptoms worsened, and she complained of pain in her kidneys. She was given a further 100mg hydrocortisone and 1g paracetamol. Her symptoms resolved within a few hours*
- *Samples sent for serological investigation revealed no evidence of a haemolytic transfusion reaction*

Appropriate treatment

- *A man in his 20s who had suffered polytrauma received a postoperative blood transfusion*
- *After 30 minutes, routine observations revealed a temperature rise from 37.6 to 39°C*
- *He was treated with IV paracetamol and transfusion was continued. His temperature continued to reduce until returning to baseline around 12 hours post transfusion*

Febrile reaction occurring with platelets given for an erroneous result

- *A patient in her 80s was admitted for symptoms relating to a pulmonary embolism*
- *She was prescribed two units of platelets for a low platelet count (reported as $29x10^9/L$)*
- *During the second unit she developed rigors, a fever of 39.2°C and an elevated heart and respiratory rate*
- *The laboratory had noted platelet clumping and had revised the report on the system however the medical team had already acted on this initial result*

Severe allergic reaction when given platelets to reverse aspirin

- *A patient in his 70s was transfused two doses of platelets in theatre*
- *He was undergoing surgery for an acute subdural haematoma and platelets were given as he was on aspirin*
- *Fifteen minutes after his second dose, the patient developed a rapid rash covering his body and hypotension unresponsive to vasopressors*
- *The patient was treated for anaphylaxis and rapid stability was achieved*

Avoid unnecessary transfusion

- *A female in her 60s was found to have a haemoglobin of 48g/L when routine blood tests were carried out at her general practice surgery*
- *She experienced severe rigors, back pain, breathlessness and felt very cold 15 minutes after being transfused a unit of red cells for symptomatic anaemia*
- *Paracetamol alone was used to treat this reaction*
- *Future management will be with intravenous (IV) iron*

Febrile reaction inappropriately treated with an antihistamine and steroid

- *A day case patient in their 60s with myelodysplasia, haemolysis and neutropenia developed a temperature rise to 39.7°C, rigors and nausea during a red cell transfusion*
- *They were treated with hydrocortisone, chlorphenamine, paracetamol, antibiotics and admitted on to a ward*
- *Future transfusion management was stated to be pre-medication with an antihistamine and steroid*
- *Although it is not clear if steroid treatment may be beneficial for the management of their haemolysis it is unlikely to prevent a further febrile-type reaction and may make infection more likely in a vulnerable, neutropenic patient*

Reducing the number of units given at each transfusion episode as a reaction prevention strategy

- *A patient in their 60s with chronic transfusion dependent anaemia received a red cell transfusion as an inpatient*
- *During the transfusion, they developed a temperature of 38°C associated with chills and rigors*
- *The rate of the transfusion was reduced and they were given paracetamol, however their symptoms reoccurred therefore the transfusion was discontinued*
- *Future management was to limit transfusion episodes to a single unit of red cells and was reported to be effective*

Use of iron to avoid the need for red cell transfusion

- *A patient in their 80s was admitted to the ambulatory care unit for a two-unit red cell transfusion for symptomatic iron deficient anaemia*
- *Chlorphenamine and ondansetron were given pre transfusion*
- *On completion of the first unit the patient developed a temperature rise of more than 2°C, rigors, nausea and was treated with paracetamol*
- *They were discharged later the same day and intravenous iron agreed as future management*
- *It is unclear what the expected benefit was of pre-transfusion chlorphenamine, however treatment with paracetamol and future management with intravenous iron are rational*
- *If intravenous iron is given prior to the development of symptoms this is likely to prevent the need for further urgent admission and red cell transfusion*

A febrile reaction appropriately treated with paracetamol

- *A patient in their 80s received a red blood cell transfusion to treat ongoing non-severe bleeding associated with a haemoglobin (Hb) of about 80g/L*
- *After 100mL had been transfused (30–60 minutes) the patient experienced rigors, an increase in respiratory rate and the temperature was noted to have risen from a baseline of 36.6°C to 38.3°C*
- *There were no other symptoms or signs*
- *The transfusion was initially slowed and then discontinued*
- *Paracetamol was prescribed and the patient's observations returned to baseline*
- *Bacterial cultures from the patient at the time of the reaction were negative*
- *No change in management was planned for any subsequent blood transfusion*

A febrile reaction to red cells. To receive iron as future management of iron deficiency anaemia

- *A patient with menorrhagia and Hb of 50g/L was transfused with red cells. After the first unit her post-transfusion observations identified a pyrexia of 39.6°C (an increase of more than 2°C from baseline) and tachycardia of 120 beats/minute*
- *She was given treatment which included paracetamol and made a complete recovery with observations returning to baseline over 1-4 hours*
- *Repeat serology was negative and future management was planned with intravenous iron and avoidance of blood transfusion*

Allergic reaction to apheresis platelets with planned transfusion of pooled platelets suspended in PAS for future management

- *A child with reversible bone marrow failure and thrombocytopenia received apheresis platelets prior to an operation*
- *Within 10 minutes of the start of the transfusion, periorbital oedema, wheezing and a fall in oxygen saturations to 92% on air occurred*
- *Oxygen therapy, hydrocortisone, chlorphenamine and salbutamol nebuliser were given with complete recovery within 1-4 hours*
- *Investigation did not identify IgA deficiency and mast cell tryptase remained within the normal range*
- *The patient had experienced previous mild reactions to apheresis platelets and so it was agreed that in future platelets suspended in PAS would be used to reduce the risk of a further allergic reaction*

A febrile reaction treated with hydrocortisone and chlorphenamine

- *An adult male with sickle cell disease attended an outpatient department to receive an exchange blood transfusion*
- *After the first unit of red cells he developed rigors. Observations revealed a temperature of 38.6°C and a rise of 2°C*
- *His blood pressure was also increased compared to pretransfusion observations but there were no respiratory signs or symptoms*
- *The transfusion was discontinued and he was given hydrocortisone and chlorphenamine*
- *He recovered in less than one hour and was subsequently admitted to the ward for antibiotics to treat a possible chest infection*
- *Repeat serology and blood culture of the patient and implicated unit were negative*

A moderate febrile reaction resulting in transfer of the patient from a community hospital to a larger hospital with an emergency department

- *An elderly male with myelodysplastic syndrome (MDS) received two units of red cells in a community hospital*
- *He was known to have anti-C, anti-Kpa and a non-specific autoantibody*
- *Following transfusion of his second unit routine observations identified a temperature rise from 36.9°C prior to transfusion to 38.7°C*
- *An ambulance was called and the patient transferred to the emergency department at a larger hospital*
- *On arrival he was given paracetamol, his temperature settled and he was discharged home*
- *Repeat serology, and culture of the patient and implicated unit revealed nil significant*

An allergic reaction to apheresis platelets

- *An elderly male with MDS and possible sepsis but no bleeding received a unit of apheresis platelets*
- *Ten minutes after starting the transfusion he developed a swollen tongue and was unable to talk*
- *His observations were stable, the transfusion was discontinued and he was given intravenous hydrocortisone*
- *The reaction resolved and a decision made that further platelet transfusion should routinely be covered with both hydrocortisone and chlorphenamine*

A severe reaction in a patient with IgA deficiency

- *An adult female received transfusion of red cells to treat a postpartum bleed on the delivery ward*
- *Within 15 minutes of the start of the transfusion she developed fever, chest tightness and throat swelling associated with a temperature rise of more than 2°C to 39.7°C, dyspnoea and visible angiodema*
- *She received paracetamol, an antihistamine, hydrocortisone and intravenous adrenaline*
- *After 4 hours her observations settled*
- *Subsequent investigation identified that she was IgA deficient with IgA antibodies and IgA deficient or washed red cells were recommended for any future transfusion*