QUESTION 46

Which of the following is most likely to prevent recurrent febrile non-haemolytic transfusion reactions in a patient requiring regular transfusion?

A. Warm blood to 37°C
B. Leucodepletion
C. Gamma-irradiation
D. CMV-negative donors
E. Slow transfusion time

TRANSFUSION REACTIONS

- Occur in 1-6% of transfusions
- More common in haem/onc pts
- Can be immunological, infectious, chemical and physical
- Acute or delayed
- Major immunological reactions:
  - Febrile non-haemolytic transfusion reactions
  - Acute haemolytic transfusion reactions
  - Delayed haemolytic transfusion reactions
  - Urticarial transfusion reactions
  - Transfusion-related acute lung injury
  - Post-transfusion purpura
  - Graft vs host disease (rare, primarily in immunocompromised)

FEBRILE NON-HAEMOLYTIC REACTIONS

- Most common transfusion reaction
- Fever, chills, sometimes mild dyspnoea within 1-6hrs of PRBCs or plt
- Benign, no lasting sequelae
- About 15% of pts who have FNHTR will have second reaction with further transfusions
- Caused by cytokines which accumulate during storage of blood components
- Thought that interaction between donor leukocytes and recipient antibodies leads to cytokine release from donor leukocytes

Management

- Stop transfusion
- Send bloods for haemolysis screen
- Antipyretics

Prevention

- Leukodeplete blood (though few RCTs)
Answer: B

ACUTE HAEMOLYTIC REACTIONS

- Medical emergency
- Rapid destruction of donor RBCs by preformed recipient Abs
- Usually due to ABO incompatibility
- Occasionally due to acquired alloantibodies (eg: anti-Rh, anti-Jka)
- IgM Abs fix complement and cause rapid intravascular haemolysis
- Can lead to DIC, shock, ARF due to ATN

Clinical Presentation

- Classic triad of fever, flank pain and red/brown urine (rarely seen)
- Fever, chills
- DIC → bleeding

Initially…

- Stop transfusion
- ABC
- N/Saline infusion
- DAT, repeat XM, FBE

Treatment

- Generous IVT for UO >100-200mL/hr
- If DIC, consider heparinisation
- Rx of hyperkalaemia (may need dialysis and cardiac monitoring)
- Monitor EUC, coags
- Consider vasopressor (eg: dopamine)

DELAYED HAEMOLYTIC REACTIONS

- Due to Ab response occurring after re-exposure to foreign red cell Ag previously encountered by transfusion, transplantation or pregnancy
- Ab usually against Kidd or Rh
- Reactions seen 2 to 10 days after transfusion
- Usually extravascular haemolysis, gradual
- May see mild fever, falling HCT, mild increase in unconjugated bilirubin and spherocytosis
- Diagnosis often made by blood bank when pt has new positive antibody screen on next XM
- No treatment required usually
ANAPHYLACTIC REACTIONS

- Within a few minutes of transfusion beginning
- 1 in 20,000 to 50,000
- Usually due to anti-IgA antibodies in an IgA deficient patient
- Treatment = stop infusion, adrenaline, airway management etc
- Use IgA deficient blood next time

URTICARIAL REACTIONS

- Occurs when soluble allergenic substances in the plasma of donated blood react with pre-existing IgE antibodies → mast cells and basophils release histamine
- Can continue transfusion if not severe
- Anti-histamine

TRANSFUSION-RELATED ACUTE LUNG INJURY

- 1 in 2000
- Acute respiratory distress, hypoxaemia, hypotension, fever, pulmonary oedema initially without signs of LVF
- Usually begins within 2-4 hours of transfusion commencing
- Wide clinical spectrum
- Death in ~ 10%

Pathogenesis

- Pulmonary agglutinin reaction
- Though to require 2 insults:
  o Stimulus (eg: surgery, transfusion, infection) primes neutrophils and activates endothelial cells → increased adhesion molecules → neutrophil adherence to pulmonary endothelium
  o 2nd stimulus activates neutrophils → toxic mediators released, endothelial damage, increased capillary permeability. This 2nd process may be initiated by a lipid-soluble species formed during storage of blood
- Treatment = supportive

POST-TRANSFUSION PURPURA

- Uncommon
- Occurs primarily in women
- Severe thrombocytopenia develops 5-10 days after transfusion of platelet-containing products (including PRBCs)
- Low plts last days to weeks
- Immune-mediated
- Treatment = IVIG