**Question 1**

Features of heparin induced thrombocytopenia include

A It occurs in about 5% of patients receiving heparin

B It does not occur with low molecular weight heparin

C Bleeding is the main complication of the disease

D Type I is more dangerous than type II thrombocytopenia

Explanation A

Heparin induced thrombocytopenia (HIT) occurs in about 5% of patients. Most develop type I thrombocytopenia which is of little danger. Type II thrombocytopenia is less common but of much greater clinical significance. It occurs 5-14 days after heparin therapy begins. It is caused by antibodies that recognise complexes of heparin and platelet factor 4 (a normal platelet granule). Binding of heparin to these complexes results in the activation, aggregation and consumption of platelets (hence thrombocytopenia). However, this effect on platelets and endothelial damage combine to produce a prothrombotic state even in the face of heparin administration and thrombocytopenia (paradoxical). Life threatening arterial and venous thrombosis occurs. Unless heparin therapy is stopped, large clots will occur which will lead to organ and limb ischaemia (arterial side) and DVT and PE (venous side). If a patient was already exposed to heparin, the disease can occur earlier (as antibodies are already present). Low molecular weight heparin (LMWH) reduces the risk but does not remove it completely. If one developed HIT, even LMWH may exacerbate the thrombotic tendency and must be avoided

**Question 2**

Which of the following is true regarding Haemophilia A?

A It is an inherited disease only

B All forms of the disease produce severe bleeding

C Bleeding occurs in males only

D The extrinsic pathway is unaffected

Explanation D

Haemophilia A is the most common inherited disease associated with life threatening bleeding. Note, however, that 30% of patients do not inherit the disease but it is caused by new mutations in factor VIII. It is X linked inherited, so bleeding occurs in males and homozygous females. Patients with 6-50% of normal factor have a mild form of the disease. Although the extrinsic pathway is intact, it is insufficient to provide a stable clot and stop bleeding. The intrinsic pathway is required for the formation of a stable clot and this is deficient in Haemophilia. The PT is normal and the PTT is raised.

**Question 3**

Heparin induces which of the following?

A Heparin induces antibodies against red blood cells

B Heparin induces the antiphospholipid syndrome

C Heparin induces a prothrombotic state

D Heparin induces a thrombocytosis

Explanation C

Antiphospholipid syndrome (APS), although similar in pathogenesis to heparin-induced thrombocytopaenia (HIT), heparin does not induce APS. The mainstay of treatment is heparin followed by warfarin. Heparin induces antibodies against platelets and endothelium (HIT). Heparin induces a thrombocytopenia (HIT). During HIT- this effect on platelets and endothelial damage combine to produce a prothrombotic state even in the face of heparin administration and thrombocytopenia (paradoxical)-see below

Extensive explanations:

Antiphospholipid syndrome (APS) and heparin-induced thrombocytopenia (HIT) are immune-mediated thrombotic conditions caused by antibodies targeted to a protein-antigen complex. Although each disorder is attributed to two distinct antibodies, these autoimmune disorders are characterized by a similar pathogenesis that includes a hypercoagulable state, platelet activation, damage to the vascular endothelium, and inflammation. APS and HIT share similarities in the clinical presentation because each is associated with thrombocytopenia, a high risk of thrombosis in all venous and arterial sites, and catastrophic thrombotic outcomes occur if untreated

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**Question 4**

Which of the following laboratory findings in Immune thrombocytopaenic purpura is false?

A Elevated PTT

B Large platelets in the peripheral smear

C IgG autoantibodies

D Increased megakaryocytes

Explanation A

Blood workup- thrombocytopaenia, normal to increased megakaryocytes in the bone marrow, large platelets in the peripheral smear, PT normal, PTT normal. Autoantibody testing is not widely available, but is of the IgG class. The diagnosis however, is one of exclusion.

**Question 5**

Which is the most common inherited bleeding disorder in humans?

A Haemophilia B

B Von Willebrand disease

C Congenital prothrombin deficiency

D Haemophilia A

Explanation B

Von Willebrand disease is the most common inherited bleeding disorder in humans. Affecting about 1% of adults in the USA. Most of the time, the bleeding disorder is mild and goes unnoticed until a haemoststic stress, such a surgery or stress reveals its presence. Transmitted as an autosomal dominant disorder, but rare autosomal recessive variants have been discovered. Most often presents as bleeding form gums, menorrhagia. Lab tests show a prolonged bleeding time in the presence of a normal platelet count. There are 3 types. Type 1 and 3 are associated with a decreased vWF and type 2 has defective vWF.