Drugs Affecting Blood and Blood Formation

Questions

362. The treatment of choice in dicumarol poisoning is: (PGI 86, 89)
   a. Heparin
   b. Aminocaproic acid
   c. Vit K
   d. Vit C

363. Vitamin K is required for: (PGI 80, AIIMS 81)
   a. Overdosage of Dindovan
   b. Overdose of Heparin
   c. Haemophilia
   d. Christmas disease

364. Platelet aggregation is inhibited by:- (JIPMER 90)
   a. Clofibrate
   b. Aspirin
   c. Dipyridamole
   d. All of the above

365. Streptokinase acts by: (AIIMS 91)
   a. Vasodilator action
   b. Anticoagulant action
   c. Fibrinolysis
   d. Antiplatelet action

366. In dicumarol poisoning, which vit K is used: (JIPMER 98)
   a. Menadione
   b. Menaquinone
   c. Phytonadione
   d. None of the above

367. Heparin is:- (Rohtak 97)
   a. Polysaccharide
   b. Lipoprotein
   c. Monosaccharide
   d. Polyenoic acid
   e. Ceramide
368. Not true about heparin is: (PGI 98)
   a. Activates antithrombin III
   b. Small unionized molecule are not absorbed orally
   c. Protamine sulphate always used to reverse its action
   d. Release lipoprotein lipase from vessel wall & tissues

369. The tissue plasminogen activator produced by recombinant DNA technology is: (JIPMER 2002)
   a. Anestreplase
   b. Reteplase
   c. Altepase
   d. Abciximab

370. Abciximab acts through: (MANIPAL 01)
   a. TXA inhibitor
   b. ADP related inhibitor
   c. 2b/3a receptor antibody
   d. Fibrinogen degradations
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Answers

362. (c) Vit K
Ref: KDT 5th/e pg 565
Blooding as a result of extension of desired pharmacological action of Dicumarol is the most important problem: ecchymosis, epistaxis, hematuria, bleeding in GIT, intracranial or other internal haemorrhages may be fatal.

Treatment:
♦ Withhold anticoagulant
♦ Give fresh blood transfusion: supplies clotting factors & replenishes lost blood. Alternatively fresh frozen plasma can be used
♦ Vit K: specific antidote, but it takes 6-24 hrs for the clotting factor to be resynthesized & released in blood after Vit K administration

363. (a) Overdose of dindevan
Ref: KDT 5th/e pg 565
Dindevan is a phenindione:
♦ Overdosage of this drug cause bleeding as a result of extension of desired pharmacological action, the most important problem: ecchymosis, epistaxis, hematuria, bleeding in GIT, intracranial or internal haemorrhages may be total
♦ Vit K acts as a specific antidote in treating such pts, it takes 6-24 hrs for the clotting factors to be resynthesized & released in blood after Vit K administration.

364. (b) Aspirin
(c) Dipyridamole
Ref: KDT 5th/e pg 572, 580
♦ Aspirin at low doses, TxA2 formation by platelets is selectively suppressed
♦ Aspirin inhibits release of ADP from platelets & their sticking to each other.
♦ Dipyridamole inhibits phosphodiesterase & blocks uptake of adenosine to increase platelet (ANIP which potentiates PGI2 & interferes with aggregation levels of TxA2 or PGI1, are not altered but platelet survival time reduced by disease is normalized
♦ Dipyridamole has also been used to enhance antiplatelet action of aspirin
365. (c) Fibrinolysis
Ref: KDT 5th/e pg 569
- Streptokinase belongs to fibrinolytic group of drugs, these drugs lyse thrombi / clot to recanalise occluded blood vessels
- Streptokinase obtained from beta-haemolytic streptococci & Group C
- Combines with circulating plasminogen to form a complex which breaks plasminogen to plasmin
- Plasmin further causes fibrinolysis
- Streptokinase in antigenic, antibodies are produced against it after streptococcal infection or drug used

366. (c) Phytonadione
Ref: KDT 5th/e pg 559
- To reverse the effect of overdose of oral anticoagulants: Phytonadione (K1) is the preparation of choice, because it acts most rapidly, dose depends on the severity of upoprotrombinemia & bleeding. Unnecessary high dose is to be avoided because it will render the patient unresponsive to oral anticoagulants for several days
  - Severe : 10mg i.m followed by 5mg 4 hourly, bleeding generally stops in 6-12 hrs, but normal levels of coagulation factor are restored only after 24hr. This dose of Vit K will block anticoagulant action for 7-10 days
  - Moderate : 10mg i.m followed by 5mg once or twice according to response
  - Mild : Just omit a few doses of the anticoagulant.

367. (a) Polysaccharide
Ref: KDT 5th/e pg 561
- Heparin is a non-uniform mixture of straight chain mucopolysaccharide with MW 10,000 to 20,000. It contains polymers of two sulfated disaccharide units:
  - D - Glucosamine - L-iduronic acid
  - D - Glucosamine - D - Glucuronic acid
- It carries strong electronegative charges & is the strongest organic acid present in the body
- It occurs in mast cell as a much bigger molecule, loosely bound to granular protein. Thus, heparin is present in all tissues containing mast cells, richest sources are lungs, liver & intestinal mucosa.

368. (b) Small unionized molecule are not absorbed orally
Ref: KDT 5th/e pg 561 for a, 562 for b, 564 for c, 562 for d
- Heparin acts indirectly by activating plasma antithrombin III. Heparin AT III complex then binds to clotting factors of the intrinsic
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& common pathways & inactivates them but not factor VII a operative in the extrinsic pathway.

→ The anticoagulant action is exerted mainly by inhibition of factor Xa as well as thrombin (11a) mediated conversion fibrinogen to fibrin

→ Low concentrations of heparin prolong PTT without significantly prolonging PT. High concentrations prolong both.

→ Heparin at higher doses inhibits platelet aggregation & prolongs bleeding time

→ Heparin clears turbid post-prandial lipemic plasma

→ Heparin releases a lipoprotein lipase from the vessel wall & tissues, which hydrolyses triglycerides of chylomicron & very low density lipoproteins to free fatty acids, these then pass into tissue & the plasma looks clear. This action requires lower concentration of heparin than that needed for anticoagulation.

→ Heparin is a large, highly ionized molecule, therefore not absorbed orally

→ Heparin does not cross blood brain barrier or placenta

→ Protamine sulfate given IV neutralizes heparin weight for weight. However it is needed in frequently because the action of heparin disappears by itself in few hours

369. (c) Altepase
Ref: KDT 5th/e pg 570

Altepase

→ Altepase is a recombinant tissue plasminogen activator (rt-PA), produced by recombinant DNA technology from human tissue culture, it specifically activates gel phase plasminogen already bound to fibrin & has little action on circulating plasminogen

→ It is non antigenic, but nausea, mild hypotension & fever may occur

370. (c) 2b/3a receptor antibody
Ref: KDT 5th/e pg 573

→ Abciximab Fab fragment of a chimeric monoclonal antibody against GP II b/III a

→ Given along with aspirin + heparin during PTCA it has markedly reduced the incidence of restenosis, subsequent MI & death

→ Abciximab is nonantigenic, the main risk is haemorrhage, incidence of which can be reduced by carefully managing the concomitant heparin therapy, thrombocytopenia is another complication.

→ Constipation, ileus & arrhythmias can occur