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QUESTION 05
Anaes. Pharm

Describe the mechanism of action of protamine when used to reverse the effects of heparin. Outline the side effects of protamine

Protamine is a purified mixture of low molecular weight cationic proteins prepared from fish sperm. It is used to reverse the effects of heparin and to prolong the action of insulin.

Mechanism of action

It is a strongly basic compound which complexes with the strongly acidic compound of heparin to form an inactive salt which is subsequently removed by the reticuloendothelial system.

The intrinsic anticoagulant activity appears to be due to inhibition of the formation and activity of thromboplastin.

Side effects

Cardiovascular

Release of histamine from mast cells causes vasodilation and hypotension

Complement activation leads to decreased contractility

Pulmonary hypertension and acute right ventricular dilatation has been reported

The role of NO in these mechanisms remain controversial

Respiratory

Pulmonary hypertension and anaphylactoid reactions can lead to dyspnoea

Haematological

In high doses may have an anticoagulant effect

Many of these side effects can be reduced with a slow infusion of protamine