

Heparin neutralization test



Description, significance:

In order to decide whether a prolonged APTT or thrombin clotting time or a detectable anti-Xa activity was caused by heparins or by direct anticoagulants, an attempt can be made to neutralize heparin.

This can be achieved *in vivo* by intravenous administration of protamine. Protamine can immediately antagonize heparin, so a normalization of the thrombin clotting time after protamine administration is a proof for a heparin effect. One unit of protamine neutralizes one unit of heparin. However, it should be noted that protamine in excess also has an influence on the APTT (but not on the thrombin clotting time). Protamine also has a shorter half-life than heparin, so a heparin rebound can occur. In-vivo heparin neutralization with protamine is routinely carried out after cardiac surgery on the heart-lung machine. Even in patients with severe bleeding and an unclear medication history, the administration of protamine (if a heparin overdose is suspected as the cause of bleeding) can be both diagnostically and therapeutically advantageous.

In vitro, the heparin can be neutralized in the plasma sample by adding heparinase before coagulation analysis. If heparin was in the sample, the thrombin time, APTT and anti-Xa will normalize.

References:

Thomas L, Laboratory and Diagnosis, 2023, Release 5: <https://www.labor-und-diagnose.de/index.html>

Parameter catalog of the Clinical Institute for Laboratory Medicine, Med.Univ.Wien and AKH Vienna: <https://www.akhwien.at/default.aspx?pid=3982>

List of services for clinical chemistry, Univ.Klinikum Ulm: <https://www.uniklinik-ulm.de/zentrale-einrichtung-klinische-chemie/leistungskatalog.html>