Histaminase in Shock in Guinea-Pigs

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During the anaphylactic shock in guinea-pigs a very strong histaminase activity appears in the plasma. This is not the case in Forssman shock, whereas in the anaphylatoxin shock also a histaminase activity occurs, but of lower strength. Experiments showed that the liver is the main source of the histaminase. Antigen injected into the portal vein of sensitized guinea-pigs resulted in a strong histaminase activity occurring in the hepatic vein and this activity was inhibited by aminoguanidine. Since the histaminase appeared very quickly after the antigen injection we assumed that it is released from some sources in the liver. A constituent of liver cells other than histamine might be involved. It was soon found that heparin produced maximal release of histaminase and that the heparin-induced histaminase originated in the liver like in anaphylactic shock. There was no increased activity of plasma histaminase in a heart-lung preparation perfused with heparin-containing blood but as soon as the liver was included in the circulation activity occurred.

Of interest was the finding that protamine sulphate (an antagonist of heparin) also produced a strong increase in histaminase activity in the plasma of the intact guinea-pig. 5 mg protamine sulphate have the same effect as 50 units of heparin. However, heparin and protamine inhibited each other in these activations, 1 mg protamine neutralizing 50 units of heparin. Histaminase release may perhaps take place when heparin-like substances react with certain basic proteins in tissues, particularly liver tissue.