

## Action of cobalt compounds on vascular permeability, mast cells and blood clotting in rats and rabbits

Recently Mariano, Maria de Lourdes & others (1969) described a cobalt-induced immediate increase in vascular permeability of the rat skin, while at the same time the morphological aspects of the mast cells were not altered within 80 min after intraperitoneal injection.

In our experiments with Wistar rats the degranulation of peritoneal and tissue mast cells began 1 h after intravenous injection of cobalt(II) glutamate (1 mg Co/kg) (Fiedler & Hahn von Dorsche, 1969). The selective uptake and enrichment of  $^{58}\text{Co}$  by mast cells in rats were proved by autoradiography (Hahn von Dorsche & Fiedler, 1970). In spite of the degranulation of the mast cells neither thrombohaemorrhagic phenomena [subcutaneous injection of adrenaline, 0.25 mg/kg, 30 min before and simultaneous with the intravenous injection of cobalt(II) glutamate] nor acute conditioned necrosis (Selye, Rohan & others, 1966) could be produced.

In rabbits, rats and guinea-pigs, injection of cobalt(II) salts (2–5 mg Co/kg) alters the conformation of fibrinogen (Fiedler, 1969; Krantz, Fiedler & Lober, 1970). The prothrombin and thrombin time were much prolonged and the plasma formed a jelly instead of a normal fibrin clot (Taube, Fiedler & Hartmann, 1967). Spontaneous bleeding was not observed after a single injection of cobalt. But after repeated injections of cobalt(II) glutamate or cobalt chloride (5 mg Co/kg) subcutaneously in 10 h intervals the rabbits looked worse, refused food and showed diarrhoea. In such animals killed after 3–4 days we observed expanded bleeding regions in lung, pericardium and abdomen (especially in the liver), and suggillations in the subcutaneous tissue. Detailed histological experiments about the localization of the damage are in progress.

The application of cobalt(III) complexes did not disturb the blood clotting in rabbits. Otherwise the single injection of tris(ethylenediamine)cobalt(III) chloride and hexammino-cobalt(III) chloride (5 mg Co/kg subcutaneously) caused spontaneous bleeding in the abdomen. Similar experiences were reported from experiments in frogs (Oswald, 1922). The cause of the disturbed capillary permeability may be due to binding of cationic cobalt(III) complexes to anionic mucopolysaccharides of the connective tissue (Bychkov & Khazanova, 1965; Mathews, 1964).

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### REFERENCES

- BYCHKOV, S. M. & KHAZANOVA, A. I. (1965). *Biokhimiya*, **30**, 141–147.  
FIEDLER, H. (1969). *Medizin. Habil.-schrift*, Greifswald.  
FIEDLER, H. & HAHN VON DORSCH, H. (1969). *Acta histochem.*, **34**, 193–195.  
HAHN VON DORSCH, H. & FIEDLER, H. (1970). *Acta biol. med. germ.*, **24**, 529–533.  
KRANTZ, S., FIEDLER, H. & LOBER, M. (1970). *Ibid.*, in the press.  
MARIANO, M., MARIA DE LOURDES, B., DE MORAES, S. & PALERMO NETO, J. (1969). *J. Pharm. Pharmac.*, **21**, 709–710.  
MATHEWS, M. B. (1964). *Archs Biochem. Biophys.*, **104**, 394–404.  
OSWALD, A. (1922). *Biochem. Z.*, **127**, 156–167.  
SELYE, H., ROHAN, P. & PAHK, U. S. (1966). *Arch. exp. Path. Pharmac.*, **255**, 133–141.  
TAUBE, C., FIEDLER, H. & HARTMANN, N. (1967). *Acta biol. med. germ.*, **19**, 683–690.