THE HISTOCHEMISTRY OF THE PARATHYROID GLANDS OF GUINEA PIGS AFTER HISTAMINE APPLICATION

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The experiments were carried out on 60 mature male guinea pigs, randomly allocated into six groups (ten animals in each group). The guinea pigs of Group I (control) received intracardiac injections of 0.5 cm³ 0.9% NaCl instead of histamine, and the animals of the other groups received intracardiac injections of histamine. Half an hour before the administration of histamine, intraperitoneal injections of: mepyramine were given to Group III, ranitidine to Group IV, mepyramine and ranitidine to Group V, and ipratropium to Group VI. The animals from Groups II and IV, and the majority of Group VI showed symptoms of acute shock within 3-5 minutes of histamine administration. After decapitation, one lobe of the thyroid glands of the animals was taken, fixed in Bouin’s fixative, dehydrated, embedded in paraffin and cut into 10 μm sections.

On the sections where the parathyroid glands were present, we applied the techniques for analysis of protein gene product 9.5 (PGP), calcitonin (CT), neuropeptide Y (NPY), substance P (SP) and β-endorphin (βE). The second lobe of the thyroid gland of each animal was frozen, cut into 20 μm sections in the cryostat, and histochemical reactions were carried out for: acid phosphatase (AP), alkaline phosphatase (AlP), succinate dehydrogenase and monoaminooxidase (MAO).

An intensive reaction to CT was seen in some cells (probably the C-cells) of the parathyroid glands of the guinea pigs of Groups I and III. The immunoreactivity to this hormone was weaker after histaminic shock, which could be due to calcitonin secretion after [Ca²⁺]i stimulation, as C-cells express the calcium-sensing receptor. NPY was only found in the neuronal fibres, presumably in the walls of the arteries. The role of these regulatory peptides is to retard the growth processes and to diminish the secretion of some peptides, e.g. calcitonin and probably parathormone. Reaction to the SP was vestigial and immunopositive granules were only found in the neuron fibres. They were not different in the experimental and control groups. Reaction to βE was weak and granular in the parathyroid glands of Groups I and III, but in the shock, the reaction was stronger. PGP 9.5 was present in the parathyroid glands mostly in the neuronal endings. The histochemical reactions to LDH and MAO were intense and diffuse in the control groups, but in the shock were weaker.

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