MORPHOLOGICAL STUDIES ON JUXTAGLOMERULAR CELLS OF THE CHICKEN

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Morphology and distribution of the juxtaglomerular cells (JGC) of chicken kidneys were ontogenetically studied by light and electron microscopy.

In areas of the juxtaglomerular apparatus (JGA), JGC in variable sizes and figures, and containing several conspicuous granules confined by a thin limiting membrane, in addition to myofibrils in their cytoplasm, were detected. Fine structural analysis of these granules showed a considerable variety in their configuration, and they were fairly small as compared with those of mammalian species.

The following three types of JGC were classified in histological relation to the JGA, because they appeared not only in the glomerular arteriolar walls, but also in the vascular pole or mesangial regions. 1) Arteriolar type (A type: located at the walls of the glomerular arteriole). 2) Vascular pole type (V type: located at the paravascular pole). 3) Mesangial type (M type: located in the mesangial region).

There were few morphological differences between the granular characteristics of the three types of JGC ; however, it was noted that a few M types of JGC lost their myofibrils and close association with the neighboring basement membrane.

Ontogenetically, JGC were initially detected in embryos of 19 days of incubation, and their histoplanimetrical frequency was increased until the first day of posthatching life, although, a prominent decrease was characteristically estimated at the second posthatching day. Therafter, a constant increasing tendency of their relative histoplanimetrical values was observed. Concerning the frequencies estimated among the three types of JGC, from 1 to 15 posthatchig weeks, the relative frequency of A type of JGC was clearly decreased in contrast with that of M type.

These results suggest that chicken JGC may be characterized by an endocrine nature and possibly be able to respond to environmental physiological changes occurring during their latter half of embryonic and posthatching life.