

Adrenergic Innervation of the Spleen in Chicken

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INTRODUCTION

Following up our previous work on the morphological characteristics of the nerve supply into the primary and secondary lymphatic organs in mammals, we decided to investigate the adrenergic innervation of the spleen in chicken, i.e. organ that characterized by a number of systemic functions.

MATERIAL AND METHODS

The spleen has been examined in 12 chickens (3-4 months old). The adrenergic nervous profiles were demonstrated visualized by means of the verified histochemical method using glyoxylic acid modified by Shvalew and Zhuckova (1987). Microscopical examinations and photographic documentation were carried out on the equipment Jenalumar 2 (Zeiss, Jena).

RESULTS

The chicken spleen is a rounded, reddish-brown organ. It is situated very close to the portal vein in the region between the proventriculus and gizzard on one side and the dextral lobe of the liver on the other side. Although its microscopical structure is substantially similar to that of the mammalian spleen, i.e. consisting of connective tissue, the white and red pulp, the blood and lymph vessels and nerves, it shows a number of differences. While in mammals well-developed trabeculae pass from the fibrous capsule into the organ dividing its interior into smaller, mutually widely communicating spaces, in chickens these septa are only poorly developed or incomplete. Other special differences are that the border between the white and the red pulp is not well-defined in this fowl, including the considerably variable thickness of the generally poorly developed and some regions even missing periarteriolar lymphatic sheath (PALS) layer. The adrenergic nervous plexuses enter the organ in a common bundle with the arteries. In the organ they run through the fibrose trabeculae in the form of thicker periarterial

nervous plexuses. The density of this plexus is striking mainly on the longitudinal sections of the arteries, where thicker nervous fibres can be seen – sometimes also thinner bundles occur running parallel to the long axis of the arteries and arterioles or aa. centrales, as well as relatively thick nervous plexuses and individual profiles lying on the border of the two layers- the tunica media and the tunica adventitia. From the latter also thinner branches diverge passing into the adjacent tissue layers or as far as the white and red pulp. While as compared to the mammals the adrenergic innervation of the white pulp to an extent of that of PALS is somewhat poorer, the occurrence of periarteriolar and individual nervous profiles on the border of the white and red pulp is richer. Solitary profiles ramificate frequently forming even basket-like borders around the follicles. In addition to that, the presence of individual nervous fibres is observed also in the cords and sinuses of the red pulp. A relatively rich adrenergic innervation of the walls of the large and larger veins can be observed whereas the walls of the smaller venous branches are very poorly innervated. In the fibrous capsule of the organ strongly fluorescing periarterial and solitary nervous fibres occur, the connection of which with the trabecular and parenchymous nerves is evident on several sites of the organ.

CONCLUSION

Microscopical findings are in agreement with the opinion of the authors who state that the adrenergic nervous parts participate both in the regulation of arterial motion and in the regulation of the microenvironment in the parenchyme proper of this lymphatic organ.

REFERENCES

1. Shvalew, V N., Zhuckova, N. I.: An improvement in histochemical findings in adrenergic nervous elements in glyoxylic acid solutions with the aid of dimethylsulphoxide (DMSO). *Arkh. Anat.* 93, 1987, No 10, 91-92.