

LP-55 Stereological Parameters of Zona Glomerulosa after Octreotide Treatment

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Introduction The neuropeptide somatostatin is widely expressed both in the periphery and in the central nervous system. It has multiple functions: regulates endocrine and exocrine secretion, possesses antiproliferative properties and it acts as neurotransmitter/ neuromodulator by five distinct subtypes of receptors (sst1-5). Because of its ability to inhibit many functions of various organs, expectation was that somatostatin would be of therapeutic value[1]. Octreotide is a synthetic somatostatin analogue, more powerful than endogenous somatostatin. It has found clinical use in cancer therapy and in treatments of gastrointestinal and hormonal hypersecretory disorders [2]. Octreotide binds with high affinity to sst2 and sst5 receptors [3]. The examinations performed throughout present study were focused on stereological and functional parameters of zona glomerulosa after octreotide treatment.

Material and methods Wistar adult male rats were bred in controlled environment (12 h light/12 h dark; 22 ± 2 °C) with food and water ad libitum. The rats were divided into two experimental groups. Rats from the first group were injected subcutaneously twice a day with 20 µg octreotide per 100 g b.w. for 28 consecutive days. The second, control group was comprised of rats that were treated only with saline. All animals were killed under ether anesthesia 12 h after the last injection. The left adrenal glands were excised, fixed in Bouin's solution for 48 h, dehydrated and embedded in paraffin. Five µm thick adrenal sections were hematoxylin-eosin stained. In order to evaluate the volume densities of the zona glomerulosa (ZG), every tenth section of the gland was analyzed at 125x magnification with the multipurpose test system M_{42} [4]. The nuclear and cytoplasmic volumes of ZG cells were estimated under the light microscope at 1000x magnification with the M_{42} multipurpose test system. For each adrenal gland, a single paraffin section containing the zona medullaris was chosen and 30 test areas of the ZG were analyzed. Serum aldosterone levels were determined by aldosterone ELISA test. Duncan test was used for statistical analyses.

Results The relative volume of the ZG in octreotide treated group was significantly decreased ($p < 0.05$) by about 16%. Stereological analysis

showed that the volumes of the ZG cells and their nuclei in octreotide treated group were significantly decreased ($p < 0.05$) by 9% and 15% respectively. The serum levels of aldosterone significantly ($p < 0.05$) decreased by 19% in the octreotide-treated group (Fig. 1, Table 1).

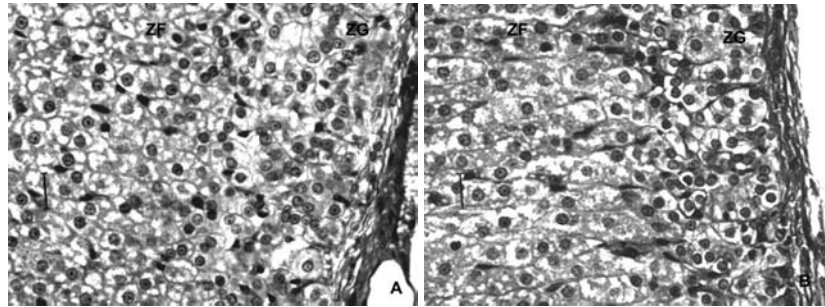


Fig 1. ZG and ZF A) control rats B) rats treated with octreotide. Bar, 20 μm , H&E (ZG – zona glomerulosa; ZF – zona fasciculata)

Table 1. Relative volume of ZG, volume of ZG cells and their nuclei, serum levels of aldosterone; (mean \pm SD; n=5); a, $p < 0.05$ vs. con

groups	relative volume of ZG (%)	volume of ZG cells (μm^3)	volume of ZG nuclei (μm^3)	serum levels of aldosterone (pg/lm)
control	11.7 \pm 0.5	909 \pm 16	100 \pm 2	132,9 \pm 9.5
octreotide	10 \pm 1 *	823 \pm 44*	85 \pm 1*	107.6 \pm 4,6 *

Conclusion These findings show that octreotide administration decreased both the morphologicalfunctional characteristics of the adrenal ZG.

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