

A Histological and Immunohistochemical Study on the Effect of Exogenous Melatonin on the Suprarenal Gland in Adult Male Albino Rats

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Abstract

Introduction: Melatonin is a hormone secreted by the pineal gland in the brain. It helps regulation of other hormones and maintains the body's circadian rhythm. There has been increasing evidence that extrinsic doses of melatonin cause certain biochemical and physiological effects on the suprarenal gland. However, the histological effects of exogenous melatonin on the adrenal gland have received little attention.

Aim of the Work: The present study was carried out to investigate, at the light microscopic level, the effect of exogenous melatonin on the suprarenal gland in adult male albino rats.

Materials and Methods: Twenty adult male albino rats were divided into two main groups (groups I and II). Group I (10 rats) served as control and group II (10 rats) was given melatonin daily in the morning for 2 weeks in a dose of 5 mg/kg orally. Histological (using H&E) and immunohistochemical studies {using anti caspase 3, anti chromogranin A (Cg-A) and anti neuron specific enolase (NSE)} were performed. Morphometric measurement of area % and optical density of caspase 3, Cg-A and NSE were done. Thickness of different regions was also measured. All measurements were followed by statistical analysis.

Results: Melatonin administration caused disruption of the arcuate pattern of the zona glomerulosa and marked disruption of the architecture of the zona fasciculata with severe disorganization in the arrangement of cells. Adrenal medulla showed marked enlargement, distortion and dilatation of the blood sinusoids. There were many epithelial giant cells near the blood sinusoids. Decreased area% of caspase 3 in the medulla, increased area percent and optical density of Cg-A and NSE immun-expression were found in the melatonin - treated group.

Conclusion: This study concluded various adrenal changes detected by histological and immunohistochemical techniques. The findings have clarified that exogenous administration of melatonin to normal rat may have an adverse effect on adrenal gland.

Key Words: Melatonin, suprarenal gland, Histology, Immunohistochemical, caspase 3, Chromogranin A, NSE

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