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Evaluation of histopathologic and histomorphometric changes of adrenal gland tissue following consumption of methylphenidate in male mice

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Background: One of the most common psychiatric disorders in children is ADHD (Attention Deficit Hyperactivity Disorder), which is treated extensively by Methylphenidate. This study investigates the assessment of the effects of methylphenidate on histopathologic and histomorphometric changes of adrenal gland and serum level of cortisol in male mice.

Material & Methods: In this study 30 adult male mice (Balb/C) were used. After determining the body weight, the animals were divided randomly into two experimental groups and one control group. The experimental groups received methylphenidate via gavage as follow: The group 1 received 2 mg/kg/day and the group 2 received 10 mg/kg/day for a period of forty days. After evaluation of body weight, general anesthesia was used for taking blood samples from the heart in order to measure cortisol levels in serum. After determining of body weight, Adrenal glands removed and its thickness of capsule, medulla and cortex were measured.

Results: The results showed that Methylphenidate with different doses could increase thickness of the glomerulosa and fasciculate layer, and decrease of the reticularis layer and capsule thickness in experimental groups significantly. Besides some significant changes in serum cortisol no significantly histopathological changes were seen in control specimens.

Conclusion: Our findings demonstrated that Methylphenidate administration in adulthood could affect cortisol hormones and adrenal gland tissue.

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