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Thesis Title	The Effects of Metformin and Anastrozole on the Morphology and Function of the Ovary in Polycystic Ovarian Syndrome Rat Model, Morphometrical, Histological, and Immunoistochemical Study		
Year	2015		
Abstract	<p>Polycystic ovary syndrome (PCOS) is one of the commonest female endocrine disorders that negatively affects her reproductive life & fertility. The etiology & pathogenesis of PCOS are still incompletely understood. Researches are continuously shading lights on the mechanisms that may be involved in the development of the disorder, & potential treatments for the different aspects of it.</p> <p>The current animal study was designed to investigate prepubertal androgen exposure as a possible etiological factor in the future development of PCOS, and to examine the effects 2 medications, metformin and anastrozole, on the anatomical, histological, and histochemical parameters of the ovaries of PCOS rat model.</p> <p>Forty two prepubertal female albino rats were divided into 2 unequal groups: the larger group (n=30) received daily subcutaneous injections of testosterone propionate to induce PCOS, & the smaller group (n=12) served as the control group of the first stage & received no hormone. PCOS was confirmed after 4 weeks in the treated group, which was then subdivided into two equal subgroups (n=12 for each) & started the second stage of the study. One subgroup received daily oral metformin, & the other subgroup received daily oral anastrozole. The remaining control animals of the first stage continued as the control group of the second stage, which had no oral treatment. The oral treatment lasted for 5 weeks. Body weight record was performed weekly throughout the whole study period. After completing the second stage, all of the animals were sacrificed & their ovaries were harvested & subjected to morphometrical, morphological, histological, & immunohistochemical studies.</p> <p>The parameters investigated in this study were body weight, ovarian</p>		

weight, ovarian external appearance, surface area of the largest ovarian section, the number of different stages of ovarian follicles & corpora lutea, thickness of theca interna, & the percentage of interstitial glands from the ovarian stroma. In addition, the immunohistochemical expression of iv aromatase enzyme & estrogen receptor beta was investigated in the above mentioned ovarian tissues.

Testosterone propionate resulted in a significant increase in body weight compared with the control group, reduction in ovarian weight, reduction in the total number of different ovarian follicles, increase in the number of small cysts, & absence of corpora lutea that indicated ovulatory failure, in addition to reduction in the overall ovarian expression of aromatase enzyme. Metformin resulted in body weight loss, reduction in the number of small ovarian cysts, & sporadic cases of ovulation evident by corpora lutea development in few ovaries. Metformin had a limited effectiveness in reversing the other ovarian abnormalities induced by testosterone treatment. On the other hand, anastrozole resulted in resumption of normal ovarian weight, effective ovulation evident by large number of corpora lutea, & significant improvement regarding the number of different ovarian follicles. Anastrozole could also resume the ovarian expression of aromatase enzyme, & resulted in an overexpression of estrogen receptor beta in the main ovarian components. Anastrozole had maintained the body weight gain that resulted from testosterone treatment.