The study was conducted to investigate the effect of oxytocin on the activity of the female reproductive system especially ovulation induction. Animals used in the study were female immature rats (N=20). They were injected subcutaneously twice daily at three-hour intervals for two days either on the 38th or 39th days of age with oxytocin at a dose level of 100 mIU/10 gm body weight. Treated animals were left for two days after completion of the hormonal administration and were injected intraperitoneally with the same dose of the hormone (3 times) at one-hour intervals on the third day, then they were divided into two groups. Group I was left 3 days and sacrificed on the 4th day, while animals of the second group (initially treated on the 38th or 39th day of age) were left for 2 more days and sacrificed on the 48th or 49th day of age, respectively. Animals of the same age treated with saline through the same route and time of sacrifice as the case was with the treated animals served as control. To check whether ovulation and receptivity to mating, treated animals were kept when they were at the 44th or 45th day of age respectively for 48 hrs with adult known fertile males. The following changes in the reproductive system were also followed: Age of vaginal opening appearing, changes in vaginal smears, appearance of vaginal plug (induction of mating), oviductal flushing, quality of ova (if present) ovarian and uterine weight changes to gather with induced structural changes in them were also performed. Serum gonado tropin (FSH, LH) level was as measured using radioimmuno assay. Results indicated that vaginal opening and presence of proestrus phase was obtained on day 45th and 46th of age for rats treated with the hormone on day 38th and 39th respectively, in the next day, vaginal smears...
showed presence of estrus phase for those treated on day 38\textsuperscript{th}, and presence of metestrus phase with the appearance of large number of sperms in rats treated on day 39\textsuperscript{th}. Smears prepared in subsequent two days showed continuation of normal estrus cycle in treated rats of both ages. Rats sacrificed on the day 48\textsuperscript{th} showed diestrus phase and these sacrificed on the day 49\textsuperscript{th} showed proestrus phase, while smears of the control exhibited no cyclic changes with absence of vaginal opening. Ovulation induction in the treated rats verified by the presence of ova in the oviductal flushing media when rats were killed on the day 46\textsuperscript{th} and 47\textsuperscript{th} of age respectively. Corpus lutea were noticed in subsequent days (48\textsuperscript{th} and 49\textsuperscript{th}). Microscopic examination of obtained ovum indicated that they were abnormal (absence of first polar body, cytoplasmic fragmentation … etc), microscopic examination of the genital system of the treated rats revealed generalized congestion. Weight changes in the treated rats included significant (p<0.05) increase in ovarian and uterine weights were noticed in most of the treated rats. Structural changes, ovarian and uterine conform with the discussed changes. Number of growing and mature follicles increased significantly (p<0.05) in all treated rats and non significantly in their dimensions (except those sacrificed on day 49\textsuperscript{th} where the increase was significant in both parameters). Corpus lutea appeared in all treated rats starting from day 47\textsuperscript{th} their dimensions in the treated rats sacrificed on day 47\textsuperscript{th} was clearly higher than others. Uterine structural changes included also significant (p<0.05) increase in the height of endometrial epithelial lining cells especially those sacrificed on day 47\textsuperscript{th}. Endometrial thickness showed a significant (p<0.05) increase in all treated rats except those killed on day 47\textsuperscript{th}. Treated animals sacrificed on day 47\textsuperscript{th}. 48\textsuperscript{th} of age showed a significant (p<0.05) increase in the uterine gland diameters as compared with control. Gonadotropin (GT) hormones serum levels (FSH & LH) showed a significant increased in all treated rats as compared with the control. These result clearly indicate that oxytocin injected into immature female rats has the ability to stimulate ovarian and uterine growth and function to the extent of induction precocious puberty with ovulation occurring at 46\textsuperscript{th} days of age when treated initially with hormone on day 38\textsuperscript{th}. Animals killed on day 47\textsuperscript{th} of age showed mating behavior (presence of vaginal plug) and stimulate of pseudopregnancy, i.e presence of active corpus lutea coupled with absence of embryos, signs of sexual puberty continuation for subsequent days (48\textsuperscript{th} & 49\textsuperscript{th}). The mechanism of oxytocin effect may have been through stimulates of GT hormones and consequently ovarian and uterine stimulation.