Oxytocin (syntocinon) as stimulating factor for ovulation and uterine, mammary glands and placental development in white female mice

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Abstract
The effect of oxytocin were studied as astimulating factor on ovulation, In this study 30 female mice were carried out on 2-3 months old with 24-30 g weight, They were distributed of two groups the control and experimental, The white mice in experimental group were injected with adose of 10 IU/g of oxytocin at proestrus phase. The results showed that the pregnancy ratio in the experimental group was about 64% and the born ratio was about 59% which were higher than the control group and the weight of newborn pups was more than the control. Histologically, In the ovarian section there was more follicles in different stages development in experimental group when the endometrium of uterus was thicker than the control and about the mammary gland section there was increased in alveolar surface area, In addition the results showed that oxytocin affected on placenta, It appears larger and thicker in the cross sections for experimental group.
Key words: oxytocin, ovulation, endometrium.

الاوكسيتوسين (معجل الولادة) كمحفز للتبويض وتطور الرحم والغدد اللبنية والسخد والحمل في إناث الفئران البيض

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الملخص
درس تأثير الاوكسيتوسين كعامل محفز لعملية التبويض في هذه الدراسة إذ استخدمت 30 من إناث الفئران البيض بعمر 2-3شهر ووزن 24-30غم،وزعت الفئران الى مجموعتين سيطرة ومجموعة اختبار،الفئران البيض في مجموعة الاختبار حقنت بجرعة 10وحدة دولية/غم من الاوكسيتوسين لمرة واحدة وقت التبويض. أظهرت النتائج بان نسبة الحمل في مجموعة الاختبار كانت 64% ونسبة الولادات كانت 59% والتي كانت أعلى من مجموعة السيطرة ووزن الفئران المولودة كان أيضا أعلى من مجموعة السيطرة. نسجيا، في مقطع المبيض تظهر الحويصلات بأطوار مختلفة من النمو والتطور في مجموعة الاختبار وكذلك بالنسبة لبطانة الرحم فهي اسمك من مجموعة السيطرة،أما بالنسبة للغدد اللبنية فقد كانت هناك زيادة في المساحة السطحية للحويصلات، بالإضافة إلى ذلك أظهرت النتائج أن الاوكسيتوسين يؤثر على السخد فقد ظهر اكبر واسمك في المقاطع العرضية لمجموعة الاختبار.
مفتاح البحث :اوكسيتوسين، تبويض، بطانة الرحم.

Introduction

The hypothalamus is synthesized and regulate hormones in the body so that modulate the communication in the cells and the functions of body. The hypothalamus produced hormones like oxytocin which contains a leucine and tyrosine at position eight and two. The magnocellular neurons is synthesized neurohormone which located in supraoptic (SON) and nuclei by paraventricular (PVN) of hypothalamus (Gimpl and Fahrenholz, 2001). Oxytocin injection (Bolus particle) is available in ampoules contained 3 I.U. (5.00 µg/ml (Russell, J.A.et al,2003). The active principle of oxytocin injection is stimulating effect on the smooth muscules of the uterus, particularly about the end of pregnancy, when the number of the specific receptors of oxytocin in the myometrium will be increased.Injected of oxytocin may be used for induction of labour for stimulated medical reasons of hypotonic labour uterine inertia during the section of caesarian following the delivery of the child prevention of the child and treatment of the uterine postpartum atony and haemorrhage. injection of oxytocin may be indicated in pregnancy at early stages as an adjunctive therapy for the incomplete management, missed abortion or inevitable. (Vrachnis N., et al,2011) The oxytocin in a low concentration (0.2 nM) induced developmental phasic tension in the uterus. Higher concentrations of oxytocin induced tonic spasm. (Edwards,D.M.et al,1986) Oxytocin produced contractions of uterus and ejection of milk, functions that related to parturition , nurturing. Studies were determined if this peptide, native to the posterior pituitary gland also the brain, induction the maternal behavior. In female rats oxytocin would be displayed full maternal behavior towards foster pups(Cort A.et al,1979) corpus luteum will be synthesized by oxytocin and the endotmetrial epithelial cells too(Gerald G.&Falk F.,2001) oxytocin could be involved in the development of follicles (Mass S.et al,1992) (Einspanier A.et al,1995) There are evidences that oxytocin has regulate LH releasing (Evans J.et al,2013) (Hull M.et al,1995) and secretion of progesterone (15,17) Futhermore its effect on development of follicles and their ovulation(Tallam S.&Walton J.,2000)(King P.& Coetzer W.,1997). The involution of the lactating rats mammary glands, which normally follows suckling of the cessation, It was retarded over a period about 9 days according to administered the oxytocin to mothers, following the litters will be removal on the 4th day of retardating lactation of involuted mammary gland that will be obtain with oxytocin according to anterior pituitary gland absence.(Schmidt G.H & Hansel W.,1961) In addition of oxytocin and somatotrophin estradiol and progesterone injections caused an effect decrease in the alveolar surface area and milk production of virgin yearling goats in a comparative with estradiol and progesterone alone. (Schmidt G.H & Hansel W.,1961) The oxytocin effects on fetal and the growth of placenta and on weight gain of mums and fat accumulation of the body were observed in pregnant rats. Further, pregnant rats which treated with oxytocin had in the end of pregnancy less body fat and largest fetuses, placentas, and newborn pups (Sohlstrom A et al,1999).

Materials and Methods

This study was carried out on 60 mice (female and male), 2-3 months old and were used with 24-30 g weight, During

period extend from March 2016 up to July 2016,The mice were used at proestrus phase,They were distributed into two groups the control about 30 mice and experimental about 30mice,The experimental mice were injected with 10 IU/g oxytocin (Robinson et al,1992) We purchased the oxytocin from pharmacy as avail 1mm as syntocinon (10 IU from,NOVARTIS) The mice (5control,10 experimental) were sacrificed after 48 hours of the injection according to their estrous cycle and the same number to get pregnant,Reproductive organs sample were removed to preparation of slides chose the paraffin embedding method.

Results and Discussion

The results of this study showed that the pregnancy ratio in the experimental group was about 64% which was higher than the control group and born ratio was about 60%(Table1)when the weight of the newborn pups and the numries of their was more than the control group(Table2) In the ovarian sections of the both groups showed the follicular quality which including primary,secondary and antral follicles at different stages development it is shown that there is asimple different regarding the number of follicles which were increased significantly in experimental group comparative with control group as indicated in table 3,This result indicate that oxytocin effected on the follicles number which agree with our findings (Wramsby et al,1987) who shows oxytocin that could affected on maturation of oocyte and the rate of pregnancy.

Table (1):- Show the pregnancy and born ratio in the two groups

	Pregnancy%	Born%
Control	55	53
Experiment	64	59

Table (2):- Show the number and weight of the newborn pups

	Number	Weight g
Control	3-6	1.73
Experimental	5-8	1.76

Table (3):- Show the number of different follicles in two groups at follicular stage.

Follicular stage	Control	Experiment
Primordial follicle	64.30±5.2	76.13±4.69
Primary follicle	143.48±29.08	165.66±21.82
Secondary follicle	363.63±50.04	365.008±56.75
Antral follicle	99.74±21.49	111.82±34.78

Histologically, Fig(1)showed section of ovary included big follicles in different stages from experimental group, which agreement with (Roshangar et al,2009) who recorded the bigger follicles in ovary sections were removed from experimental mice. Oxytocin as anatural hormone have receptors and the reproductive organs is synthesized it. Preovulatory presence of the receptor of oxytocin in granulose cells indicating arole to oxytocin in developmental follicles. Fig(2) showed section of uterus determination of endometrium in experimental group was thicker than the endometrium of control group this agreement with (Roshangar et al,2009) who found the thick endo metrium in the mice of experimental group. Oxytocin induction of ovulation and endometrial thickness increased and stimulated implantation. Fig(3) showed section of mammary gland appear the increased of total alveolar surface area this gives an indication that the oxytocin enhance the change of growth and development of the mammary glands of the female mice. This findings agreement with Schmidt G.H. and William H. (1961) who finding the alveolar surface area increasing in the mice which treatment whith oxytocin Fig(4) showed the effect of oxytocin on the growth of placenta Further, a possible role of the assessed changes of induced oxytocin. oxytocin-treated pregnant mice had larger placentas and much thicker which agreement with Sohlstrom A et al (1999) who discovered the same results which were more placental growth and bigger comparative with control group.

Fig.(1):-Section of ovary show big follicles, (experi. group) (H&E)100X

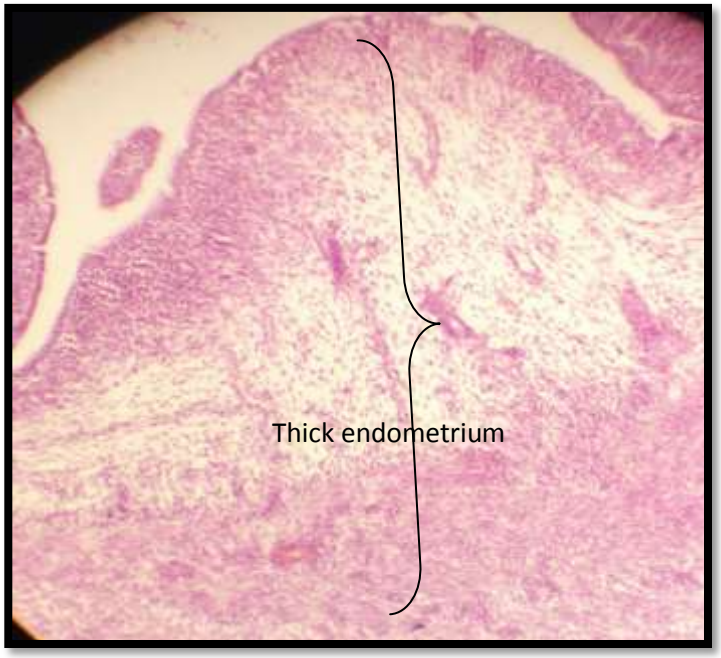


Fig.(2):-Section of uterus show thick endometrium, (experi. group) (H&E)100X

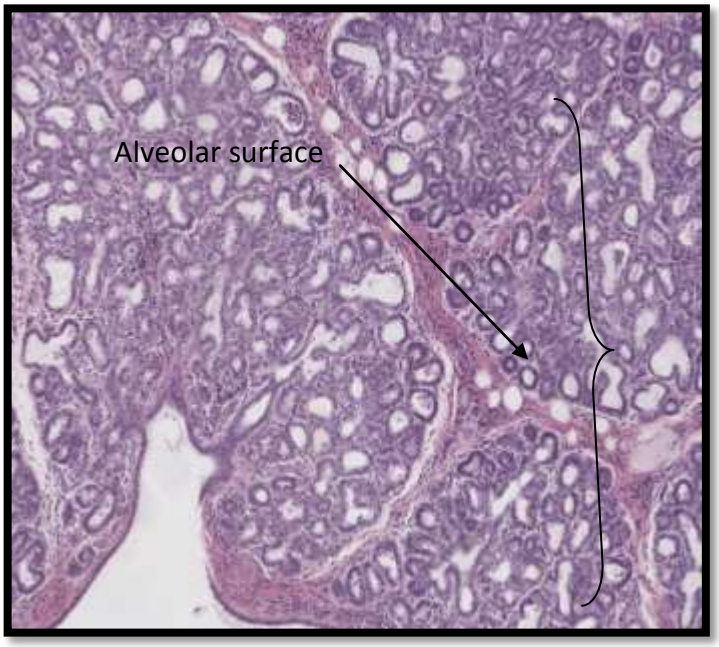


Fig.(3):- Section of mammary gland show alveolar Surface area, (experi. group) (H&E)100X

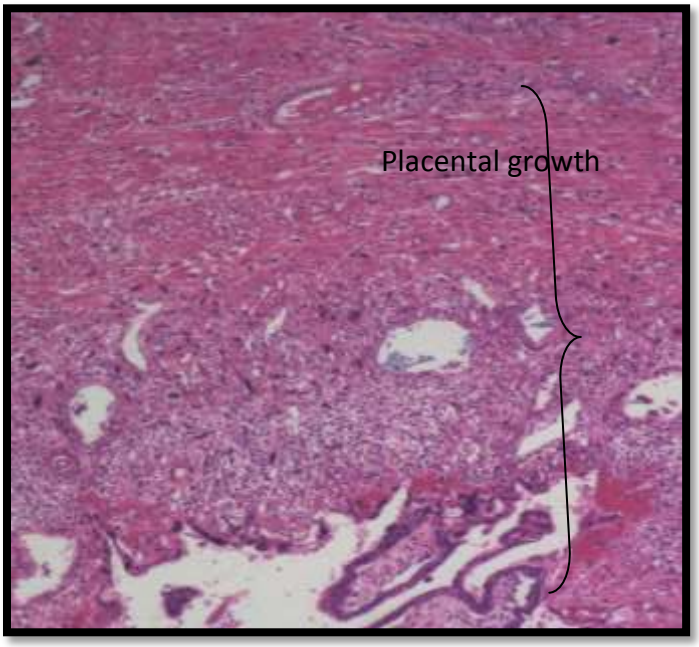
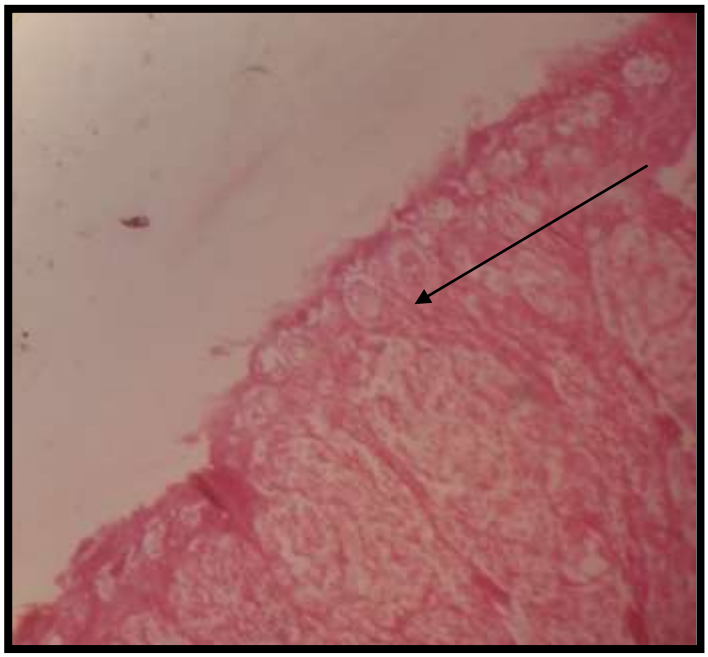
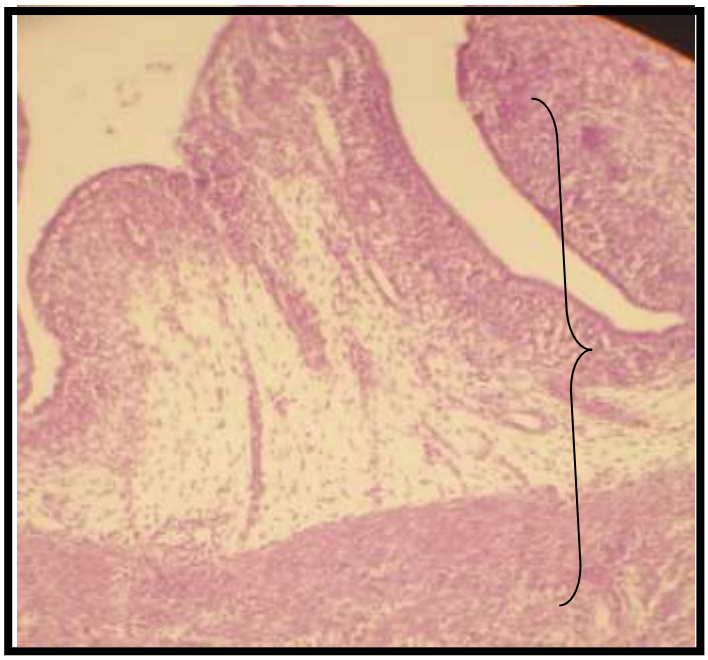


Fig.(4):- Section of placenta show the well growth, (experi. group) (H&E)100X



Small follicle

Fig.(5):-Section of ovary show small follicles, (cont. group) (H&E)100X



Thin endometrium

Fig.(6):- Section of uterus show thin endometrium, (cont. group) (H&E)100X

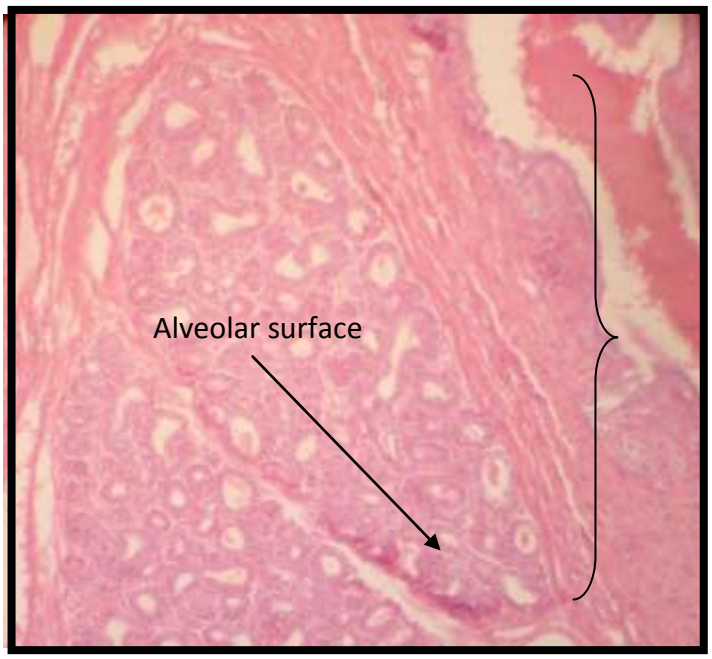


Fig.(7):-Section of mammary gland show alveolar area, (cont. group) (H&E)100X

Fig.(8):-Section of placenta show the normal growth, Surface (cont. group) (H&E)100X

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