

# **Histomorphological effects of Aspirin on the female Reproductive organs of rats treated**

**Dr. Nuha SH. Ali**

Dentistry Col.

AL – Qadyssia Uni .

## **Summary**

This Study was used (21) matured female albino rats weighting between (150 – 170) gm , that divided for three groups randomly , first group depended as a control , and the second group treated by aspirin by using the low dose (10 mg each ml Bw) during 15 day , and the third group treated by the same dose for 30 day .

Aqueous diluted aspirin was administered orally for and used . Distilled (0.05 ml) ,to group of control.

This study showed that low dose aspirin therapy has added varies effects on ovarian and uterine tissue which treatment in two difference timer , thus showed in treatment group for 30days,explain congestion occurs and hemorrhage on in some area of uterus wall , but not explain histological changes in endometrium cells also uterine glands but showed smooth muscles atrophy in myometrium layer . In section of ovaries showed congestion and cystic appearance due to presence of corpora lutea , also increase of the granulosa cells and increase in number of growing follicles but decrease in follicles maturation.

## **Introduction :**

Aspirin was the first discovered member of the class of the non – steroidal anti – inflammatory drugs , and acetylsalicylic , used as an analgesic to relief minor aches and pains (Gilman *et al.* , 1990 / Klaassen , 2001 , Gaciong , 2003) .

It also has an antiplatelet effect which in long time and low dose can prevent heart attacks and thrombus formation in hyper coaguable states e.g , cancer , anothor side – effect , due to its anticoagulant properties , is increased bleeding in menstruating women (Adegoke,1994) .

Aspirin (non – steroidal , consistently inhibit ovulation in all mammalian species investigated , likely due to the inhibition of Cyclooxygenase 2 (COX – 2) because COX – 2 inhibition has major effects on ovulation , fertilization and implantation . (Gaytan *et al.* , 2006) .

## **Material and Method**

This study was used (21) matured female albino rats weighing between (150 and 170 g) .

Preparation of drugs , Aspirin (400 mg) was weighed and dissolved in 100 mL .

Experimental procedure : the rats were randomly divided into (three group) , 7 rats each group .

- Control group served as the control group and were administered normal saline for (30 days) .
- treatment groups : second group (7 rats) received 10 mg kg<sup>-1</sup> body weight of aspirin respectively for 14 days .
- Third group (7 rats) received 10 mg kg<sup>-1</sup> body weight of Aspirin respectively for 30 days .
- Histological preparation : At the end of the experimental period of (15 , 30 days) , by using chloroform and midline incision carried out to obtain the ovaries , uterine tubes , and uterus the organs obtained where then fixed in formalin 10% and processed for paraffin sections , sections were stained with haematoxylin and eosin and mounted in canada balsam by light microscopic examination of the section (Olympus) then photo slids by digital camera .

## **Results :**

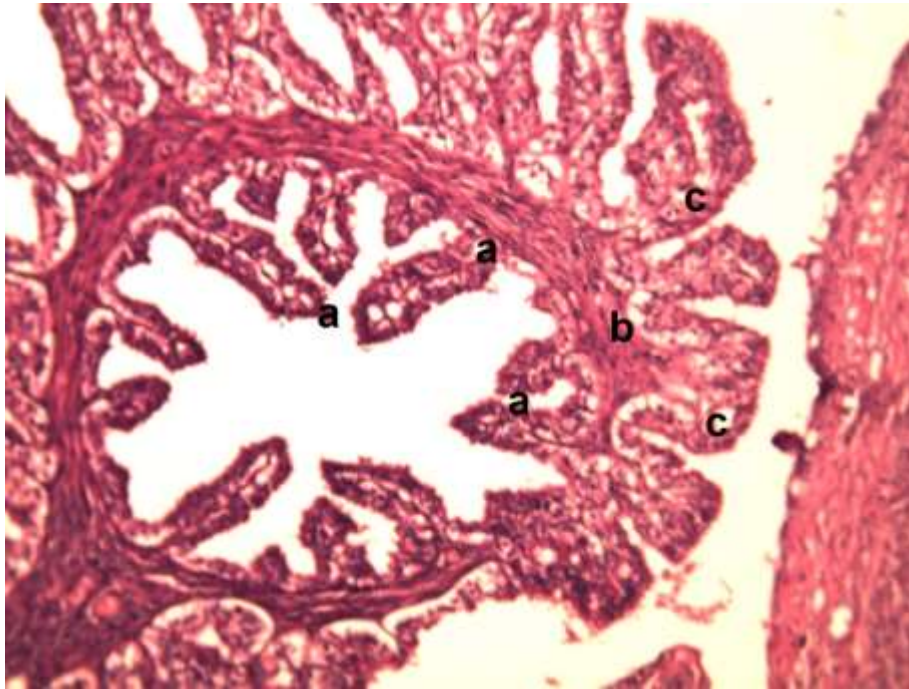
Showed the section of ovary has two parts outer part (cortex) filled with various stages of follicles development and the medulla showed connective stroma with scattered blood vessels (fig1), Either the mucosa uterine tube showed covered by simple ciliated secretory epithelium which was thrown into fold, their fold were more pronounced at the region of fimbria and has layers of smooth muscles and richly supply with blood and lymphatic vessels. (fig2)

While the mucosa of uterus had layers of endometrial stroma lined by simple columnar epithelium supported by lamina propria, from loose connective tissue which rich with large number of uterine glands, and myometrium composed of masses of smooth muscles richly supply by blood and lymphatic vessels. (fig3)

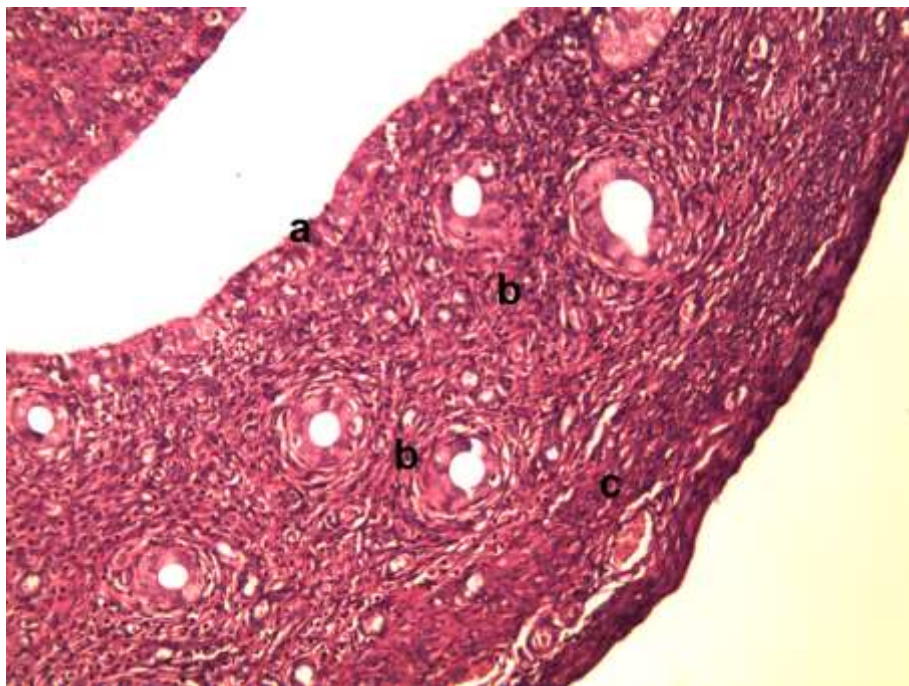
The samples of ovaries rats treatment showed congestion, cystic appearance due to the presence of some corpora lutea, and increase of the granulosa lutein also. showed increase in number of growing follicles (fig6,9).

In samples of Uteri rats treatment showed especially in group of long treatment, appearance of congestion and hemorrhagic area on the some position of endometrium of uteri, uterine vascularization wall but no showed significant histological changes in the high of the endometrial lining cell or thickness, only observed less regularization of endometrial lining cells of uterine tube (fig4,5), increase number ducts uteri glands, also showed decrease in thickness

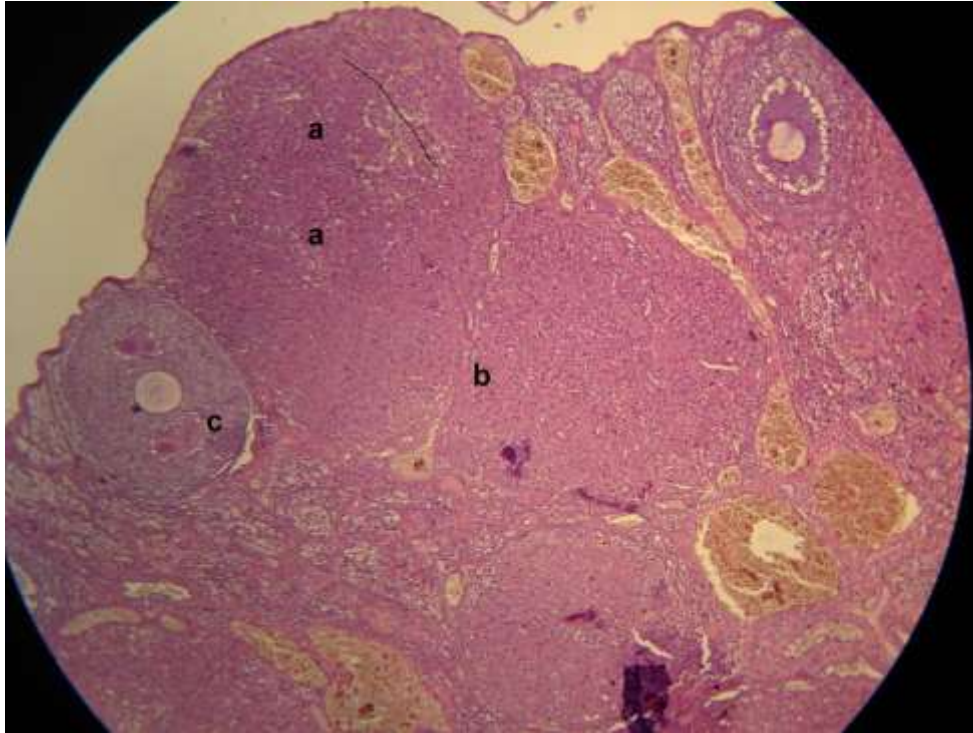
of myometrium especial in group long time treatment for (30 days) induced vasoconstriction and smooth muscles atrophy fig(7,8).



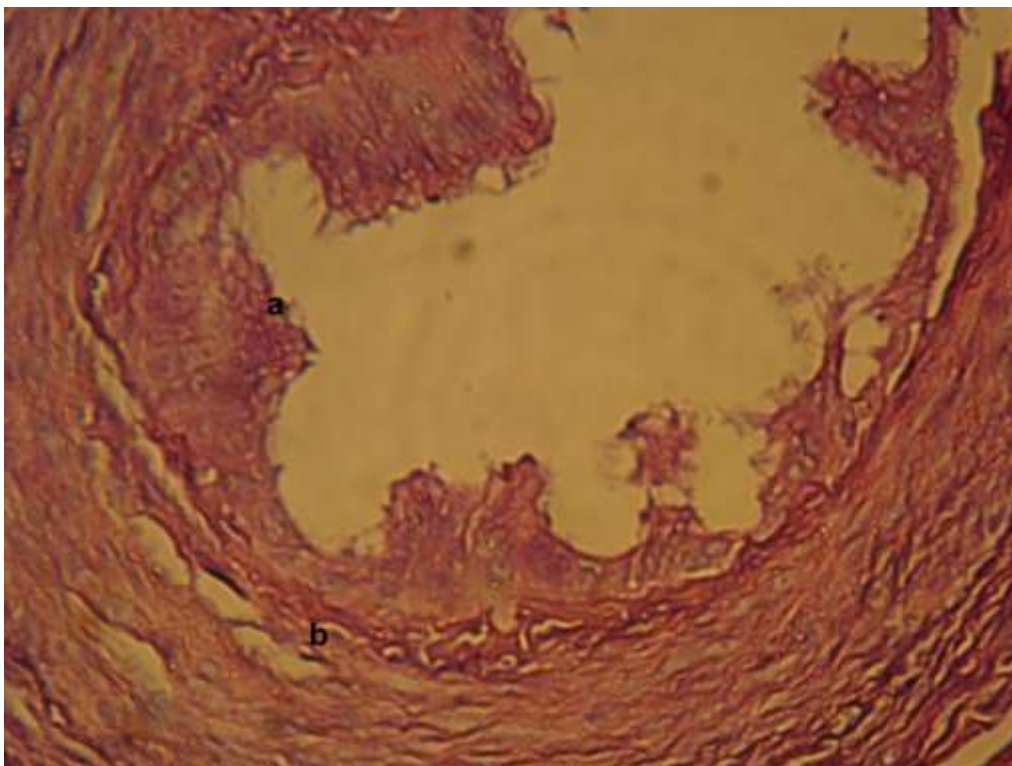
Fig(1)explain the uterine tube section of control : a- mucosal lining epithelium tissue ,b-muscles layers ,c-serosa (H&E400X).



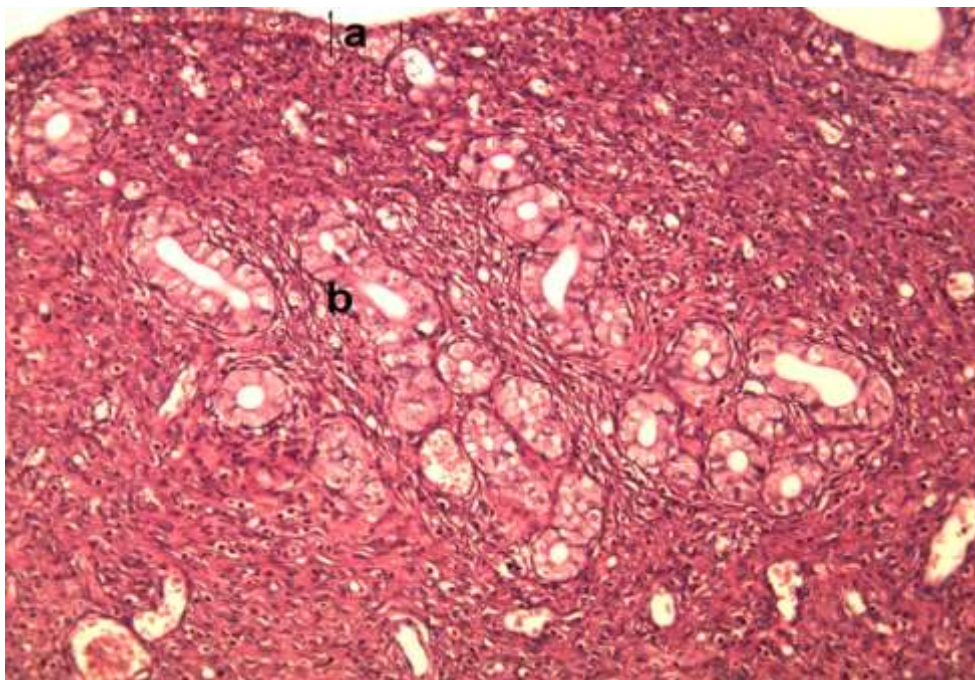
Fig(2)explain the uterus control section: a-endometrial lining epithelium cells ,b-submucosa connective tissue with ducts of glands ,c-muscles layers(H&E100X).



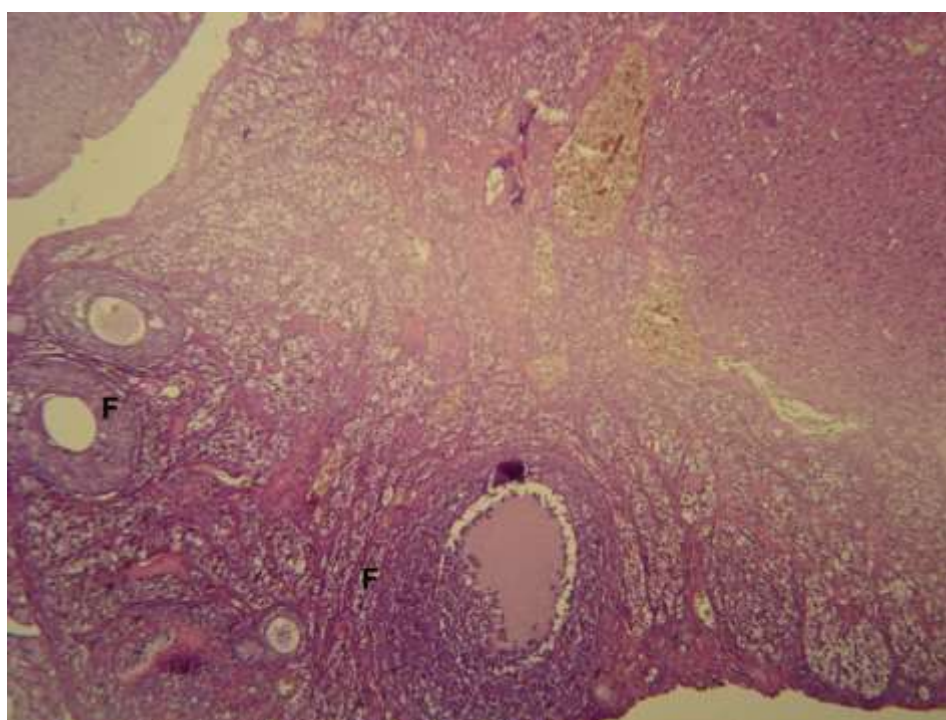
Fig(3)explianing ovary control section:a-cortex ,b-medulla,c-follicles(H&E100X).



Fig(4)explain the uterine tube of aspirin(15days) treated groupsection;a-irregular lining epithelium of mucosa ,b-vasoconstriction &atrophy musules(H&E400X).

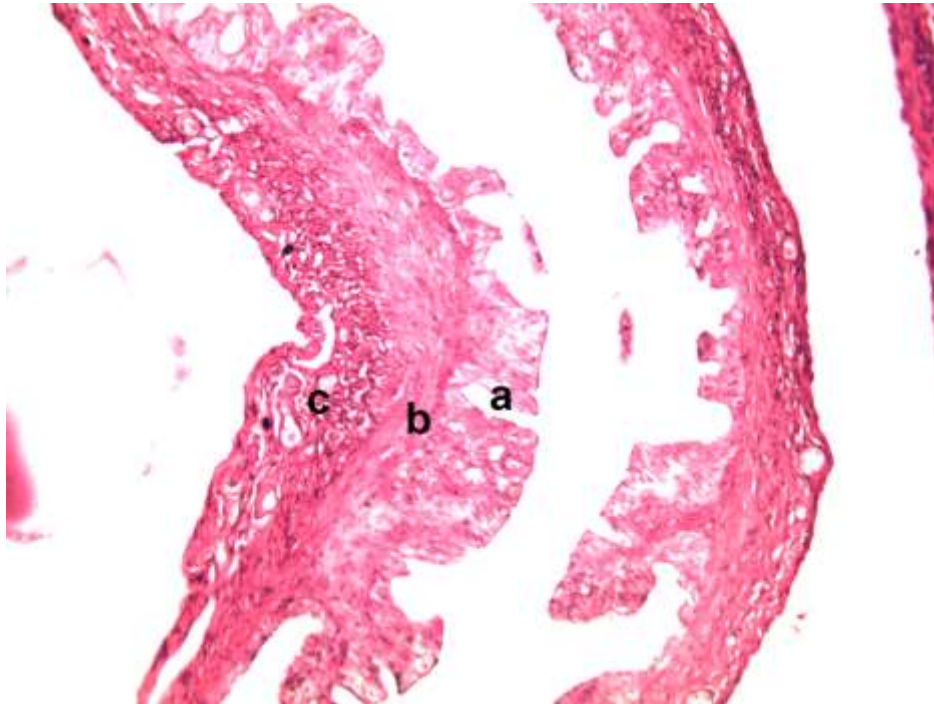


Fig(5)explain the uterus of aspirin (15days)treated group ; a-low mucosa epithelium cells ,b-elongated and increase number ofducts glands of submucosa (H&E100X).

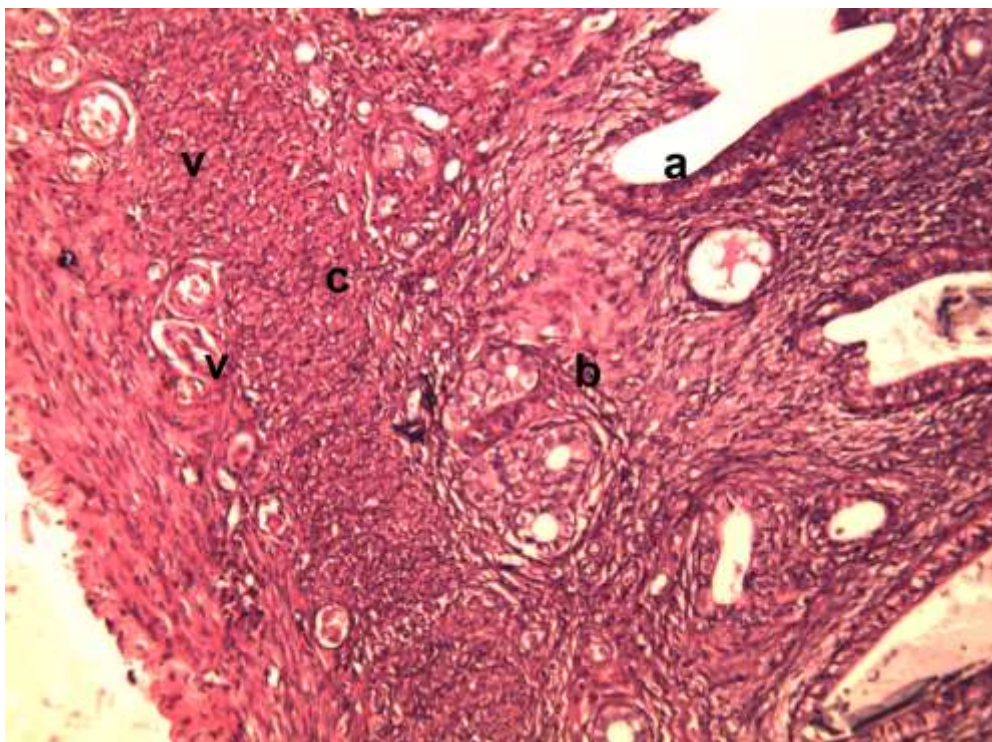


Fig(6)explaining the ovary ofaspirin(15days)treated section:F-follicles with large number resulte high vascularisation(H&E200X).

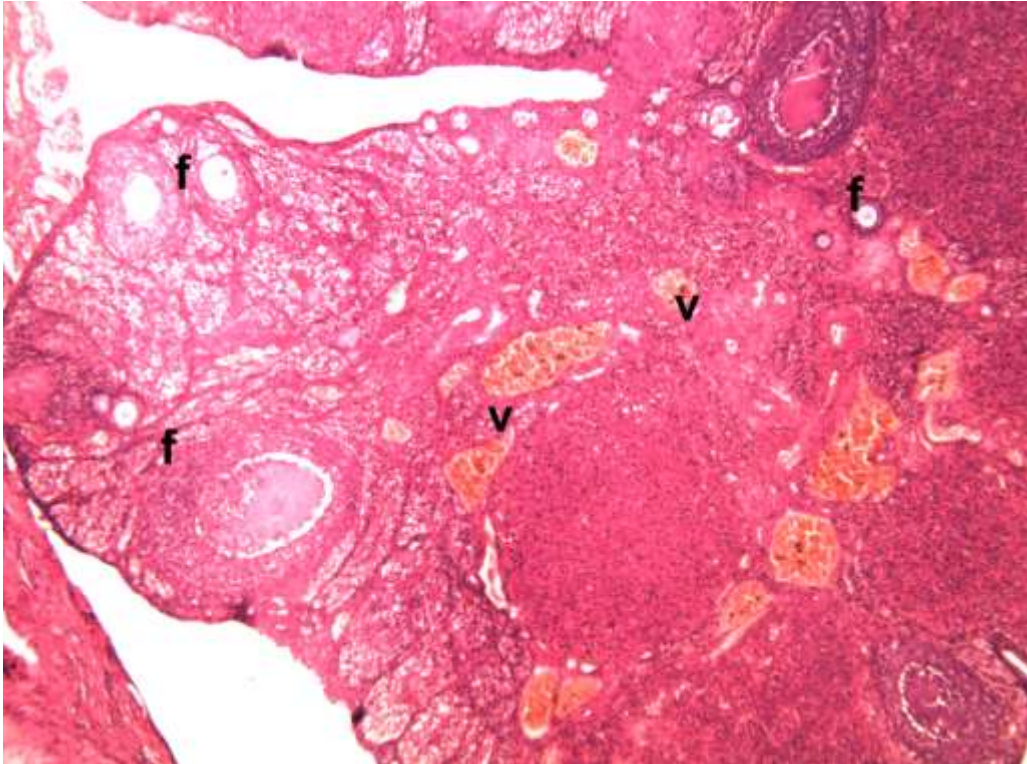




Fig(7)explaining the uetrine tube of aspirin(30days)treated section;airregular epithelium cells of mucosa,b-atrophy of musles layers,c-high vascular(H&E200X).



Fig(8)explian the uterus of aspirin(30days)treated section:a-low epi.of mucosa,b-sub mucosa connective tissue with enlargment of ducts glands,c-ahighly atrophy of myometrium,v-highly vascularization(H&E400X).



Fig(9)explain the ovary of aspirin(30days) treated section : F-highly number of growing follicles, v-vascularise of blood vessels(H&E200X).

## **Discussion :**

The histomorphologically changes in rates reproductive organs beined to the role of Aspirin which used as a pharmacologic material , It is an inhibitor of the enzyme cycloooygrase . In blood platelets this enzyme prevents the synthesis of thromboxane a compound which is a vasoconstrictors,causes plate aggregation and thus potentially thrombotic (*Kathleen,1999*) thus the low dose aspirin treatment , causes platelets aggregation and vasoconstriction may be avoided which in turn may improve folliculogenesis and increase the number of oocytes (*Gaytan et al.,2006*)(*Gociong,2003*).

Aspirin and related anti – inflammatory agents have been reported in delaying the onset and prolongation of duration of parturition in rat and other animals (*Williams et al. , 1974*) ,in uterus these drugs were effected to inhibit prostaglandins (PGs) play an important role in parturition (*Kuo-Hc et al.,1997*)(*Rubinstien et al.,1999*).Some researcher were explaining endogenous PGs act directly on the myometrium to stimulate contractions , while another suggestion say that PGs act indirectly via ovaries to causes luteal regression and decrease in plasma progesterone levels with subsequent enhancement of uterine contractions that agreed with(*Weksler et al.,1983*)(*Ganong,2003*)

Also the increase in blood flow velocity in the uterine tube and ovarian arteries because of the aspirin have paradoxal biological

effects , both antithrombotic and thrombogenic as researcher(Abatan I *etal.*,2006)and(Gaytan *eta.*,.2006).

Vascularization of the follicle may play a role in it's maturation from the early follicular phase thus increase the number of growing follicles . Aspirin seems to increase this vascularization because of a vasodilatation effect that could result in preferential delivery of gonadotropin hormones or other growth substances required for steroid genesis .(Ganong,2003) and (Skomsovl *etal.*,.2005)

Explain from this study that vasoconstriction and smooth muscles atrophy observed in group of long time aspirin treatment , because the aspirine as cause to led to reduction in the contraction of these smooth thus dueto causes reduction inuterine contraction, that agreed with some views as ( Wada *etal* 1994) and (Rubinstent *etal.*,1999).

## Reference :

- 1- Abatan , M . O . I . Lateef and V . O . Taiwo , 2006 . Toxic effects of non – steroidal anti – inflammatory agents in rats . Afr . J . Biomed . Res . , 9 : 219 – 223 .
- 2- Aegoke,O.,1994.Effect of indomethacin andAspirin on pregnancy in rat.nig.med.practioner,17:66-68
- 3- Ganong WF . Review of medical Physiology . A LANGE Medical book , 21 ed . , McGraw – Hill , 2003 .
- 4- Garcia – Rodriguez LA . The effect of non steroidal anti inflammatory drugs on the risk of coronary heart disease Clin Exp Rheumatol 2001 ; 19 (6 suppl . 25) : S 41 – 4 .
- 5- Gaytan , A . G . , *et al.* 2006 . Non Steroidal Anti – Inflammatory Drugs (NSAIDs) and ovulation : Lesson from morphology . Hislopathologically .
- 6- Gilman , A . G . , L . S. Groodman and A. Gilman , 1990 . The Phannacological Basic of therapeutics . 6<sup>th</sup> Edh . Macmillian Pub . Co . Inc . New York .
- 7- Gociong Z (2003) : The real dimension of analgesic activity of aspirin . Thrombosis Research 110 (5 – 6) 361 – 4 .
- 8- Kathleen Parfitt , Matindale the complete drug reference , 1999 ; P : 16 – 19 .
- 9- Klaassen , C . D . ; 2001 . Casarett and Doulls . Toxicology . The Basic Science of poison . 6<sup>th</sup> Edh , the McGraw – Hill Companies . Inc . New York .

- 10- Kuo – HC , HSU – CC , Wang – ST , Hung – KE , Aspirin improves uterine blood flow in the peri – implantation period , J, . Formos . Med . Assoc , 1997 ; 96 (4) : 253 – 257 .
- 11- Rubinstein M , Marazzi A , Polak de Fried E Low – dose aspirin treatment improve ovarian responsiveness m uterine and ovarian blood flow velocity , Fertil Steril , 1999 ; 71 (5) : 825 – 829 .
- 12- Skomsvoll , J . F . , R . E . K . H . Seavn , S. K . Asumuned , V . D . V . R . Tarjei and O . Monika , 2005 . Reversible infertility form non – steroidal anti – inflammatory drugs . 125 : 1476 – 1478 .
- 13- Wada I , Hsu CC , Williams G , Manamee MC , Brindsen PR . The benefits of low dose aspirin therapy in women with impaired uterine perfusion during assisted conception . Hum Report 1994 ; 9 (10) : 1954 – 1959 .
- 14- Weksler BB , Pett SB , Alonso D , Richter , Rc , Stelzer P , Subramanian V , Tack – Goldman K , Gay WA . Differential inhibition by aspirin of vascular and platelet prostaglandin synthesis in atherosclerotic patients . N Engl J Med , 1983 .

## الخلاصة :

استخدمت في هذه الدراسة ( 21 ) أنثى جرذان بيضاء ،تتراوح أوزانها ما بين (150 gm) (170 gm) قسمت إلى ثلاثة مجاميع عشوائية، الأولى اعتمدت كسيطرة والمجموعة الثانية عوملت بمادة الأسبرين بجرعة (10) مليغرام لكل كيلو غرام من وزن الجسم عوملت لمدة (15) يوم ، والمجموعة الثالثة عوملت بالأسبرين لمدة ثلاثين يوم .

أستخدم الأسبرين عن طريق التجريع الفموي ، أما المجموعة التي اعتمدت كسيطرة جرعت بمحلول مقطر ذو تركيز (0.05) ، أوضحت الدراسة تأثير عقار الأسبرين ذو جرعة واطئة وتأثيراته المتباينة على أنسجة المبيض والأنبوب الرحمي والرحم للحيوانات المعاملة لفترتين مختلفتين حيث لوحظ التغيرات النسجية بشكل أوضح في المجموعة المعاملة لمدة 30 يوم، أظهرت حدوث احتقان مع نزف في بعض مناطق الرحم خصوصا أما في البطانة الرحمية .

لم تلاحظ تغيرات واضحة في الخلايا البطانية الداخلية للرحم أو الغدد الرحمية أما الطبقة العضلية امتازت بانخفاض في سمكها وضمور لبعض الأجزاء من عضل الرحم ، أما مقاطع المبيض أوضحت حدوث احتقان مع وجود تكيسات مؤدية ظهور الأجسام الصفراء مع ازدياد في إعداد الجريبات النامية مع انخفاض إعداد الجريبات الناضجة .

# تأثيرات التركيبة النسيجية للأسبرين على أعضاء الجهاز التناسلي الأنثوي للجرذان المعاملة

د. نهى شاكر علي

جامعة القادسية/كلية طب الأسنان