Histopathological study for changes that caused by the administration chloramphenicol on the male local rabbits

Emad.K.Abbas*and AbedAljabar.R.Kueat**

الخلاصة

أجري هذا البحث لدراسة تأثير عقار الكلورامفينكول على نسيج الكبد والكلى في ذكور الأرانب المحلية وحيث استخدمت ثمان أرانب (4 لكل مجموعة) اعتبرت المجموعة الأولى كمجوعة سيطرة وحيث جرعت بالمحلول الفسيولوجي (0.9%) أما المجموعة الثانية فقد جرعت بالعقار بواقع (ملغم 250) ولمدة ستة عشر يوما. قتلت بعدها الحيوانات وأخذت منها الأعضاء المذكورة وتمثلت العلامات المرضية في نسيج الكبد بحصول حالة النزف الدموي والارتشاح الخلوي التنخر فضلا عن حصول حالة تفجي الخلايا الكبدية . أما نسيج الكلى فقد أظهر هو الأخر بعضا من التغيرات المرضية والتي تمثلت بحصول حالة احتقان الأوعية الدموية مع حصول حالة التنخر.

Abstract

This study shows the effect of chloramphicol drug on liver and kidney tissues in male rabbits. We used eight animals for each group . The first group used as a control by using physiological saline(0.9%) concentration . The second group were taken the drug(250 mg) for sixteen days.

Biopsy were taken from the animals to examine their tissues histopathologically. Results were seen in liver tissues in the form of bleeding . cellular infiltration and necrosis .kidney tissues also reveal pathological changes like congestion and necrosis.

Introduction

Chloramphenicol is considered as wide spectrum antibiotics that discovered 1947, Through culturing of steptomyces venzuela, The chemical structure of the antibiotic is simple, it is white crystal powder has little ability to dissolve in water, it dissolved in organic solutions and resistant to boiling(1).

*Dep.Anatomy&histology,collage of medicen,university of Basra

**Dep.Anatomy ,collage of ventrial,university of Basra.

Chloramphenicol is considered as wide spectrum antibiotic and it is clearly noticed results of its use by the fixation different types of bacteria, it showed success in cases of typhoid fever and paratyphoid fever ,it is active fixative in protein synthesis and has some effect on functions of metabolism ,it works on bacterial ribosome from type and clearly has a role with the bounding amino acids to peptide than developed earlier by stop the enzymatic action of piptidyle transferase(2).

This antibiotic absorbed completely from small intestine specially in ileum region after its oral administration ,it reached highest level in blood within 2 hours ,then decreased to the half the level after 6 hours , then disappear from blood after 12-18 hours, it joined protein and blood plasma in a ratio of 60-70 % ,it is excreted in a ratio of 10 % from the administered dose by the glomerular filtration and about 90 % by the tubular secretion , few quantities of this antibiotic is excreted by gall bladder and feces (3).

Concentration of this antibiotic in liver , spleen , lung , kidney eyes and muscles, it can pass the blood-brain barrier and placental barrier, it detoxified by liver to glucorottids , then excreted with urine ,toxicity to bone marrow , inflammation of nerves and anemia. Are an examples for its side effect also it effect on the numbers and types of microorganism in respiratory and urogenital tract (4).

High dose of oral administration caused decrease prothrombin level because of its effect on normal flora and there are responsible for synthesis of vitamin(k)(5).

Other studies that have interest in the effect of this antibiotic , the al-Dahan study (6) that showed its effect on the absorptive characterization for many therapeutic compounds in digestive tract in laboratory animals , also another study done Ali(7) that results in the biochemical effect in liver , Researcher Mounsa (8) showed the effect of chloramphenicol on the rhythmic movement of intestine in mice.

Materials and Methods

Local rabbits were used , their weights range between(500-1kg) .Animals were administered the drug chloramphinicol (Trace – medical –Germany) in 250 mg dose by using stomach tube for 16 days, The rabbits were killed and liver kidney biopsy were taken . The samples were examined histopathologically as described by (9) . The control group were administered by normal physiological saline (0.9%).

Results

Histological specimens of liver reveal some pathological changes in the form of bleeding(Fig.1) , cellular infiltration (Fig.2) and necrosis ,in addition to vacuolation of the hepatocytes (Fig.3) . Specimens that are taken for the control group reveal the hepatic lobules and location of central vein in addition to the radial arrangement of hepatic plates separated by blood sinusoids (Fig.4). Kidney tissue also reveal some changes as vascular congestion(Fig.5) and necrosis (Fig.6). The normal histological structure of kidney tissue from the control group show the arrangement of Bowman capsule, glomerulis and renal tubules (Fig.7).

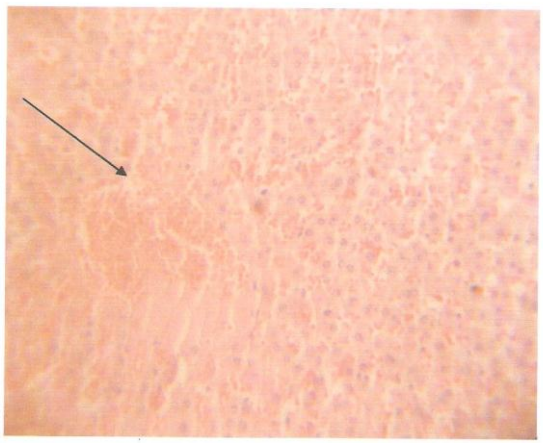

Fig.1: section of the liver tissue in animals treated with chloramphenicol show induce bleeding . H&E (40x).

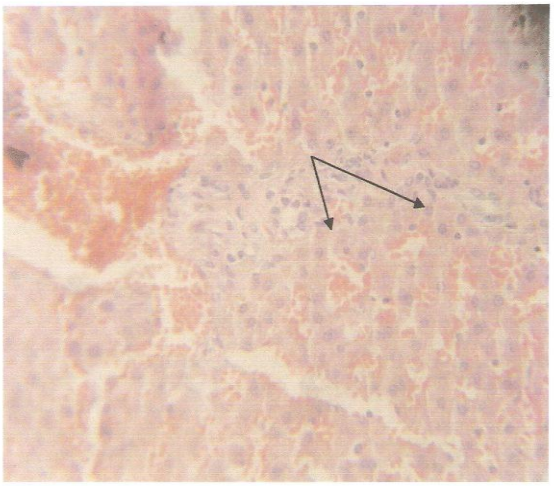

Fig.2:section of the liver tissue in animals treated with chloramphenicol show induce the infiltration .H&E (40x).

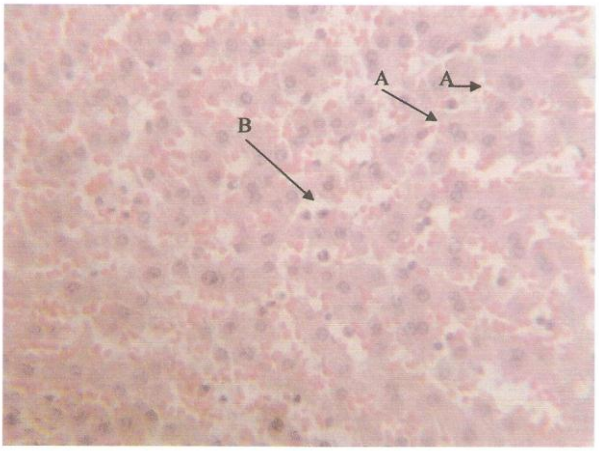

Fig.3: section of liver tissue in animals treated with chloramphenicol show induce the vacuolation of the hepatocytes(A),the necrosis (B). H&E (40x).

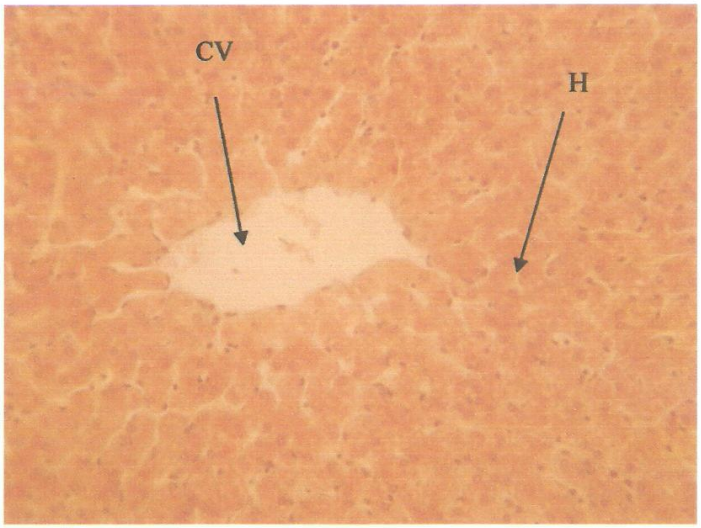

Fig.4: section of the liver tissue in control animals show the central vein (CV),the hepatocytes (H). H&E (40x).

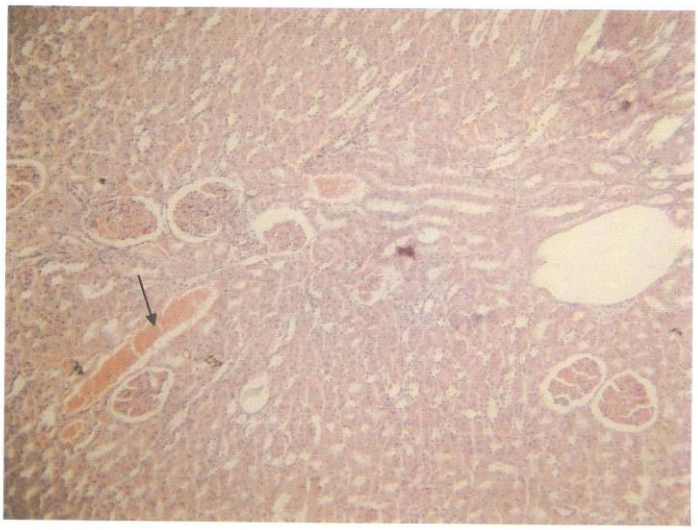

Fig.5: section of kidney tissue in animals treated with chloramphenicol show induce the vascular congestion .H&E (40x).

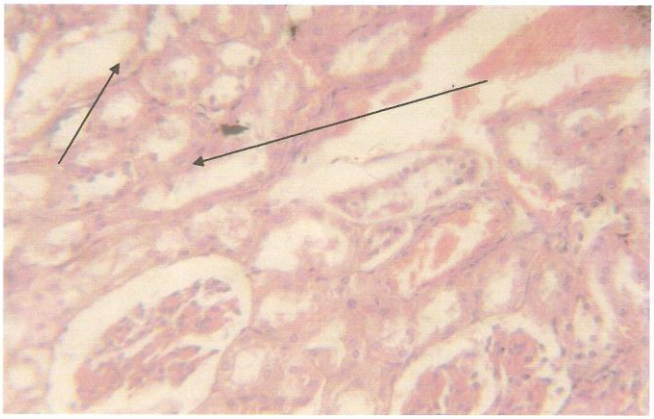

Fig.6: section of kidney tissue in administration animals by chloramphenicol show induce the necrosis . H&E(40x).

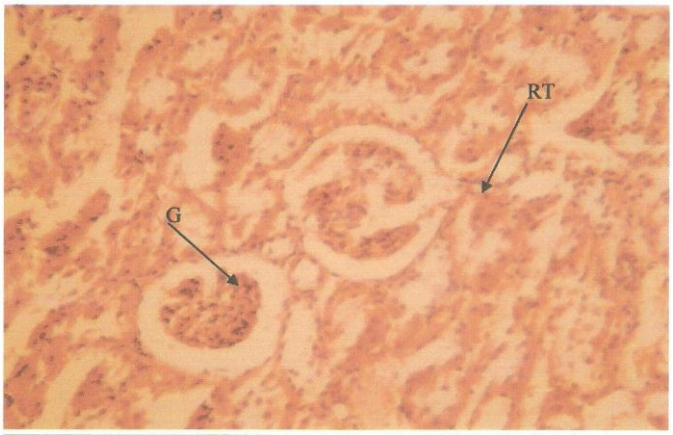

Fig.7: section of kidney tissue of control animals show Glomeruli (G), Renal Tubules (RT)
H&E (40x).

Discussion

Liver is considered as an important organs that has a role in drug detoxification and degradation ,The results of the study present a histopathological findings in liver for the administration group of rabbits with the drug, these finding are bleeding , cellular infiltration and necrosis , in addition to vacuolation of some of the hepatocytes, These results are comport with the results done by other investigators (10) that done on male rats treated with

(tetracycline) , their results revealed necrosis , vacuolation ,cellular infiltration for some of the hepatocytes. Another study Doundey (11) on white male mice treated with (oxytetracycline)with a dose of (100mg/kg) the study revealed the mentioned dose enough to cause damage in liver tissue and show sever necrosis.

Other researchers Becker & Metz (12) explain the effect of (Thiammphenicol) on normal tissue of liver from ginea pigs ,They found histopathological findings range from hepatocytic necrosis to lymphocytic infiltration ,in addition to vascular congestion, they connect this finding to the toxic effect of the drug to disturbance of cellular respiration. Most drugs have the ability to induce the enzymatic activity of Gamm-glutamy transpeptidase and the importance of its stimulation for production of inflammatory cells as a response for inflammation which starts usually in a simple mode till it reach the acute case ,In a cute case of inflammation cells increase ,as a result of the stimulating factors for production of these cells(13).other researchers Anderson (14) proposed that inflammation as general lead to vascular congestion in the inflammed region and effecting on the normal demand for O2 and nutrients , therefore results in beginning of necrosis of hepatocytes in regions surrounding the inflammed areas, till it reached the complete necrosis . Also Hapke (15) proposed an effect on ATPase in liver mice treated with (CHP) that cause disburance in ionic exchange (Na&K).

Kidney tissues spicemen revealed some histopathological changes in the form vascular congestion with renal necrosis , Other study done by Symmers (16) they proposed the vascular congestion in kidney which result as the beginning of inflammatory response from the body ,it cause dilatation in arteries then release in blood pressure that cause passage of blood from arteries to veins and lead to its congestion.

References

1-Smadel,J,Lon.P.(1997).Chloromyctin in the treatment of patient with typhic fever .proc.Soc.Exp.Bio.,68:12.
2-Shaw,W.and Brods. R. (1985).Characterization of (CHP) acetyl transferase from (CHP) resistance staphylocus aureus. J.Bacten .,45:28.
3-Goodman,S.and Gilman,A.(1995).The pharmacological bases of theropeutices.5th .Ed., Macmilan publishing New York.
4-Manyan, D.(1990). CHP .Induced erthroid suppersion and bone marrow Ferro chelatase activity in dog . J . Lab.clin . Med.,70;140.
5-Gludon,B.(1980). Fatal-Plastic anemia associated with CHP and chloro myatin therapy blood, 20:215.
6-Buthina,A.Al-Dahan(1990) .Effect of (CHP) on the absorption of some therapeutic compound from (GIT) in examination animals.(Msc.Thesis,Uni.of Baghded).
7-Ammar,Ali.(1982). Effect of (CHP) on rat liver (Biochemical changes).(Msc.Thesis,Uni.of Mousl).
8-Mousna,J.(1999).Mechanism of CHP –induced-modulation of rat ileal motility . Jap.J.Med.,48:89.
9-Luna,L.G.(1989). Manual of histological staining Methods of the armed forces institutes of puth.McGraw-Hilll,inc-USA,pp:32.
10-Doundey,C.(1990).Tetracycline promoted increase in resistance to damage in mice.
11-Dalakere,M.(1979).Extraction of oxytetrucyline in the milk after parental application .Nature,148:535.
12-Becker,D,Metz,J.(1998). Histological and ultra structural studies of guinua pig exposed to thiamphenical .post,Med,J.,50:35.
13-Ambrose,P.(1984).Inhiption of metabolic operation in vitro and enhancement of enzyme in dogs liver.Arch,toxicol.,60:200.
14-Anderson,J.R.(1980).Muris textbook of pathology.printed by Buiter and Jauner,LTD.,Lond,pp:1074.
15-Hapke,H.(1989). Effect of chloromycetine on drug degrading enzyme system. Zentrable.Veterinae.24:701.
16-Symmers.W.(1980).Fundamental of clinicalendocrinology. 2ed.,Lon.PP:499.