International Journal of Current Research in Multidisciplinary (IJCRM) *ISSN: 2456-0979*
Vol. 3, No. 11, (November'18), pp. 28-32

The effect of silymarine extracted from *Silibum marianum* seeds on histopathological changes in male rabbits liver and kidney induced by nickel chloride toxicity

Wasfi Dh. Abid –Ali
College of Nursing, , University of Basrah, Basrah, Basrah, Iraq.

ABSTRACT: *This study aimed to evaluate the protective effects of ethanolic extract from Silybum marianum seeds(sylimarine) from north of Iraq against NiCl2 toxicity induced histopathological changes in liver and kidney of male rabbits .thirty adult male rabbits were used as experimental animals to investigated the ameliorative effects of sylimarine against toxicity of $NiCl_2$ on liver and kidney .*

The results elevated that rabbits received nickel chloride(1 mg /100gm B.W) orally for 35 day showed histopathological changes on tissue cells of liver and Kidney while silymarine extract (0.1mg/100gm B.W) ameliorated tissue damage.
KEYWORDS; Silymarin, Nickel, Rabbits ,Liver and kidney

INTRODUCTION

Milk thistle plant is native to the Mediterranean as well as grows throughout Europe , North America ,d India, China, South America, Africa and Australia **(Dixit, *et al.*, 2007)** , it used in the treatment of liver and gallbladder disorders, including hepatitis, cirrhosis, jaundice, and as protective against Amanita phalloides mushroom and other toxin poisons. **(Pradhan and Girish, 2006). Shalan *et al.*,(2006)** used sylimarine in rats against lead toxicity used 1 mg/100gm of body weight. In other study they used silymarine against Alchhol toxicity in rabbits.**(Shalan, *et al.*, 2007)** . **Parekh *et al.*,(2006)** studied the toxic effects of oral exposure to nickel and Indicated that nickel chloride induced nephrotoxicity in mice and increased peri-glomerular space**.** **Amel and Najah (2004)** showed that nickel chloride induced oxidative damage indicated by the increased activities of serum hepatic enzyme**.** **Lakshmi, *et al.*,(2007)** pointed that nickel, a major environmental pollutant, is a known potent nephrotoxic agent , and they reported the chemopreventive effect of luteolin on nickel chloride ($NiCl_2$)-induced renal damage. **Ounassa (2013**) found that the exposure to nickel chloride ($NiCl_2$) caused hematotoxicity ,hepatotoxicity, oxidative stress, toxicity,and cell proliferation response in male Wistar rats.

MATERIAL AND METHODS

Thirty adult male rabbits subdivided into three equal group of 10 animals each , first group served as a control and daily received orally 1 ml normal saline (NaCl 0.9%), The second group received only 1 mg /100gm B.W $NiCl_2$, the third group received the same dose of $NiCl_2$ fallowed by 0.1mg/100gm B.W ethanolic extract from *Silibum marianum* seeds (Iraq-Mosel) (Abid -Ali *et al*. 2014) by method of (Wallace *et al*. 2003).

The experiments extend for 35 days, at the end of the experimental period all male of the experiment were sacrificed and live rand kidney were isolated surgically, served in containers filled with 10% formalin. Histopatological technique (leslie and James 2007**)** for microscopic examination .

RUSELTS AND DISCUSSION

Oral nickel chloride (1mg/100mg B.W) dosing(group 1) caused histopathological changes in male rabbits liver after 35 days ,Cross section of liver of Nickel chloride treated rabbit showed congested

central vein , flattening and vacillation of hepatocytes ,enlarged pyknotic nuclei of hepatocytes,with disarrangement of hepatic architecture(Figure 2). compared with control group(Figure 1).

After 35 days of nickel chloride drenching lead to congested central vein , flattening and vacullation of hepatocytes ,enlarged pyknotic nuclei of hepatocytes,with disarrangement of hepatic architecture(Figure 2).

Abou Hadeed, *et al* . *(*2008) found that the liver showed congestion of central veins and sinusoids some hepatocytes suffered from vacuolar degeneration , these findings are inagreement with the finding of the present styudy **. El-Saieed and Mekawy (2001)** showed congestion of central veins and sinusoids , some hepatocytes suffered from vacuolation these results are also obtained by **Ptashynski, *et al.* (2002)** and **(Sobecka , 2001).**

Djemli and Kechrid (2013) Found that liver of nickel treated group had weak pathological alteration such as the presence of cellular debris within a central vein and cytological vacuolization. Other histological studies on rat documented Ni-induced changes characterized by dilated sinusoids, vacuolization and the appearance of hepatic cells with distorted nuclei **(Ben Amara *et al.*, 2010; Rabbani-Chadegani *et al.*, 2001; Djemli *et al.*, 2012).**While $NiCl_2$ (1mg/100mg B.W) plus silymarin extract (0.1mg/100gram B.W) treated rabbit(group 3) their livers showed normal central vein , normal sinusoids less vacuolated hepatocytes and better hepatic architecture(figure 3).

Shallan, *et al.* (2007) showed the ameliorative effects of silymarin in rabbits against alcohol toxicity induced liver damage in rabbits and against lead toxicity in rats **(Sallan, *et al.*,2006).** While $NiCl_2$ (1mg/100mg B.W) plus silymarin extract (0.1mg/100gram B.W) treated rabbit(group 3) the liver showed normal central vein , normal sinusoids less vacuolated hepatocytes and better hepatic architecture(figure 3).

Male rabbits of group (1) that received 1ml normal saline showed normal showing normal renal structure, normal size of glomeruli and normal lining cuboidal tissue of renal tubules (figure 4).
Male rabbits that received (1mg/100mg B.W)nickel chloride orally for 35 days(group 2) showed destruction of glomeruli and misshaped lining of renal tubules(figure5).Group(3) where the male rabbits received nickel chloride1mg/100gram B.W plus silymarin extract(0.1mg/100gram B.W for the same period showed better glomeruli, normal size of glomeruli but still there are misshape renal tubules(figure 6)

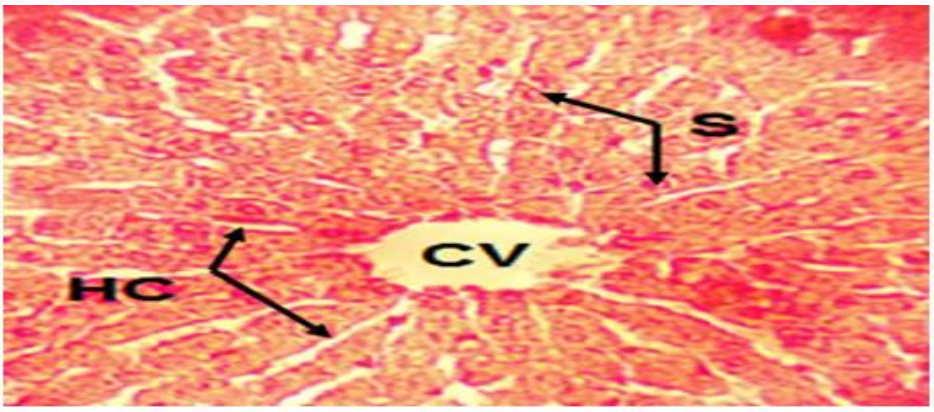
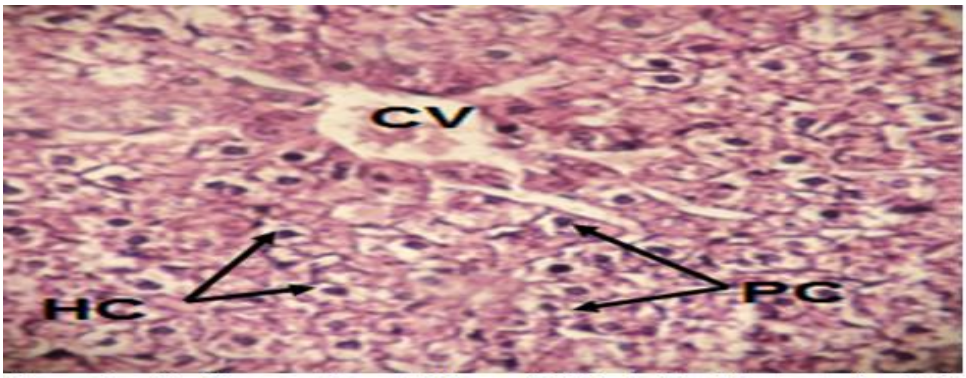
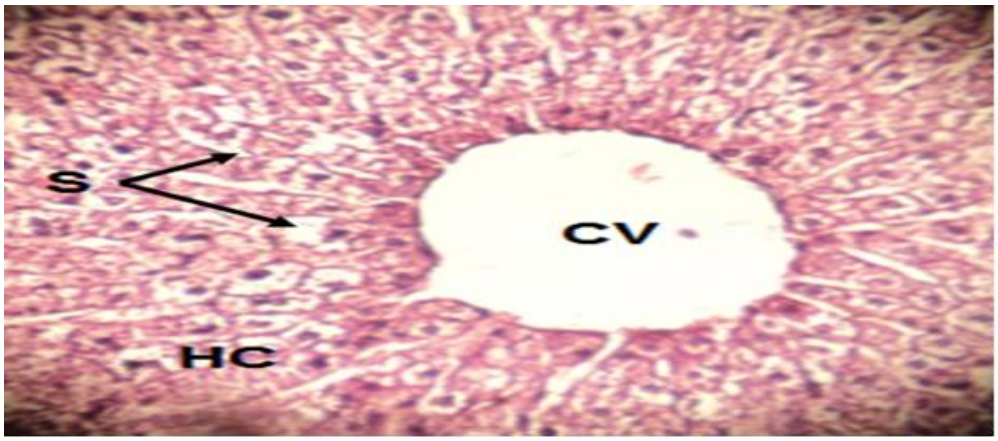


Figure (1) Cross section of liver of control male rabbit showing normal central vein (CV) normal sinusoids (s) and normal hepatocytes(HC)(H&E)stain .400 X



Figure(2) Cross section of liver of Nickel chloride treated rabbit showing congested central vein (CV), flattening and vacillation of hepatocytes (HC), enlarged pyknotic nuclei of hepatocytes(PC) with disarrangement of hepatic architecture (H&E) stain.400 X



Figure(3) Cross section of liver of Nickel chloride plus silymarin extract treated rabbit showing normal central vein (CV), normal sinusoids (S) less vacuolated hepatocytes (HC) better hepatic architecture (H&E)stain .400 X

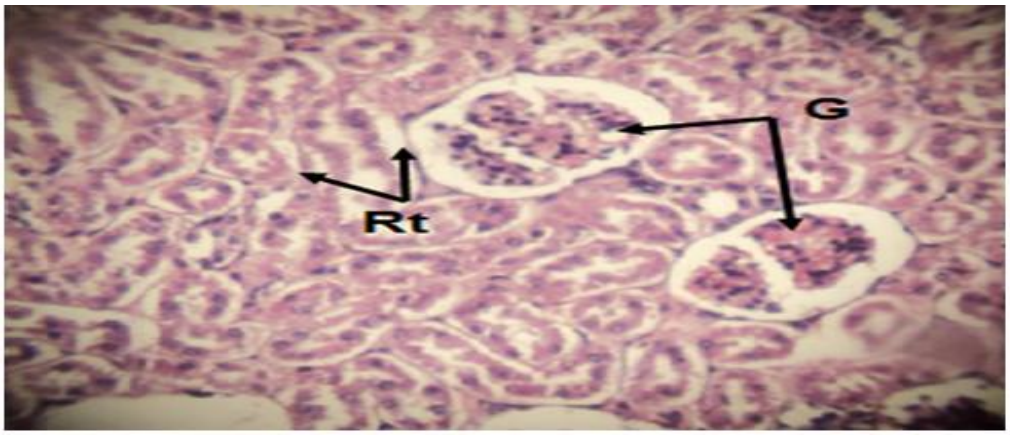


Figure (4) Cross section of Kidney of control rabbit showing normal renal structure; normal size of glomoruli(G); normal lining cuboidal tissue of renal tubules (RT).(H&E) stain .400X

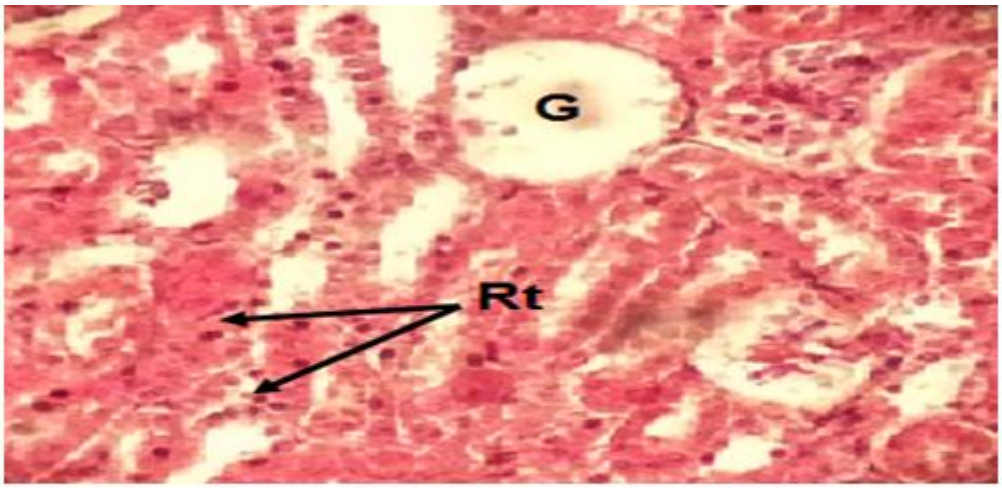


Figure (5) Cross section of Kidney of Nickel chloride treated rabbit showing destruction of glomeruli(G); misshaped lining of renal tubules(RT);.(H&E) stain .400X

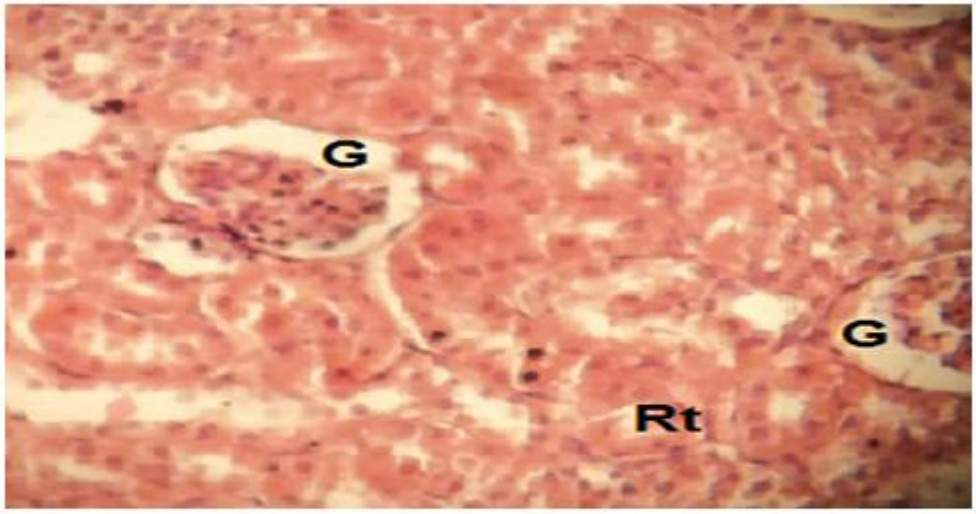


Figure (6) Cross section of Kidney of Nickel chloride plus silymarin extract treated rabbit showing better glomeruli(G); normal size of glomeruli (G)but still there are misshape renal tubules(RT) .H&E) stain .400X

CONCLUSION

Histopathological changes caused by nickel chloride induce damage of tissue cells of liver, kidney while silymarin extract ameliorated tissue damage

REFERENCES

[1] **Abou Hadeed,** A.; Ibrahim,H.; El-Sharkawy,I.; SalehSakr , F. and Abd El-Hamed S.(2008): Experimental studies on nickel toxicity in Nile .Tilapia health 8th international symposium on Tilapia in aquaculture 1385.

[2] **Amel**, A. and Najah, M. (2004): Effect of nickel chloride on the lung of male albino rats with evaluation of the possible protective role of vitamin A, light and scanning microscopic study.The Egyptian J. of histology- Vol. 27 - NO.2.

[3] **Ben** Amara , I.; Soudani, N.; Troudi, A.; Bouaziz, H.; Boudawara, T.and Zeghal,N.(2010): Antioxidant effect of vitamin E and selenium on hepatotoxicity induced by dimethoatein female adult rats. Ecotoxicol. Environ. Saf. 74(4):811-819.

[4] **Dixit,N**.;Baboota,S.;Kohli,K.;Ahmed, S., and Javed,A.(2007):Silymarin: A review of pharmacological aspects an bioavailability enhancement approaches. Indian J Pharmacol, 39(4),172-179.

[5] **Djemli**,S. and Kechrid ,Z.(2013):Preventive effect of zinc on nickel-induced oxidative liver injury in rats. African Journal of BiotechnologyVol. 12(51), pp. 7112-7119

[6] **El-Saieed**, M. and Mekawy,M. (2001): Nickel Toxicity in Oreochromis niloticus fish J. Egypt Soc. Toxicol. 24:47-54.

[7] **Lakshmi,** P.;Tajdar, P.; Husain, K.;Tamanna, J. and Sarwat Sultana (2007):Effect of Luteolin on Nickel Chloride–Induced Renal Hyperproliferation and Biotransformation Parameters in Wistar Rats.Pharmaceutical Biology,; 45:116-123 .

[8] **Leslie,** P. and James, L. (2007): Colored text book of histology .by Saunders,animprint of Elsevier Inc. PP: 1-2.

[9] **Ounassa,** A(2011):The toxic effects of nickel chloride on liver, erythropoiesis, and development in Wistar albino preimplanted rats can be reversed with selenium pretreatmen .Environmental Toxicology Vol. 28, 5, pp: 290–298 .

[10] **Parekh,** S.; Chawla, S. and Rao,M. (2006): Beneficial effects of vitamin in mitigating Chromium – Nickel induce nephrotoxicity in mice**..** Journal of Cell and Tissue Research Vol. 6 (2) 797-802 .

[11] **Pradhan,** S. and Girish, C. (2006) **:** Hepatoprotective herbal drug, silymarinfrom experimental pharmacology to clinical medicine. Indian J. Med. Res., 124:491-504.

[12] **Ptashynski**, M. and Klaverkamp.F. (2002): Accumulation and distribution of dietary nickel in lake white fish (Coregonus clupeaformis). Aquatic toxicology 58. 249-264.

[13] **Rabbani-**Chadegani, A.; Fani, N.; Abdossamadi, S. and Nosrat Shahmir, N.(2001): Toxic effects of lead and nickel nitrate on rat liver chromatin component. Biochem. Mol. Toxicol 25:127-134.

[14] **Shalan,** M.; Abd Ali ,W. Dh.and , Shalan ,A.(2007): The protective affecacy of Vitamins(C and E), selenium and silymarin supplementation against alcohol.J. World Rabbit Sci. 2007, 15: 103 – 110.

[15] **Shalan**, M.;Abd-Ali,W and Shalan,A.(2006):The protective role of vitamins(C&E), selenium, Silymarin supplement aginst alcohol intoxication. J. of world rabbit science,15:103-110.

[16] **Sobecka**, E. (2001): Changes in the iron level in the organs and tissues of wels cat fish, silurus Glanis L. Caused by nickel. Acta Ichthyol . Piscat., 31 (2): 127-143.

[17] **Wallace**,S.; Carrier, D. and Clausen, E.(2003):Extraction of nutraceuticals from milk thistle: part II. Extraction with organic solvents Appl Biochem Biotechnol. pp:891-903.