Histopathological study of the toxic doses of Clove Oil*Syzygiumaromaticum" on Ovaries of female rabbits"

Abdulamir Ali Alzahid(1); JawadKhadiumFaris; OdaiSoliamanKodiari
Al Qusim Green University-College of veterinary medicine

Abstract: A twenty four local rabbits average (1450-1550) gram were divided into three groups, each group was eight rabbits. Group one (G1) was given a daily dose (0.25) gm of Clove oil "Emad vegetable oil company-Mosul-Iraq concentration 100%" for 30 days. Group two (G2) was given a daily dose (0.5) gm. of Natural Clove Oil "Emad vegetable oil company-Mosul-Iraq concentration 100%" for 30 days. While the third group (G3) was the control group given 1cc Tap water. The study revealed a moderate pathological changes. Varies from congestion to inflammatory cells and necrosis in the medullary region as shown in the result.

Keyword: histopathology–Clove oil- Ovaries– female Rabbits.

I. Introduction

Clove oil is an essential oil from the dried flower buds, leaves and stems of the tree "Syzygiumaromaticum" (Schmid R, 1972). It has many uses in human and veterinary field, it is used in fragrance formulations, flavors in the perfumery and food for its spicy aroma

(Murray, 2000). cosmetics,(www.cosmeticsdatabase.com) and personal care products, antibacterial, antifungal (Kalenga&Municka 2003; Chami et al., 2005), antiviral, antitumor, antioxidant and cytotoxic properties (Baratta et al., 1998; Dorman et al., 2000; Gayoso et al., 2005; Prashar et al., 2006; Politeo et al., 2010). insecticidal(Huang et al., 2002), local anesthetic and dental care properties(Cai L, 1996; Chaieb K.et al,2007). Acute and chronic clove oil toxicity to mammals Acuteley toxic. However, oral LD50 values in all species tested were greater than 1,190 mg/kg. In sub chronic toxicity tests, no adverse effects were observed in studies with laboratory animals up to doses of 900 mg/kg-day. It was observed that liver damage caused by a high doses of clove oil (Susan K., et al., 2010). There is some research talks its carcinogenicity(Zheng GQ., et al, 1992), but not sufficient for a listing as a carcinogen. Acute and chronic clove oil toxicity to mammals is low(Chaieb K, et al, 2007). There is no studies available concerning toxicity of clove oil to the reproductive system(Susan K., et al, 2010).

II. Material & Method

Three groups of local female rabbits, each group was (8) Rabbits in number. G1 group was administered daily oral dose of clove oil 0.25 gm "Clove oil" (Al Emad oil company-Mosul-Iraq, concentration 100%) for 30 days. The second group G2 were given daily oral dose 0.5gm" of Clove oil" the same source" for 30 days. While the 3rd group G3 left as a control and was given 1cc tap water. All groups were fed on hay plus pellets of broiler feed stuffs. Water supplied ad libitum. At day(3o) all sacrificed female rabbits were necropsied. Collecting the specimens of ovaries and fixed with neutral buffer of formalin 10% paraffin section(8-9 microns) and stained with Harris eosinhamatoxyline stain and then microscopically examined.

III. Result & Discussion

Clove oil and "eugenol" as an active ingredient were found to be spermicidal in an in vitro study of six male partners of infertile couples"(Buch JG., et al,1988). still there is no resent study discuss the effect of clove oil on the female reproductive tract as a whole (Susan K., et al,2010).

As shown in the figures, In comparison of the lesions seen group 3 (G3) the normal histological structure. In group 1(G1) which was given oral dose of (0.25) ml clove oil, the ovarian tissue shows retraction of the Oocytes in its distances, with the mononuclear cell infiltration and vacuolation of the cytoplasm. Our result is agreed with (HoYC., et al.,2006; Prashar A., et al,2006) as shown in fig 3 with pyknotic of nucleus of some follicular cells. In fig4 and fig 5 the (G1) show sever dilation and congestion of the blood vessels with vacuolation of the cytoplasm.

While in group (G2), fig 6 shows areas of necrosis and hemorrhages of the ovarian stroma, our result is agreed with (Hartialaet al., 1966). While in fig 7 shows a large ovarian cyst lined by granulosal cells. In fig 8 there is a necrosis in the medullary zone. In fig. 9 a sever suppression of ovulation characterized by few and non-developed ovarian follicles. Fig. 10-11 showed increase number of atretic follicles and failure of ovulation with a severe destruction of ovarian stroma, this agreed with (Buch JG., et al.,1988) when we consider the effect of
toxicity of Clover oil and its effect on the reproductive tract is the same whether in male or female gonads. Fig. 12 showed a large multiple follicular cyst.

(Figure 1): Histopathological section for control group of rabbitovary showing the normalhistologicalstricture. (H&E400X)

(Figure 2): Histopathological section of ovaryofrabbittreated with clove for 30dayfor G1ofshewingretractionoftheooocyte anditsdistance zone ( ) withmononuclear cellinfiltration ( ). (H&E400X)

(Figure 3): Histopathologicalsection ofovaryof rabbittreated withclove for 30dayfor G1ofshewingvacuolation of cytoplasm( ) with pynotic ofnucleus ofsome follicular cells ( ) (H&E400X).
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(Figure 4): Histopathological section of ovary of rabbit treated with clove for 30 days for G1 showing dilatation and congestion of blood vessels (→) (H&E 400X).

(Figure 5): Histopathological section of ovary of rabbit treated with clove for 30 days for G2 showing severe dilatation and congestion of blood vessels (→) (H&E 400X).

(Figure 6): Histopathological section of ovary of rabbit treated with clove for 30 days for G2 showing necrosis (→) hemorrhage in ovarian stroma (→) (H&E 400X).
(Figure 7): Histopathological section of ovary of rabbit treated with clove for 30 days showing large ovarian cyst lined by granulosa cell (→) (H&E 100X).

(Figure 8): Histopathological section of ovary of rabbit treated with clove for 30 days showing necrosis in medullary region (→) (H&E 400X).

(Figure 9): Histopathological section of ovary of rabbit treated with clove for 30 days showing severe suppression in ovulation characterized by few and non-developed ovarian follicles (→) (H&E 400X).
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(Figure 10): Histopathological section of ovary of rabbit treated with clove for 30 days for G2 showing increase in number of atretic follicles (→) (H&E 400X).

(Figure 11): Histopathological section of ovary of rabbit treated with clove for 30 days for G1 showing failure of ovulation (→) and severe destruction of the ovarian stroma (→) (H&E 400X).

(Figure 12): Histopathological section of ovary of rabbit treated with clove for 30 days for G2 showing multiple larger rounded follicular cysts (→) (H&E 100X).
IV. Conclusion

The study showed that the toxic doses of clove will lead to a serious cellular damage to ovarian tissue. the higher and long dose of clove oil the more lesions were found in the ovarian tissues. More studies are needed on reproductive tracts supported by biochemical and sex hormones assay.

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References

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