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EFFECTS OF OESTRADIOL ADMINISTRATION ON HEPATORENAL FUNCTIONS IN MALE RATS

BY

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SUMMARY

25 mature male Albino rats were used in the present study to clarify the effects of oestradiol on hepatorenal function. They were divided into two groups, control group and treated group. The results showed that there was increase in serum level of alkaline phosphatase, ALT, AST, bilirubin, urea, creatinine, triglycerides and cholesterol following oestradiol treatment.

So, it is concluded that administration of oestradiol at high dose rates to mature male rats has a serious harmful effects on hepatorenal functions.

INTRODUCTION

Estrogens are mainly synthetized by the ovaries and play an indispansable rols for regulation in mammls including rats **(Feder et al., 1971 and Turgeon, 1979)**. Oestradiol is also present in low concentrations in serum of normal males: approximately one third is secreted by testis while the remendar content is derived from zona reticularis of the adrenal cortex as well as during metabolism of testosterone in the liver and adepose tissue **(McDonald, 1980 and Marshall, 1988)**. Several studies were previously carried out to explore the effects of oestrogens on serum levels of liver enzymes **(Brahult and Westgren, 1966, Benjamin, 1979 and Zeinab et al., 1984)**, urea **(Zeinab et al., 1984)**, Proteins **(Vantienhoven, 1986)**, electrolytes **(Maxwell and Kleeman, 1980)**, trace elements **(Varely et al., 1980)** and fat metabolism **(Varely et al., 1980)**. The majorty of these studies were performed in female animals.

The aviable literature concerning the effects of osstradiol administration on hepatoronal functions in male animals are scarce. Therefore, the present work was planned to study this topic in male rats.

MATERIAL AND METHODS

25 mature male Albino rats of an average weight 150 gm, received from Zagazig University laboratories were used in the present study. They were divided into two groups, the first (10 rats) was injected I/m with 0.5ml olive oil (centrol group), the second group (15 rats) was injected i/m with 0.5 ml olive containing 10 ug osstradiol benzoated "E" (Folo, Misr Co.). For both groups, injections was repeated every three days for one month. Three days after the last injection, individual blood samples were obtained through orbital sinus puncture and sera were separated and presenved at -20°C until biochemical analysis.

Liver and kidney functions were evaluted biochemically by determiantion of serum alanine aminotrransferase (ALT) and serum aspartate aminotransferase (AST) **(Reitman and Frankel, 1957)**, Alkaline Phosphatase **(Kilchling and Freiburg, 1951)**, Bilirubin (Recommendation on a uniform bilirubin standard, 1962), Cholosterol **(Watson, 1960)**, Triglycorides **(Fossati and Prencipe, 1982)**, total lipid (Schmit, 1964) total protein and albumin (Reinhold, 1953), urea **(Mackay and Mackay, 1927)** as well as creatinine **(Husdan and Rapoport, 1968)**. Data were statistically analysed according to Snodocor

Table(1) : The effects of oestradiol administration on hepatorenal functions in male rats.

Item	Control Group	Treated Group
• Alkaline phosphatase (King and King u/dl	30.2 ± 4.02	43.17 ± 3.84*
• ALT u/ml	38.78 ± 2.33	60.92 ± 7.61**
• AST u/ml	120.75 ± 6.82	190.76 ± 9.43**
• Bilirubin mg/dl	0.65 ± 0.02	2.31 ± 0.23**
• Urea m mol/L	60.44 ± 2.59	83.65 ± 3.87**
• Creatinine mg/dl	2.55 ± 0.16	3.52 ± 0.06**
• Triglycerides mg/dl	125.73 ± 2.60	148.81 ± 1.01**
• Cholesterol mg/dl	32.72 ± 1.86	45.80 ± 1.67**
• Total lipids g/L	6.53 ± 0.11	8.69 ± 0.57
• Total protein g/dl	5.94 ± 0.43	6.80 ± 0.34
• Albumin g/dl	2.89 ± 0.29	3.69 ± 0.38
• A/G ratio	1.22 ± 0.04	1.19 ± 0.17

** Significant at P $\leq$ 0.01

* Significant at P $\leq$ 0.05.

(1971).

RESULTS

Table (1) disclosed that there was a remarkable increase in serum levels of alkaline phosphatase, ALT, AST, bilirubin, urea, creatinine, triglycerides and cholesterol following osstrogen treatment.

DISCUSSION

The results of the present study showed that oestradiol administration led to a significant elevation in serum levels of alkaline phosphatase, alanine aminotransferase (ALT), aspartate aminotransferase (AST) and bilirubin as compared with their corrosponding levels in the control. These findings take a support from previous studies carried out in females by (Carlstroma et al., 1965; Abdel-Kader et al., 1979; Zeinab, 1984 and Fakhry et al., 1988).

Elevation of these blood parameters are indicative to liver cells damage (Benjamin, 1979 and Varley et al., 1980). Previous studies in females disclosed that administration of high level of oestrogens had a drastic effect on hepatic cells resulting in their degeneration and necrosis (Vantienhoven, 1968; Zienab et al., 1984 and Fakhry et al., 1988).

Table (1) displayed that administration of oestradiol to male rats lead to hypercholesterolemia. Liver is considered the main organ that synthesize and excrete cholesterol as bile acid and salts within bile (Murray et al., 1988). The rise of bilirubin, alkaline phosphatase, ALT and AST in the serum male rats administered oestradiol is indicative to the inability of damaged hepatocytes to excrete cholesterol.

The results of the present study showed that, there was increased level of triglycerides compared with control group. This result can explained by fact that oestrogen stimulate triglycericle synthesis by incorporation of acetate into lipid (Harper et al., 1979 and Murray et al., 1988).

Regarding kidney function, it was found that administration of oestradiol to male rats resulted in a significant rise in serum creatinine and urea (Table, 1). The increase in serum levels of creatinine and urea gives a clue of kidney functions disorders (Varely et al., 1980 and Murray et al., 1988). These findings coincide with previous reports carried out in female animals administered high dose levels of oestrogens (Abdel-Kader, et al., 1979; Zienab et al., 1984 and Fakhry et al., 1988).

From the present study it is concluded that administration of oestradiol at high dose rate to mature male rats has a serious harmful effects on hepatorenal functions.

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