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## **Role of silymarin on the some serum sex hormones and oxidant\ antioxidant parameters in during Lactation period on female rats**

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**Abstract**---Objective: To see how dosage of Silymarin effect on some serum prolactin, estrogen and progesterone and some oxidant\ antioxidant in serum samples of female experimental rats throughout nursing. Methods: Twenty-four adult healthy, pregnant rats were divided into two groups (12rats/group) and treated as follows for ten days. G 1 were intubated orally distal water serving as control while, G 2 were intubated orally Silymarin (200 mg\kg\day), the following criteria were measured serum prolactin, estrogen, progesterone hormones, GSH, MDA, SOD and CAT. Results: The findings show that Silymarin had a significant increase influence in serum prolactin, estrogen hormone, SOD, CAT, MDA and a significant decrease in Progesterone and GSH. Conclusion: The focus of this study mention a new evidence of the role of Silymarin on the increasing prolactin, estrogen & progesterone hormones hormone and effect on some level of oxidant\ antioxidant.

**Keywords**---Silymarin, prolactin, estrogen, progesterone, oxidant\ antioxidant, rats.

## Introduction

For nearly 2,000 years, milk thistle (*Silybum marianum* L. Gaertn, Asteraceae) has been utilized in medicine. It's been widely utilized to treat a variety of liver problems. anti-inflammatory and antioxidant properties (1). Silymarin is made up of 4 flavonolignans in a complex mixture (isosilybin- silybin- silychristin and silydianin). The most important and active component of silymarin is silybin, which is essential for the pharmacological properties of silymarin (2). Silymarin has a variety of benefits for treating liver disorders, including the protect the liver from injury and ability to inhibit hepatotoxin binding to receptor sites, the ability to decrease glutathione oxidation and increase its own level in the liver, increase hepatocyte protein synthesis. additionally and the ability to stabilize the liver cell membrane , By lowering blood lipids and decreasing platelet aggregation, silymarin can help to avoid diabetes and atheroma (2). its content varies significantly amongst silymarin extracts, potentially altering its biological function. However, silymarin extract has been shown to boost milk yield in nursing mothers, as well as to improve bovine,  $\beta$ -casein gene expression and murine mammary cell proliferation. (3). Because silymarin dramatically elevated prolactin in female rats, this effect was done in part through dopamine receptors, the observed favorable effect of silymarin on breastfeeding performance could be attributed to higher prolactin concentration (1-4). There are numerous mechanisms by which silymarin can oxidative state and increase antioxidant defense mechanisms (5), and its protective impact against systemic oxidative stress has recently been established in late-pregnancy animals (2). The dose of silymarin required to elicit an antioxidant effect is expected to be less than that required to increase milk supply (4).

Prolactin (PRL), a 23-kDa polypeptide hormone released by mammothrophs cells of the anterior lobe (6). Endocrine neurons in the hypothalamus modulate prolactin excretion by secreting dopamine, which acts on dopamine receptors on mammothrophs to limit PRL synthesis (7). Prolactin (PRL) is a hormone that affects both women and men's maternal health. It encourages mammary glands to produce milk (lactation); higher PRL serum levels during gestation promote expansion of the mammary glands of the breasts and prepare them for dairy production. PRL also regulates androgens hormone secretion (8). PRL levels that are far too excessive lower estrogen concentrations in female and testosterone amounts in males. The consequences of modestly raised PRL levels are far more varied, as estrogen levels in women can increase or drop significantly (9).

Lactotroph cells in the anterior pituitary are the principal producers of prolactin. Dopamine produced from tuberoinfundibular dopaminergic (TIDA) neurons has an inhibitory effect on PRL (10). Despite numerous attempts to identify PRL in neurological areas using various methodologies, the brain's ability to synthesize PRL has really been called into question. Immunocytochemistry was used to locate PRL responsive neurons in men and females of several mammals (6). Nevertheless, the Organization estimates approximately 1.5 million infants die each and every year due to a lack of lactation or insufficient dairy (11). Phenotypically, prolactin release rises throughout pregnancy and after nursing to the point where prolactin quantity is 20 times greater than usual throughout gestation (12).

**The focus of this study**

was to learn more about the reproductive hormones level, in addition including oxidant\ antioxidant levels during administration of Silymarin during lactation.

**Material & Methods Experimental protocol**

Twenty-four female rats weight of rats (190-250 g) and their ages between (10 -12 weeks) , The animals were kept in an unique plastic cage in the (College of Veterinary Medicine - University of Karbala) animal house, provided the animals with the appropriate conditions. Females were mated with adult males in order to induce pregnancy. The females were randomly divided into two groups (12 each group). After the end of pregnancy and the occurrence of childbirth, the lactating females were started to be dosed from the first day of birth until the tenth day after birth., G 1 were intubated orally tap water serving as control while, G 2 were intubated orally silymarin (200 mg\kg\day) (13).

**Estimation of Hormones prolactin, Estrogen & Progesterone in serum**

The level of prolactin, Estrogen and Progesterone hormones were measured use a Kit Specific to measure hormone level depending on the method according to the instructions of producing company of ELIZA Kit, (14).

**Statistical analysis**

The data were normally distributed, as determined by the D'Agostino and Pearson normality tests, and were reported as means with  $\pm$  standard error of mean (SEM). Student's t-test was used to establish statistical significance between two conditions. The data was analyzed with Graph Pad Prism 9.0 for Windows, and the statistical significance level was ( $P < 0.05$ )

**Results & Discussions****Reproductive hormones**

The influence of Silymarin on prolactin, Estrogen & Progesterone hormones was investigated in the present study. This finding akin with (15) that describe the pituitary gonadal axis effectives with medicine herbs for maintenance of reproductive hormones, It has been claimed that silymarin extracts increase milk supply in lactating mothers, improve bovine, increase  $\beta$ -casein gene expression and murine mammary cell proliferation. (3). Findings demonstrate that progesterone levels are declining whereas estrogen levels are significantly gained in postnatal treated groups with Silymarin in treated group comparison to control group ( $p < 0.05$ ) (Figure 1). This work supports the findings of (16, 17, 18) showing prolactin significantly increase and has a variety of functions, including maintaining mammary gland production, acting in tandem with androgens, and affecting androgen metabolic activity. Furthermore, many studies have found that oral administration of aqueous extracts of medicinal herbs causes a considerable drop in progesterone levels, which is consistent with our findings (19). In addition, the decline of Estrogen in present study indicate the inhibited effectness of Silymarin, whereas the progesterone raised on the gonadotrophs cells in pituitary gland.

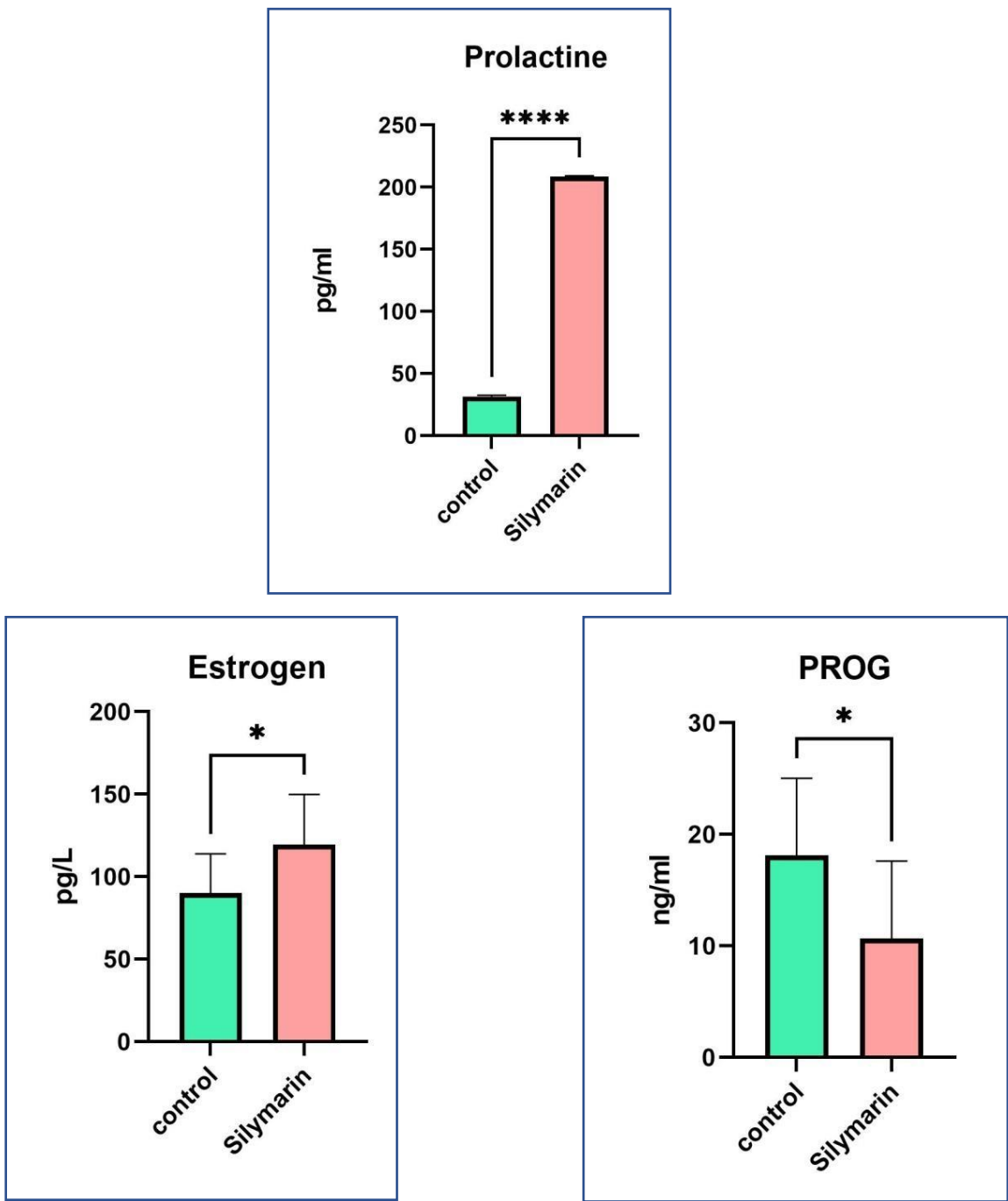


Figure 1: Role of orally intubated 200 mg\kg\day of silymarin on prolactin hormone, estrogen and progesterone level during lactation period in the rats

The main value of serum MDA , SOD and CAT show a significant increases ( $p \leq 0.05$ ) in G2 when compared with G1, Also showed a significant increases ( $p \leq 0.05$ ) in serum GSH in G1 group when compared with G2 (Figure 2). These results agreed with (4, 18) Silymarin has a variety of benefits for treating liver disorders, including the ability to inhibit hepatotoxin binding to receptor sites and protect the liver from injury, increase glutathione levels in the liver, the ability to reduce glutathione oxidation, increase hepatocyte protein synthesis and the ability to stabilize the cell membrane of the liver, In addition to its anti-oxidant effect (2).

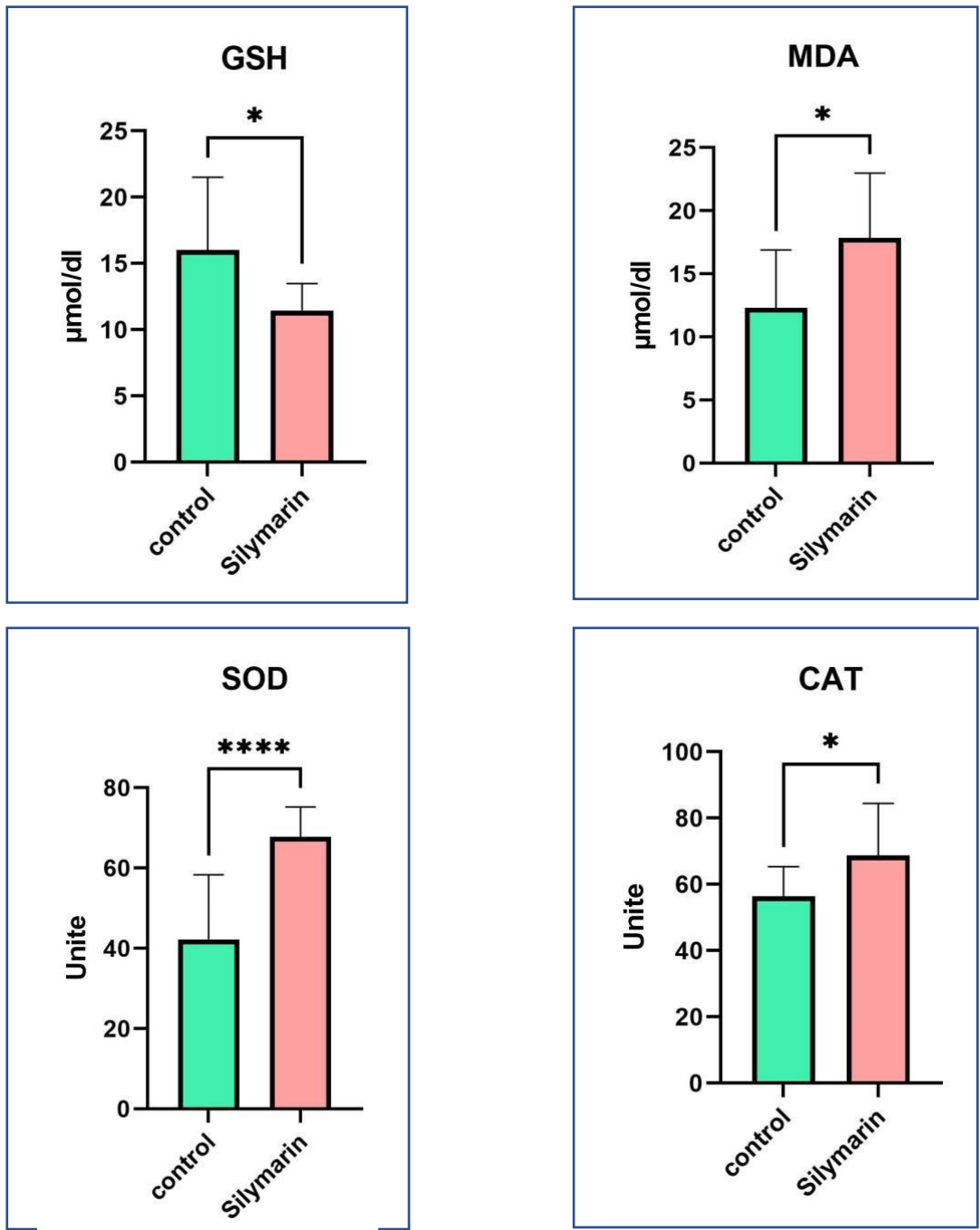


Figure 2: Role of orally intubated 200 mg/kg/day of silymarin on serum MDA, GSH, SOD and CAT level during lactation period in the rats

## Conclusion

The current study provides further evidence for the participation of silymarin in several physiological properties and the amount of prolactin, Estrogen & Progesterone in the serum, in addition to its effect on oxidative stress and antioxidants.

## Acknowledgments

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