PROLACTIN DURING NORMAL PREGNANCY, LABOUR AND PUERPERIUM

E S S A Y

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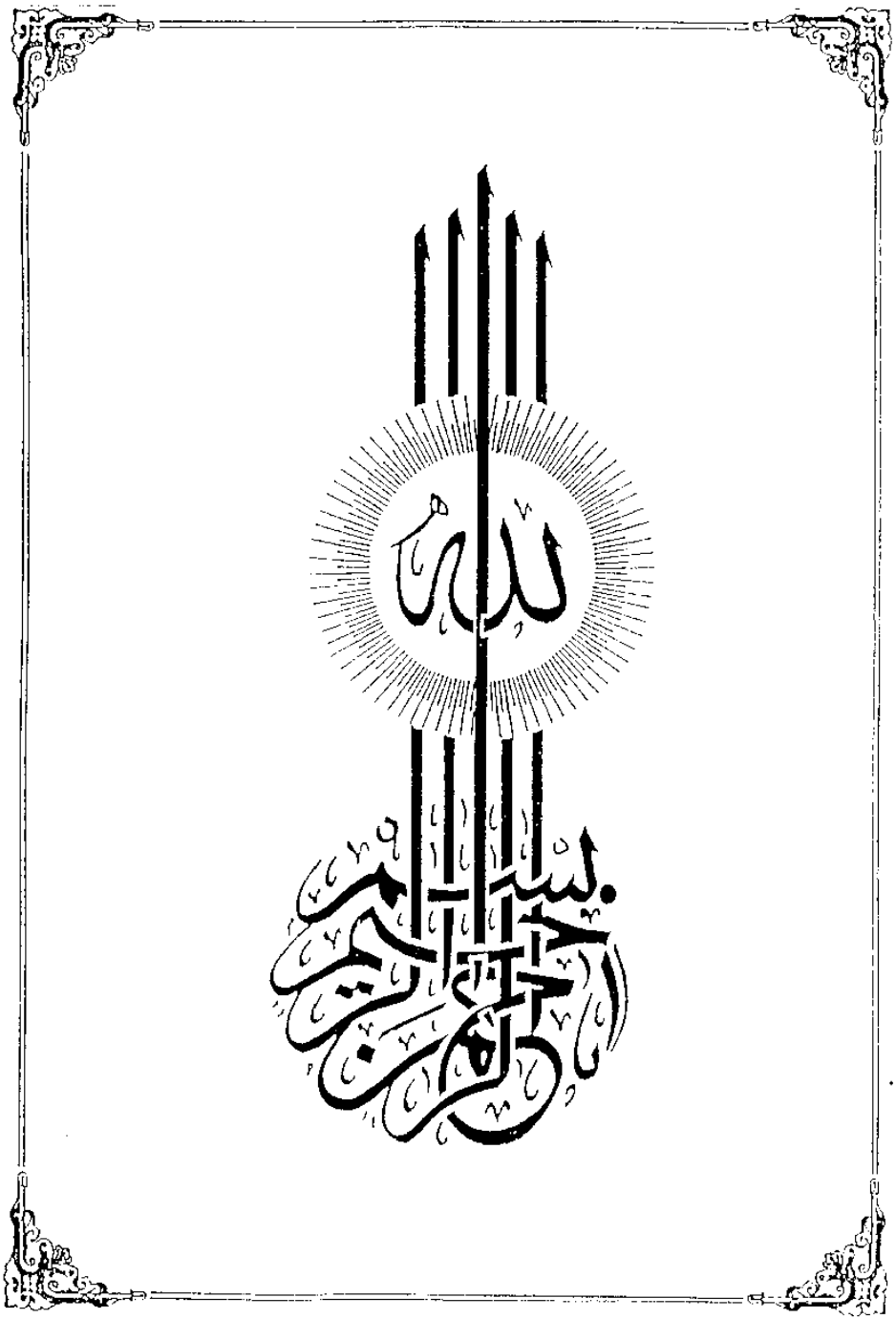

TO MY HUSBAND AND

MY LITTLE KID

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I N T R O D U C T I O N

The literature concerning prolactin levels during normal and abnormal pregnancy is contadictory. During pregnancy, peripheral level of serum prolactin rises progressively in relation to the duration of gestation (Tyson et al, I972). Gregoriou et al (I979), reported a significant fall in serum prolactin after the onset of labour, at time of cervical dilatation, at time of delivery and on the second and fifth days postpartum.

Josimovich and Archer (I977), reported that prolactin possesses mammotrophic, fetal osmoregulatory and steroidogenic roles, which appear to protect the uterine content during late pregnancy and prepare the fetus for the changes at the time of delivery. A possible role of amniotic fluid prolactin in fetal lung maturation has also been proposed (Hauth et al, I978).

Few authors studied prolactin levels in abnormal pregnancy. Sadovsky et al,(I977) and Ranta et al (I980) reported that serum prolactin values in patients with preeclampsia and latent diabetes were found not to differ significantly from values observed in normal pregnancy. On the other hand, Jenkins and Perry (I978), showed a positive correlaction between plasma prolactin concentration at the end of the third trimester and the degree of elevation of diastolic blood pressure. Biswas and Rodeck (I976), reported that prolactin level was elevated only in 7% of hypertensive pregnancies. Contradictory to these results, Ho Yuen et al (I978), reported that serum prolactin was significantly lowered in preeclampsia.

In normal pregnancy, amniotic fluid prolactin was found to be only 2 to IO folds higher than the corresponding levels of the mother serum (Schenker et al, I975), while Tyson et al (1972), reported that it may reach up to one hudred times the maternal or fetal blood levels.

To our knowledge, serum prolactin levels and the curve for this hormone during normal pregnancy has not been done in Egyptian women.

AIM OF WORK

Review of the literature on prolactin during normal pregnancy, labour and puerperium.

REVIEW OF LITERATURE

NON PREGNANT STATE

IN

PROLACTIN

PRODUCTION AND CHEMISTRY

Prolactin was first isolated and identified as a distinct pituitary hormone in 1971 (Wolstenholme and Knight, 1972).

Human pituitary prolactin is secreted by the lactotrophic cells in the lateral wing of the anterior pituitary gland, together with the cells that produce the growth hormone. Prolactin is synthesized within the cisternae of the endoplasmic reticulum. It is packed by Golgi apparatus into small membrane bound granules, which mature into larger acidophilic secretory granules. The contents of the granules remain in the cytoplasm until they are secreted by exocytosis resulting from fusion of the membrane of the granules and that of the cell (Chang, 1974).

Human prolactin was isolated and found to be made of a single chain polypeptide of 198 amino acid residues with three disulfide bridges and its molecule has leucine as the NH_2 terminal residue. Recently, the entire linear amino acid sequence of human prolactin was described ('figuers 1 & 2' Shome and Parlow, 1977 - Ganong, 1981).

There is great homology or similarity in the amino acids sequence of human placental lactogen, growth hormone and prolactin, and even an overlap in their biological functions (Li, 1972).

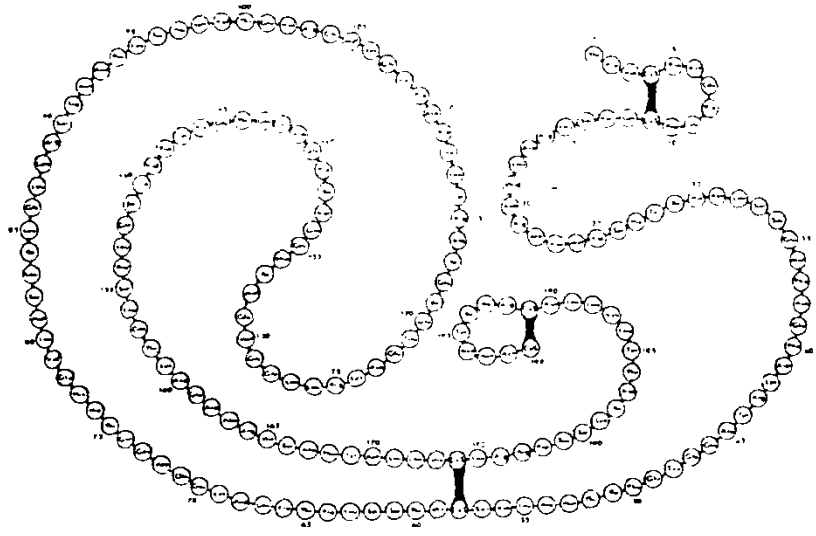

Fig. 1 Ovine prolactin. The black bars indicate disulfide bridges.
After Ganong, W.F. Review of Medical Physiology, 10th ed., Land Medical Publications P.321, (1981).

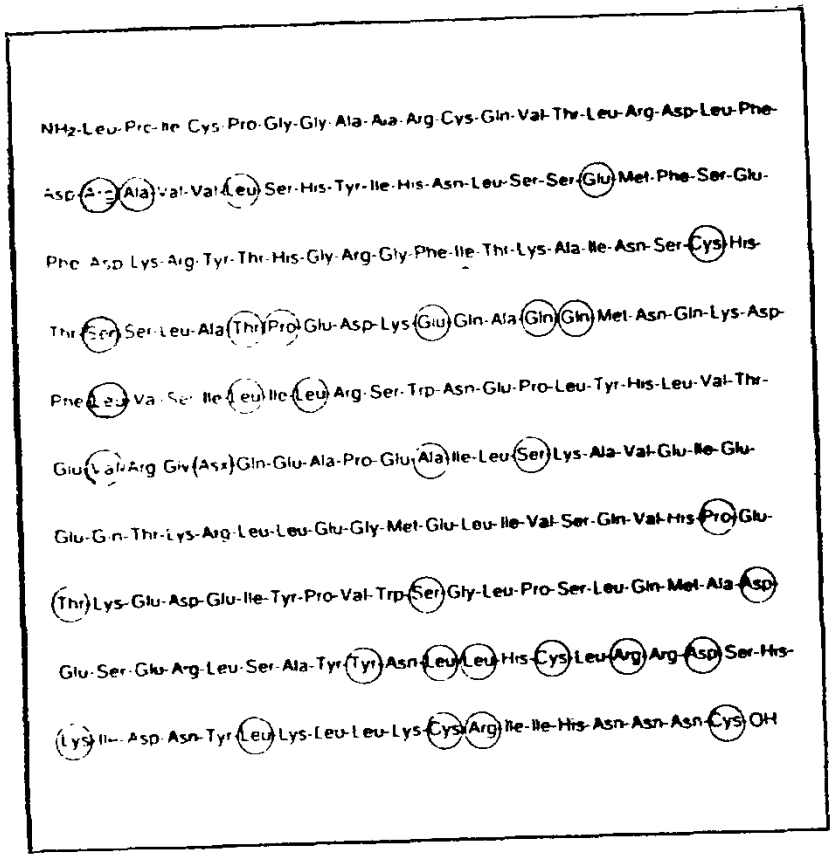

Fig. 2 The linear amino acid sequence of human pituitary prolactin. Encircled residues, only, are identical with human growth hormone sequence.
After Shome and Parlow. J. Clin. Invest., 45: 1112, (1977).

CONTROL OF PROLACTIN SECRETION

Half Life of Plasma Prolactin :

The rate of disappearance of prolactin from the plasma, its distribution in the body fluids and its secretory rate have not been definitively studied. The rapid fall of plasma prolactin level after L-dopa administration suggests a half-life of 20 to 30 minutes in the plasma (Williams, 1974). Ehara et al (1973), suggested a half-life of prolactin to be approximately 43 minutes while Saxena (1977), estimated it to be 14 minutes.

Prolactin Inhibiting Factor :

Prolactin, being an anterior pituitary hormone, is under the control of the hypothalamus. Its secretion is tonically inhibited by the hypothalamus due to a hypothalamic prolactin - inhibiting hormone . Pituitary stalk section which disrupts the pituitary portal system, results in cessation of follicle stimulating hormone and luteinizing hormone secretion, and increase of prolactin secretion (Turkington et al, 1971). Practically all stalk sectioned female patients develop amenorrhoea and galactorrhoea (Benjamin and Deutsch, 1980). All hypothalamic releasing and inhibiting factors are produced by specific areas or centres in the hypothalamus. It is only when the prolactin - inhibiting centre stops secreting the prolactin inhibiting factor that pituitary secrets excess prolactin and lactation occurs (Benjamin and Deutsch, 1980). There is evidence that prolactin and growth hormone appear to act on the hypothalamus to regulate the secretion of their releasing and/or inhibiting hormones (short loop feed-back mechanism), and that the hypothalamic hormones can inhibit their own secretion