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LEPTIN, AN ADIPOCYTE HORMONE AS A MODULATOR OF REPRODUCTIVE FUNCTION: EXPERIENCES FROM A SRI LANKAN LABORATORY

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Leptin, one of the adipocyte hormones is now recognized as a modulator of reproductive function. It has been shown to act at all levels of the hypothalamic-pituitary-gonadal axis. Recently leptin has been shown to act on the endometrium. Placental leptin is also implicated in fetal growth and development.

In view of leptin being recognized as the hormone that signals nutritional status of the organism to the reproductive axis, we investigated the possible role of leptin in early resumption of menstruation in well-nourished lactating women. These studies showed that serum leptin level was not a major determinant of resumption of menstruation in well nourished lactating women. Possibility of a subtle difference in leptin action by way of leptin receptor polymorphism is being investigated, and the results to date does not suggest a difference in the leptin receptor polymorphism between lactating women who resume menstruation early or late despite having similar serum leptin levels. Our ongoing studies on the role of leptin in pregnancy and fetal growth have shown that maternal serum leptin increases until the 28th week of amenorrhea and plateaus thereafter, despite the continued increase in maternal weight and body mass index. In gestational diabetes mellitus, cord blood leptin levels were elevated even when accounted for the ponderal index suggesting that leptin plays a role in metabolic derangement that develops during the adult life in these babies.

In view of the recent observations indicating leptin receptor defects in some women with infertility and the role of prolactin and the insulin-like growth factor system (IGF) in endometrial function we investigated the effect of leptin on the endometrium using a rodent model. Our work to date have shown that exogenous leptin increases prolactin secretion by cultured rat endometrial stromal cells in a dose and time dependent manner but has no effect on IGF-I or IGF binding protein-1. Furthermore, leptin and leptin receptor expression in the rat uterus appears to be modulated by the estrus cycle.