

This Week's Citation Classic

Tyson J E, Hwang P, Guyda H & Friesen H G. Studies of prolactin secretion in human pregnancy. *Amer. J. Obstet. Gynecol.* 113:14-20, 1972.
[Dept. Gynecology and Obstetrics, Johns Hopkins Univ. Sch. Med., Baltimore, MD and McGill Univ. Clinic, Royal Victoria Hosp., Montreal, Quebec, Canada]

This paper reported the rise in prolactin concentrations throughout human gestation and in the puerperium in response to suckling. Very high amniotic fluid prolactin levels compared to maternal and fetal blood levels suggested there was an extrapituitary source of prolactin production during pregnancy. [The SC® indicates that this paper has been cited in over 245 publications since 1972]

John E. Tyson
Department of Obstetrics, Gynecology, and
Reproductive Sciences
University of Manitoba
Winnipeg, Manitoba R3E 0W3
Canada

June 23, 1983

"In 1966, while a fellow in gynecology and obstetrics at Johns Hopkins Hospital, I participated in an investigation of pregnant women suffering from isolated growth hormone deficiency.¹ These women were known to experience postpartum lactation presumably in the absence of either pituitary growth hormone or prolactin. When Frantz and Kleinberg described prolactin-like activity in human serum using a mouse mammary gland bioassay,² Henry Friesen called me from McGill University asking if I could fly to Montreal with any blood samples left over from my lactating dwarf study. Like most November days, it was cold and damp when I arrived in Montreal. Peter Hwang, then a research fellow in Friesen's lab, was wrestling with the immunoassay for prolactin while Harvey Guyda, who had recently returned from the US, was perfecting techniques for affinity chromatography. Over the next six days we extracted my samples and assayed them for this ubiquitous pituitary polypeptide. By the weekend we were ecstatic to have found high prolactin-like activity in each and every sample.

"By late January 1971,¹ had completed the

first large study of the dynamics of prolactin secretion in pregnant and puerperal women. Friesen and I drafted an abstract from these results in time for the annual meeting of the Endocrine Society. The results, which formed the body of our paper, included the normal range for prolactin values for pregnancy, the suckling-induced prolactin response to nipple stimulation, and the levels of prolactin in amniotic fluid. I was later to describe along with others that a suckling-induced increment in prolactin is present beyond the 90th postpartum day.³ What had happened in our original study was an error in sampling which did not take into account the frequency and intensity of the suckling stimulus.

"There are several reasons for the high citation of this paper. Our original paper was replete with observational data, and the discussion included a number of personal hypotheses. These had been drawn up by Friesen and me as we sat in a small French restaurant during the November visit. Fantasizing over a glass of white wine, we arbitrarily divided up future research possibilities. Friesen was to expand his work on pituitary physiology and the role of prolactin in the etiology of mammary carcinoma. I was more interested in female reproduction. Our original article was the first to suggest that prolactin might be produced in extra-glandular sites during pregnancy. Since then, my lab has confirmed that amniotic fluid prolactin is synthesized by human decidua.⁴ Other studies have shown a definite effect of prolactin on fetoplacental osmoregulation.⁵⁻⁷

"The field of prolactin research has expanded exponentially during the last 12 years, yet the personal satisfaction which I obtained from those early 'lean years' in clinical research is inestimable. Unfortunately, in spite of nearly 13 years of basic and applied research, prolactin remains principally a marker of other disease processes especially in the area of the hypothalamus."

1. **Tyson J E, Barnes A C, Merimee T J & McKusick V A.** Isolated growth hormone deficiency: studies in pregnancy. *J. Clin. Endocrinol. Metab.* 31:147-52. 1970.
2. **Frantz A G & Kleinberg D L.** Prolactin: evidence that it is separate from growth hormone in human blood. *Science* 170:745-7. 1970.
3. **Tyson J E.** Nursing and prolactin secretion: principal determinants in the mediation of puerperal infertility. (Crosignani P G & Robyn C, eds.) *Prolactin and human reproduction*. London: Academic Press. 1977. p. 97-108.
4. Role of the human decidua in the elaboration of polypeptide hormones. (Choate J W, Dolan T E & Thiede H A, eds.) *Transcript of the Seventh Rochester Trophoblast Conference. October. 1977*. Rochester, NY: University of Rochester School of Medicine & Dentistry. 1977. p. 18-24.
5. **Leontic E A & Tyson J E.** Prolactin and fetal osmoregulation: water transport across isolated human amnion. *Amer. J. Physiol.* 232:R124-7. 1977.
6. **Leontic E A, Schrufer J J, Andreassen B, Pinto H & Tyson J E.** Further evidence for the role of prolactin on human fetoplacental osmoregulation. *Amer. J. Obstet. Gynecol.* 133:435-8. 1979.
7. **Tomita K, McCoshen J A, Fernandez C S & Tyson J E.** Immunologic and biologic characteristics of human decidua prolactin. *Amer. J. Obstet. Gynecol.* 142:420-6. 1982.