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Rapid Communication

DECLINE IN SERUM RELAXIN LEVELS BEFORE LABOR IN WOMEN

Katsuyoshi SEKI, Tadashi UESATO and Koichi KATO
Department of Obstetrics and Gynecology, National Defense Medical College, Saitama
Toru TABEI
Sekishindo Hospital, Saitama

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Introduction

In many species, relaxin plays a major role in cervical ripening before parturition[5]. In most animals, serum relaxin levels are highest shortly before parturition[5]. However, the role of relaxin in human parturition has not been established. Although Quagliarello et al. found no significant change in serum relaxin levels before labor[4], a cross-sectional study of normal sigleton pregnancies showed that, at term, relaxin levels in patients who went into spontaneous labor within a week of sampling were lower than in those who did not[2]. Because of the presence of individual variabilities, a reliable pattern of relaxin during the periparturitional period has yet to be established in women. We now report serum relaxin levels determined in serially collected samples, starting at the thirty-sixth week of gestation until 2 hours postpartum.

Materials and Methods

The subjects of this study were 6 healthy primigravidae with uncomplicated pregnancies. All women were 28 years of age or less, were sure of the date of the last menstrual period, and had had regular menstrual cycles before pregnancy. In all women, labor began within±14 days of predicted term. All women delivered of a single normal healthy infant weighing 2.7kg or more. Blood samples were taken at weekly intervals from the thirty-sixth week of gestation until the onset of spontaneous labor. Thereafter, blood samples were obtained at the time of established labor, at the time of crowning of the fetal head, and two hours after delivery.

Serum relaxin was measured by radioimmunoassay[3][8] as previously described[7]. Data are expressed as ng/ml equivalents of porcine relaxin. Statistical analyses were performed by means of Wilcoxon's rank test.

Results

When compared to serum relaxin levels 3 weeks before the onset of spontaneous labor, serum relaxin levels were significantly lower 1 week before the onset of labor and 2 hours after delivery, but were not significantly different at any other time (Fig. 1). Serum relaxin levels during labor were not significantly different from those 1, 2 or 3 weeks before the onset of spontaneous labor.

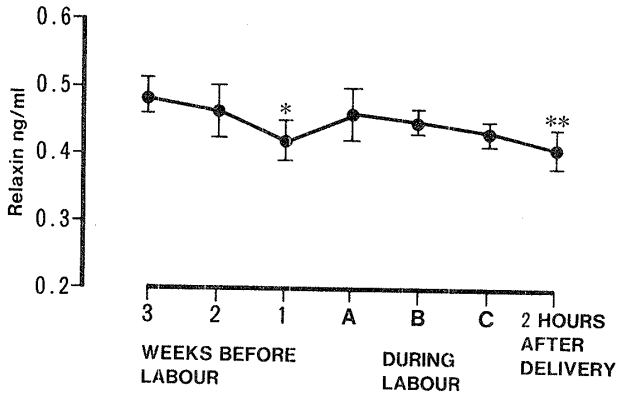

Fig. 1. Relaxin levels (mean±S.E.) during the periparturitional period. During labor, serum relaxin was measured at the onset of labor (A), at the time of established labor (B) and at the time of crowning of the fetal head (C).
*$p<0.05$, **$p<0.01$ vs relaxin concentrations 3 weeks before labor.

Discussion

The absence of a prelabor relaxin surge is in keeping with the results of Quagliarello et al.[4]. The decline in relaxin levels 1 week before the onset of spontaneous labor is not likely due to spontaneous, episodic secretion of relaxin, since neither episodic secretion of relaxin nor a 24-h rhythm in relaxin secretion was discernible in pregnant women[6]. The fall in relaxin levels is in agreement with the results of a cross-sectional study of MacLennan et al.[2] who found that at term, relaxin levels in patients who went into labor within a week of sampling were significantly lower than in those who did not. It is not clear whether the fall in relaxin levels before labor is causatively related to the onset of spontaneous labor. Based on the results of experiments carried out in rats, Jones and Summerlee[1] advanced a hypothesis that relaxin has a central action suppressing the release of oxytocin as well as a peripheral action on the myometrium and cervix. If one may assume that the inhibitory action of relaxin on oxytocin secretion is operative in women, a fall in relaxin levels may cause an increased release of oxytocin, which may, in turn, stimulate the onset of spontaneous labor. In contrast to the decline in serum relaxin levels 1 week before labor, serum relaxin levels during labor were not significantly different from those 3 weeks before labor. This finding suggests, but does not prove, an increased relaxin secretion during labor. MacLennan et al.[2] found increased serum relaxin values in samples collected within 2 days of spontaneous labor. Consequently, serum relaxin levels may rise in very early labor. The significant fall in relaxin levels 2 hours after delivery indicates a rapid clearance of circulating relaxin.

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