

PLASMA PROLACTIN IN PREGNANCY-INDUCED HYPERTENSION

(prolactin/pregnancy/hypertension)

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Possible relationships between prolactin production and pregnancy induced hypertension were studied. Plasma prolactin levels were significantly higher in women with a pregnancy induced hypertension (290 ± 113 ng/ml) than in normotensive pregnant women (146 ± 32 ng/ml). There was the positive correlation between blood pressure and plasma prolactin levels. Thus, prolactin, as related to pregnancy induced hypertension warrants further study.

Prolactin is secreted by acidophil cells of the pituitary gland and is under control by the hypothalamus. The actions of prolactin extend to mammary, gonadal and adrenal glands, gluco-metabolism and regulation of osmolar pressure.

The plasma prolactin levels steadily increase to about 200 ng/ml during pregnancy.

Saruta *et al.* (1) reported that serum prolactin levels were significantly higher in patients with essential hypertension. Stumpe *et al.* (2) reported that the secretion of prolactin was markedly increased and that administration of bromocriptine, a dopaminergic agonist, reduced the blood pressure in patients with essential hypertension (1,3). Thus, prolactin levels in hypertension have been given increasing attention (1,3). In the present work, we investigated possible relationships between prolactin and pregnancy-induced hypertension.

MATERIALS AND METHODS

Materials

Twenty patients with pregnancy-induced hypertension, and twenty normotensive pregnant controls were studied. Mean age,

Table I. CLINICAL DATA

	Number	mean age (years)	mean gestational age (weeks)	systolic BP (mmHg)	diastolic BP (mmHg)
normotensives	20	28.3 ± 3.4	34.8 ± 3.6	114 ± 12	66 ± 10
hypertensives	20	28.9 ± 3.5	35.8 ± 3.2	144 ± 13	90 ± 13

(m ± SD)

mean gestational age and blood pressure are shown in Table I. The subjects have been on no medication and on a normal unrestricted diet.

Pregnant women are considered to have a hypertension if one or more of the following are present (4):

- (1) systolic blood pressure of 140 mmHg or higher
- (2) diastolic blood pressure of 90 mmHg or higher
- (3) a rise of 30 mmHg or more above the prepregnant or early pregnant systolic blood pressure level
- (4) a rise of 15 mmHg or more above the prepregnant or early pregnant diastolic blood pressure level

Gestational age was estimated from last menstrual period and ultrasound examination.

Methods

Blood pressure was measured two times between 9.00 a.m. and 11.00 a.m. in supine position, and the average blood pressure level was used.

Blood sample was taken in supine position between 9.00 a.m. and 11.00 a.m., and was put into a tube containing EDTA. Plasma was separated and stored at -20°C until assayed.

Plasma prolactin concentration, expressed as ng/ml, was measured by the double antibody radioimmunoassay method, using the Amerlex PRL RIA KIT (Amersham Medical Limited). Plasma was diluted with two times saline solution (CV 3.2%).

RESULTS

Maternal plasma prolactin levels were significantly higher in case of pregnancy-induced hypertension than in normotensive pregnant subjects in the third trimester ($P < 0.05$) (Fig.1).

A positive correlation between blood pressure and plasma

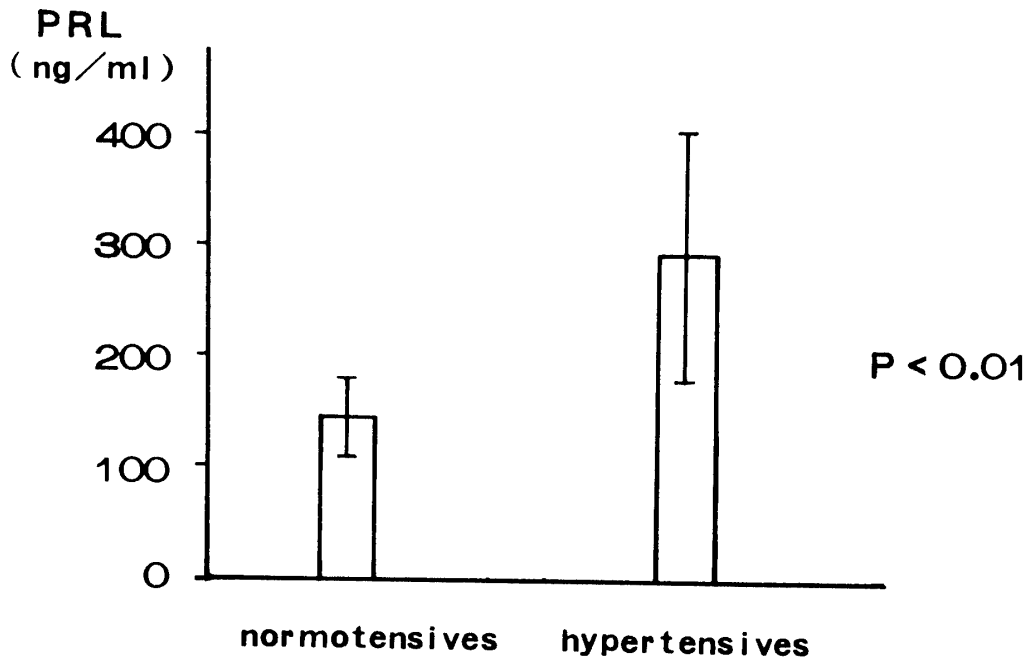


Fig.1. Plasma PRL in normotensive pregnant subjects and those with pregnancy-induced hypertension

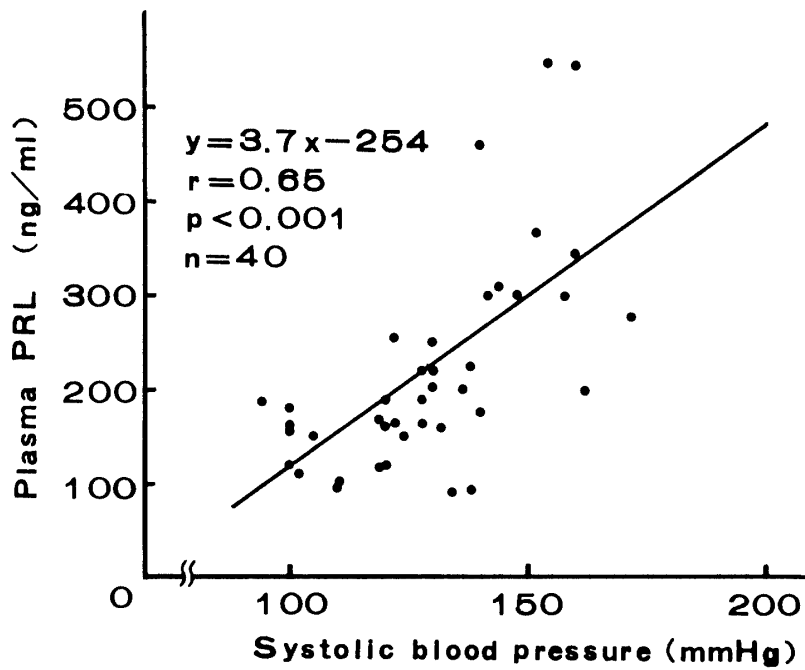


Fig.2. Correlation between systolic blood pressure and plasma PRL levels

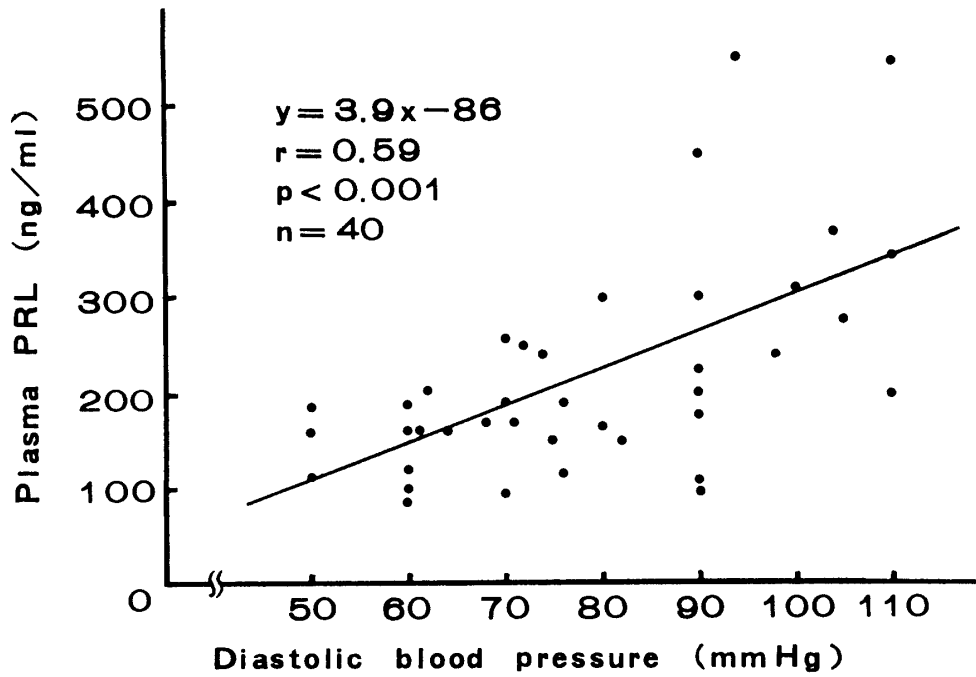


Fig.3. Correlation between diastolic blood pressure and plasma PRL levels

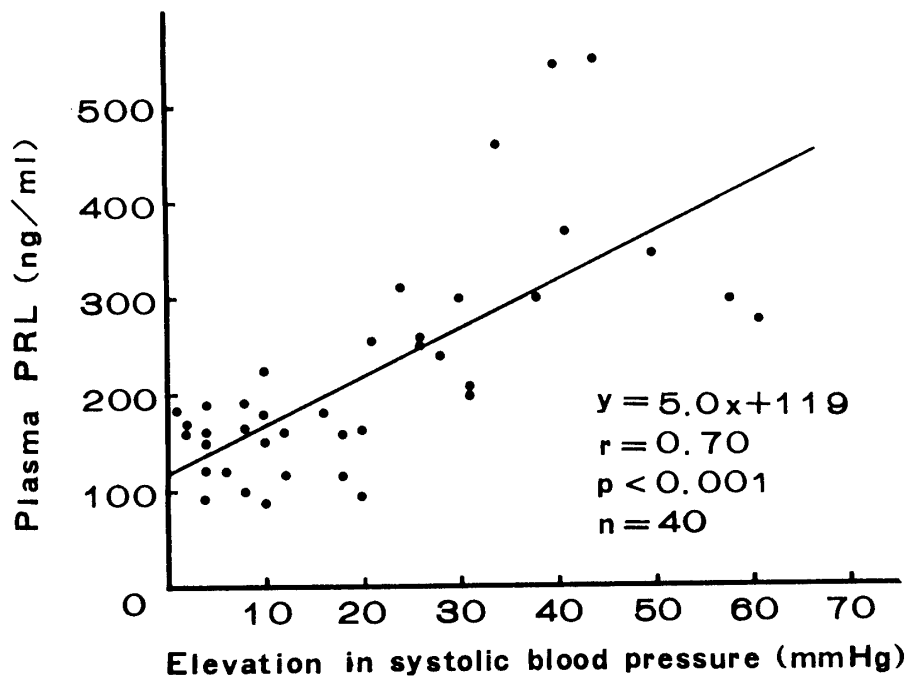


Fig.4. Correlation between elevation in systolic blood pressure and plasma PRL levels

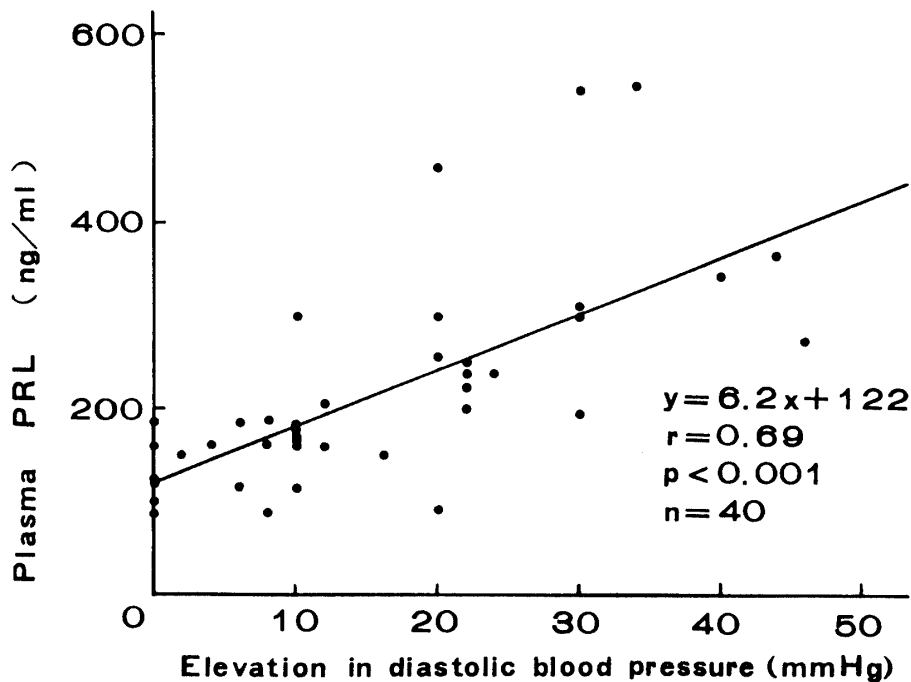


Fig.5. Correlation between elevation in diastolic blood pressure and plasma PRL levels

prolactin levels was found (Figs.2,3). The higher the blood pressure, the greater the increase in plasma prolactin ($P < 0.001$).

We found a positive correlation between elevation in blood pressure and plasma prolactin levels, as shown in Figs. 4 and 5 ($P < 0.001$).

DISCUSSION

It has been reported that serum prolactin values progressively increase by reaching peak values at 38-40 weeks of gestation (5,6,7).

Dubowitz *et al.* (8) found no significant differences in maternal prolactin levels between 12 hypertensive pregnant women and 5 normotensive pregnant women. Yuen *et al.* (9) reported that plasma prolactin levels were significantly lower than controls in the group with pre-eclampsia and in the group with essential hypertension.

On the other hand, Jenkins and Perry (10) and Hayashi *et al.* (11) reported that plasma prolactin levels were significantly elevated in case of pregnancy-induced hypertension.

In the present study, plasma prolactin levels were significantly increased in hypertensive pregnant subjects, as compared

with normotensive pregnant subjects, in the third trimester. Therefore, we support the report of Jenkins and Perry.

Horrobin (12) suggested that there was no relation between blood pressure and prolactin, however, we found the correlation between individual plasma prolactin levels and blood pressure (Figs.2,3), and found the correlation between elevation in blood pressure compared with that of prepregnancy or early pregnancy and plasma prolactin (Figs.4,5).

It is considered that the increased prolactin effect increases vascular sensitivity to vasoconstrictor agents such as angiotensin II and noradrenalin (13), and that prolactin has effects of fluid retention, thus plasma renin activity and aldosterone secretion are suppressed. It is known that plasma renin activity and plasma aldosterone decrease (14) and pressor responsiveness to angiotensin II increases in pregnancy-induced hypertension (15).

In these views, we suggest that prolactin may play a role in blood pressure regulation in pregnancy-induced hypertension, and prolactin may be able to use as a marker of prediction in pregnancy-induced hypertension.

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