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ALTERATIONS IN PLASMA FIBRINOGEN DURING LIFE EVENTS IN WOMEN

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Changes in plasma fibrinogen levels were observed in women during pregnancy, labour, postmenopause and after taking oral contraceptives. Mean fibrinogen level was highest at delivery, higher during pregnancy and high in postmenopausal women. Women who ceased menstruation with contraceptive drugs had lower values of plasma fibrinogen than control group.

INTRODUCTION

The natural stages of women's lives include childhood, puberty, menarche, pregnancy, delivery, lactation and menopause. Oral contraception, *in vitro* fertilization and hormonal replacement therapy are artificial events sometimes needed by a few women. All these conditions effects various endocrinological and physiological systems of the female's body. This may be the reason that coagulation screening tests are frequently requested from obstetric units in various diseases. A research worker reported that during pregnancy the concentrations of several coagulation factors increased[1] Another study documented a significant shortening of prothrombin time, partial thromboplastin time and thrombin time during labour[2]. Some scientists demonstrated a decrease in antithrombin levels in pill users [3]. Meade and his coworkers found a rise in plasma fibrinogen level in postmenopausal women [4]. While Bahakim et al observed low levels of the measured components of the hemostatic system in newborn children compared to adult values[5] Hence the coagulation parameters are commonly affected at different occasions in women's life. The present study was therefore, designed to determine fibrinogen levels in plasma during pregnancy, delivery, after menopause and oral contraception.

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MATERIALS AND METHODS

A total of 118 women of moderate socio-economic status were selected for this study (Table-1).

TABLE-1: DISTRIBUTION OF SUBJECTS

Status of Women	Numbers
Control (from nearby villages)	20
Menopause (from nearby villages)	21
Oral Contraceptive Use (Family Planning Centre)	16
Delivery (from Gyne Ward)	25
Pregnancy (from Gyne Ward)	
First Trimester	10
Second Trimester	12
Third Trimester	14
Total	118

The women of control group were unmarried, non-pregnant, had normal menstrual cycle, belonged to the same socio-economic status and had never used oral contraceptives. Age range of both group was 20-50 years. Information regarding height, weight, education, family members, family incomes, dietary history, life style, onset of puberty, menses frequency, age at marriage, gestational history, delivery history, parity and

history of medication was recorded from the related women. A scrutiny was done to exclude women with poor health, complications of pregnancy, chronic medical illness or had history of recent blood transfusion. Blood samples (3 ml) were collected during various trimesters of gestation, 1-2 hours before delivery, after menopause and 1-2 days after using estrogen-based oral contraceptives, and from control group between 2-10 days of normal menstrual cycles. 1.8 ml of blood was transferred immediately into a disposable dry glass tube containing 0.2 ml of 3.8 % w/v sodium citrate anticoagulant. The sample was centrifuged and plasma was separated. The fibrinogen level was determined by the clotting method [6].

RESULTS

The results of our analysis are given in Table-2.

TABLE-2: FIBRINOGEN LEVELS IN WOMEN.

Status of Women	Plasma Fibrinogen levels (mg/dl)	P value (compared to control)
Control	309.6 ±24.8	
Menopause	318.2±26.4	NS
Oral Contraceptive	286.4 ± 21.9	<0.001
Delivery	496.4±58.6	<0.000001
Pregnancy First Trimester	341.8±31.6	<0.001
Second Trimester	386.9±33.1	<0.00001
Third Trimester	460.5 ±46.3	<0.000001

Mean levels of fibrinogen in pregnant women was found higher than control and increased as pregnancy progresses. During labour eight women showed plasma fibrinogen level below 480 mg/dl, 14 between 480 and 500 mg/dl and 3 above 500 mg/dl. Control group during follicular phase of menstrual cycle had lower fibrinogen levels than postmenopausal women and higher fibrinogen levels than women with a history of taking oral contraceptives.

DISCUSSION

Female population has been facing many more life events as compared to male. These events affect hormonal, metabolic and hemostatic systems of their body. In the present study we observed the progressive increase in fibrinogen content from the first trimester onward. Similar findings were reported earlier[7,8]. A study documented that this increase in fibrinogen level is the result of increased synthesis by the liver[9]. Further elevation in fibrinogen levels occurred at delivery. Another study also gave similar results[5]. The increase on both occasions may be due to its greater demand for clotting of blood at parturition. This hypercoagulable state is potentially dangerous sometimes as it increases the risk of thromboembolic disorders which remain a major cause of maternal and neonatal morbidity and mortality [10]. Hence reference values for hemostatic variables are needed for early detection of these disorders.

Besides, postmenopausal women in our study had also increased levels of fibrinogen than control. Lee et al also observed higher plasma fibrinogen in postmenopausal women [1]. However, the exact cause of this elevation is not clear. Whereas, the lower fibrinogen in our women taking oral contraceptives might be due to less demand because of ceasing of regular menstruation. A previous study described that women who were menstruating had no different fibrinogen levels than those who had never used contraceptives, while in women who had ceased menstruation, fibrinogen level was lower. The present investigation also provides reference values of this changing parameter at various occasions in women's life to clinicians and laboratory personnel.

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