

SERUM CERULOPLASMIN IN CASES OF THREATENED BLEEDING IN EARLY PREGNANCY

by

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Copper along with various cuperoproteins have been suggested to influence the fetoplacental circulation and metabolism and ceruloplasmin has been claimed to be the index of placental function (Friedman *et al* 1969; Schenker *et al* 1969 and Burrows and Pekala 1969) and its values have been shown to correlate well with the urinary 17-ketogenic steroids and pregnanediol (Von-Studnitz and Berizine 1958). Ceruloplasmin have also been claimed to protect the abortifacient action of free serotonin, which gradually rises during pregnancy by way of its oxidation (Waugh and Pearl 1960 and O'Reilly and Loucin 19).

The present study was undertaken to evaluate the role of ceruloplasmin in cases of threatened bleeding, specifically its predictive value regarding outcome.

Material and Methods

A total of 66 cases presenting with vaginal bleeding during early pregnancy were studied. These comprised of 39 cases

resulting in abortion, 22 cases who continued till full term and 5 cases of missed abortion. Eighty-two cases of normal pregnancy in early stage and selected randomly served as control. The cases of bleeding were followed serially.

The serum ceruloplasmin estimation was done by colorimetric PPD-oxidase method of Ravin (1962).

Observations

During early normal gestation, a continuous gradual rise in the mean serum ceruloplasmin was observed (Table I). In cases of threatened bleeding the values at 0-2 days after bleeding did not differ statistically among those who aborted and those who continued till term; and also with control normal pregnancy values of respective week (Table I, II, III).

TABLE I
Serum Ceruloplasmin During Normal Pregnancy

Gestational week	Sample size	Serum ceruloplasmin (in mg% as mean S.D.)
8	6	35.0 \pm 4.8
9	11	39.2 \pm 5.3
10	5	41.3 \pm 4.2
11	7	43.6 \pm 5.2
12	15	44.9 \pm 3.8
13	10	44.3 \pm 4.7
14	12	47.2 \pm 3.9
15	5	49.2 \pm 5.3
16	11	52.1 \pm 4.9

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TABLE II

Serum Ceruloplasmin in Threatened Bleeding, Cases Those Continued to Full Term
(Cp in mg% as mean \pm S.D.)

Gestational week	One week before bleeding	0-2 days after bleeding	One week after bleeding
9	41.0 \pm 0.8 (3)	41.1 \pm 3.1 (6)	41.2 \pm 3.5 (5)
10	—	40.5 \pm 2.9 (7)	42.2 \pm 3.1 (4)
11	43.7 \pm 2.3 (2)	41.6 \pm 2.8 (4)	44.5 \pm 2.1 (3)
12	41.8 (1)	43.5 \pm 3.2 (3)	45.4 \pm 1.9 (2)
13	—	46.1 \pm 2.7 (2)	47.4 \pm 2.3 (2)
14	—	—	—

TABLE III

Serum Ceruloplasmin in Threatened Bleeding, Cases Those Aborted
(in mg% as mean \pm S.D.)

Gestational week	One week before bleeding	0-2 days after bleeding	One week after abortion
9	—	37.4 \pm 2.5 (2)	43.4 (1)
10	41.8 \pm 3.2 (5)	41.6 (1)	—
11	—	38.8 \pm 3.1 (15)	38.7 \pm 2.2 (3)
12	46.7 \pm 3.6 (3)	40.8 \pm 3.0 (6)	40.1 \pm 1.2 (2)
13	—	42.1 \pm 3.6 (10)	43.0 (1)
14	—	43.5 \pm 2.9 (5)	—

Fourteen samples collection one week before bleeding (6 cases continued till term and 8 cases aborted) also did not show any significant difference among each other and control (Table I, II, III).

In the cases who continued till term the values one week after bleeding remained in the range of normal pregnancy (Table

II). But, those who aborted, the value did not fall appreciably even after one week of abortion (Table III).

In 5 cases of missed abortion, the value, firstly remained in the normal range, but on subsequent estimations they rose to unexpectedly high levels (Table IV).

TABLE IV

Serum Ceruloplasmin in Cases of Missed Abortion

Case No.	0-2 days after bleeding	One week after bleeding	Two weeks after bleeding	Three weeks after bleeding
1	39.6 (10th week)	44.6	—	—
2	42.2 (10th week)	48.2	56.7	62.4
3	41.3 (11th week)	47.2	54.2	—
4	38.2 (11th week)	39.2	49.6	—
5	43.4 (11th week)	—	58.2	60.7

Discussion

Despite wide claims of serum ceruloplasmin to be the index of placental function and as reported by Heijkenskjold *et al* and Hedenstadt (1962) and Friedman *et al* (1969) that the lower values after bleeding lead to abortion, the present study shows that the values before and 0-2 days after bleeding do not show any relation with the outcome. Borglin and Heijkenskjold (1969) and Schanker *et al* (1969) have also said that the serum Cp values did not predict the outcome after bleeding.

Friedman *et al* (1969) further suggested that single value may not be of any help but a falling trend denotes the forthcoming abortion. In the present study the values, one week before bleeding, did not deviate significantly from normal pregnancy to indicate towards any forthcoming bleeding.

Borglin *et al* (1967) have found a significant fall in serum values, six weeks after abortion, therefore, in the present study the values, one week after abortion, remained almost in the same range.

The high values in cases of missed abortion, are in consonance with Buczek *et al* (1974).

In general, the present study denotes that the serum ceruloplasmin is a poor diagnostic index regarding abortion, but a suddenly rising trend did show that the foetus is doomed.

Summary

Sixty six cases of bleeding per vaginum during early pregnancy, along with 82

cases of normal pregnancy as control, were studied for serum ceruloplasmin level, to test its diagnostic importance regarding the outcome after bleeding. The serum ceruloplasmin estimations were done by PPD-oxidase method. Observations in the present series show that the serum ceruloplasmin values do not have any diagnostic importance regarding forthcoming bleeding and the outcome of bleeding. However, it was noted that a rising trend indicates a danger to the foetus.

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