

HAEMATOLOGICAL STUDY IN NORMAL AND TOXEMIC PREGNANCY AND ITS EFFECT ON THE BIRTH WEIGHT OF CHILD

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SUMMARY

There is significant fall in Hb% RBC count, haematocrit, platelet count and serum iron level, from study of normal and toxemia of pregnancy group of patients and this was more pronounced in toxemia group, and there is highly significant difference in birth weight in toxemia of pregnancy group in comparison to normal group. Birth weight was minimum in cases having low Hb% and serum iron level.

Introduction

Claude Bernard described blood as 'Millieu enteraur' which undergo changes in condition of stress. Pregnancy is a condition of stress which alters the metabolic functions to fulfil the requirement of growing foetus.

Haematological changes are well recognised during pregnancy while they are subject of vast difference of opinion in toxemia of pregnancy which is still an enigma and one of unsolved problems in obstetrics. However, association of toxemia and low birth weight baby is well recognized. The present study is undertaken to know the extent of correlation between haematological changes and low

birth weight baby in toxemia of pregnancy.

Material and Methods

The present study was conducted on 125 females admitted at P.B.M. Hospitals, Bikaner. Fifty of these were toxemic and 50 were of normal pregnancy group. Their age ranged from 15-35 years. 25 non-pregnant healthy females of matching age group acted as control.

A detailed history including the obstetric history, history of drug intake, previous infections were taken. Stress was laid upon their socio-economic group, dietary habits and literacy status (Prasad's classification, 1970).

Physiological examination comprised of general examination and examination of heart, lungs and B.P. Freshly passed urine was examined for presence of albumin and sugar.

Blood was collected during first stage of

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labour for haemoglobin % (Sahli's method), haematocrit, total red cell count, platelet count (Brecher and Cronkite, 1964) and serum iron estimation.

After ligating the cord, Apgar scoring of neonate was noted. Weight, sex of child and weight of placenta were also noted.

All observations were tabulated.

Observations and Discussion

The present study indicates a highly significant fall in the Hb%, RBC and PCV in normal and toxemic mothers when compared with non-pregnant group (Table I). There is general accord that Hb% level falls during pregnancy (Mukherjee and Mukherjee, 1953; Das, 1967). In present study, mean Hb% in control was 11.34 gm%, in normal pregnancy 9.35 gm% and in toxemic group, it was 7.37 gm%. Our findings are in consonance with the observers mentioned above. The mean RBC was 3.85 m/cmm in control group, 3.63 m/cmm in normal pregnancy, while 2.68 m/cmm in toxemic group (Table I).

Roscoe and Donaldson (1949) observed a study fall in Hb% level till the last

week of pregnancy. Ventura and Klopper (1951) attributed this fall entirely to the outcome of hydraemia of pregnancy. However, they did not find any change in the circulatory haemoglobin. Molly (1953) ascribed that this fall is due to iron deficiency anaemia than to increase in blood volume. Tysoe and Lowenstein (1950) found that increase in plasma volume and RBCs are not proportional hence results in physiological anaemia. Apte and Iyenger (1966) attributed this fall in Hb% is related to social status.

The mean PCV in control group was 38.04 ± 0.55 , in normal pregnancy 34.04 ± 0.29 and toxemic group it was 28.64 ± 0.39 (Table I). This statistically significant fall in PCV is in confirmation with the report of majority of workers. A significant reduction in platelet count in toxemia of pregnancy as observed by us (Table I) has been reported by Pritchard *et al* (1954). Starkie in 1971 suggested that the occurrence of intravascular clotting, particularly in platelet and renal circulation during toxemia of pregnancy leading to sequestration of active platelets and thus resulting in low peripheral

TABLE I
Haematocrit Values and Birth Weight of Baby and Placentae in Various Groups

	Control			Normal pregnancy			Toxaemia		
	Mean	S.E.	p	Mean	S.E.	p	Mean	S.E.	p
Hb%	11.34	0.19	—	9.35	0.10	.001	7.37	0.11	.001
TRBC count million/Cumm	3.85	0.06	—	3.63	0.03	.001	2.68	0.05	.001
P C V	38.04	0.55	—	34.82	0.29	.001	28.64	0.39	.001
Platelet count Lac/Cumm	3.41	0.10	—	2.76	0.02	.001	2.02	0.05	.001
Serum iron in ug%	85.08	1.72	—	66.88	0.48	.001	53.63	0.85	.001
Mean birth weight of baby/Kg	—	—	—	2.76	0.07	—	2.19	0.08	.001
Mean placental weight/gm	—	—	—	448.2	14.04	—	483.0	12.82	.05

platelet count. Pritchard *et al* (1976) noted thrombocytopenia in 29% of their cases. In present study, we found it more pronounced in most serious cases of toxemia.

A few workers have found a rise in platelet count during pregnancy (Rabaudi, 1907; Mor *et al*, 1960), while other found insignificant changes in platelet count (Tood *et al*, 1965).

Estimation of serum iron revealed a highly significant fall in the level in normal pregnancy and toxemia group (Table I). A decline in serum iron level during pregnancy was observed by Menon and Ramaswamy (1955). Krishna Menon in 1965 suggested that this fall is expressing mostly increased turnover of iron due to increased fetal demand for iron. The possibility of rise in plasma volume as a cause of relative fall in serum iron level is open for discussion. Enhanced absorption during pregnancy was observed by Hahn *et al* (1951). Therefore, it is suggested that low serum iron level to be an outcome of combined effect of low haemoglobin and iron deficiency.

On the other hand, few workers did not find any change in serum iron level (Sharma *et al*, 1958). Ventura and Klopfer (1951) stated that orientation of iron metabolism changes during pregnancy. The total serum iron being lowered without a significant change in total Hb% although the present study indicates fall in both parameters.

The low birth weight and IUGR is well accepted in cases of toxemia of pregnancy. In present study, the mean birth weight in normal pregnancy group has been found to be 2.762 Kg which is statistically higher than the birth weight in toxemic group (2.199 Kg). In placental weight there was minimum difference (Table I).

A study of birth weight in various socio-economic groups revealed that reduction in mean birth weight was statistically significant ($p > 0.01$) in toxemic group of social grades II and III, while it was not significant in IV and V grade. However, it is clearly shown that the birth weight has regularly fallen with the decrease in socio-economic status. The ultimate effect of both the toxemia and malnutrition resulted in low birth weight and our present findings are in agreement with findings of Chaudhry (1971).

Considering the effect of parity on weight, a highly statistically significant fall has been found in primi suffering from toxemia although results are also significant in para 2, 3 and 4. There was no significant effect on maternal weight gain during pregnancy on child birth weight literacy is also having insignificant relation to child birth weight which is not well explained in present study.

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