

A STUDY OF MICROANGIOPATHIC CHANGES IN PRE-ECLAMPTIC TOXAEMIA AND ECLAMPSIA BY BURR CELL STUDY IN PERIPHERAL BLOOD

by

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Introduction

Howie *et al* (1971) investigated extensively the coagulation changes in normal and toxæmic pregnancy and found microangiopathic changes due to intravascular coagulation which may be responsible for haemolysis of red blood cells leading to varying degree of anaemia. Therefore, the haemoglobin level in toxæmic patient may be of great help in therapy as a lowered level may be an expansion of fibrin deposition in the blood vessels.

Reid *et al* (1971) suggested that in the toxæmic pregnancy early changes consistent with hypercoagulable state may be discernable prior to a haemorrhagic state, which if recognised may be treated prior to the development of generalised fibrin deposition.

Material and Methods

A total of 120 females were selected.

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Detailed history and clinical examination was performed and they were grouped as follows:

1. Control group: included 20 normal third trimester females of matching age, parity and socioeconomic status.

2. Study group: included 100 females showing signs of toxæmia and were grouped as: shown in Table I.

TABLE I
Showing Distribution of Cases Under Study

Sl. No.	Cases (Test)	Number	Percentage
A	Pre-eclamptic toxæmia	78	78
	(i) Mild P.E.T.	38	48.7
	(ii) Moderate P.E.T.	24	30.7
	(iii) Severe P.E.T.	16	20.6
B	Eclampsia	22	22

The following is an account of tests employed in each case:

1. Haemoglobin estimation (Dasie and Lewis 1968).

2. Total leucocyte count was done using Thomas pipette and improved double ruling Neubaur counting chamber (Dacie 1968).

3. Differential leucocyte count was done (Dacie 1968).

4. Peripheral blood smears examined under oil immersion after Leishman stain and number of Burr cells were counted (Das Gupta 1975).

Observations

The distribution of cases is shown in Table I. Age and parity was the cases were studied in detail. In control group, 14 (70%) were primigravida (mean age 28.28) and 6 (30%) were multigravida (mean age 30.50). Out of 100 cases of toxæmia, 62 cases (68%) were primigravida (mean age 25.50) and 38 (38%) were multigravida (mean age 30.10), indicating that toxæmia is more common in young primigravida.

Haemoglobin level is shown in Table II and burr cells in Table III.

Discussion

In the present study it was found that out of 100 toxæmic cases, only 8 (8%) had normal haemoglobin and 92 (92%) had varying degree of anaemia. Severity of anaemia increased with increasing severity of toxæmia. The cause of anaemia was probably haemolysis of red blood cells or malnourishment. Howie *et al* (1971) investigated extensively the coagulation changes and found evidence of intravascular coagulation with microangiopathic changes causing varying degree of anaemia.

No burr cell was seen in the peripheral blood smear of control cases which in cases of toxæmia were increased according to the severity of the disease. In mild pre-eclamptic toxæmia, burr cells ranged

TABLE II
Haemoglobin Levels in Control and Test Cases

Hb Level in gm%	Control cases	Pre-eclampsia			Eclampsia cases
		Mild	Moderate	Sever	
Number of cases	20	38	24	16	22
Normal (10.5 and above)	20 (100%)	7 (18.42)	1 (4.16)	— (0)	— (0)
Mild Anemia (8.5 to 10.4)	— (0%)	30 (79.05)	13 (54.24)	3 (18.75)	1 (47.0)
Moderate Anemia (6.5 to 8.4)	— (0%)	1 (2.53)	10 (41.60)	10 (62.50)	11 (50.06)
Severe Anemia (Below 6.5)	— (0%)	— (0%)	— (0%)	3 (18.75)	10 (45.40)

TABLE III
Burr Cells in Control and Test Cases

Group of cases	No. of cases	Burr Cells in Number/H.P.F.	
		Range	Mean
Control cases	20	0	0
Mild P.E.T.	38	0-4	2
Moderate P.E.T.	24	5-8	6
Sever P.E.T.	16	9-11	10
Eclampsia	22	9-16	14

between 0-4 (mean 2) per high power field, in moderate ranged from 5-8 (mean 6) and in severe ranged from 9-10 (mean 10) per high power field. In eclampsia their number ranged from 9-16 (mean 14) per high power field. Burr cells are crenated red blood cells and are seen in toxæmia due to fibrin deposition on the blood vessel wall leading to the distortion in size and shape of red blood cells (Studd *et al* 1970). They are thus indirect evid-

ence of vascular changes due to fibrin deposition. Our findings are in accordance with those of Das Gupta (1975) who graded the blood film according to the number of Burr cells per high power field into Grade I (0-5/HPF), Grade II (6-10/HPF) and Grade III (11 or more HPF).

Conclusions

Following conclusions were drawn from the present study:

1. Toxaemia was found to be more common in young primigravidas.
2. Severity of anaemia in toxemic patients varied according to the increasing severity of the Toxaemia.

3. No burr cells were seen in control cases, while in all the cases of toxaemia these cells were present in the peripheral blood smears. Their number increased with increasing severity of the disease.

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