

PLATELET COUNTS IN TOXAEMIAS OF PREGNANCY

by

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Introduction

After initial animal experiments, a hypothesis was put forth to understand the pathogenesis of P.E.T. According to this the syncytiotrophoblast is damaged by a cause as yet unknown. This damage results in maternal platelet aggregation and agglutination at the site of damage. As a result, the platelets are damaged and they liberate platelet factor III. This enters into maternal circulation and initiates microthrombi formation resulting into more consumption of platelets.

Stahnke was the first one to observe thrombocytopenia in P.E.T. Similar results were obtained by Baker (1967), Bonnar (1969), and Davidson and Phillips (1972), and Agarwal and Buradkar (1978) however did not find thrombocytopenia in P.E.T. They observed thrombocytopenia only in cases of eclampsia.

In this study, serial platelet counts were performed in cases of P.E.T. and compared with those of normal pregnant patients.

Material and Methods

A total of 84 cases were studied. These were divided into 3 major groups.

Group A—Control group, 20 cases.

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Group B—Cases of pregnancy with toxæmia, 55 cases.

Group C—Cases in whom Roll Over Test was positive, 9 cases.

Group A: Twenty normal pregnant women were taken as controls. In 11 women platelet counts were performed every 4 weeks from 12 weeks to 28 weeks and thereafter every 2 weeks till term. Additional counts were performed on the same patients 24 hours and 7 days after delivery.

In the remaining 9 women, platelet counts were performed every 2 weeks from 28 weeks of gestation till term. The counts were repeated 24 hours and 7 days after delivery.

Group B: A total of 55 patients with hypertension and oedema and/or proteinuria were studied. This group was further divided in 4 sub groups according to severity of the disease.

(i) Mild P.E.T.—Fifteen patients with a diastolic pressure raised, but not more than 90 mm. of Hg.

(ii) Moderate P.E.T.—Fourteen patients were having diastolic pressure more than 90 mm. of Hg. but less than 110 mm of Hg.

(iii) Severe P.E.T.—This includes 15 patients having diastolic pressure more than 110 mm. of Hg.

(iv) Eclampsia—This includes 11 cases of either antepartum or intrapartum eclampsia.

In patients with mild, moderate and severe P.E.T., platelet counts were performed every 2 weeks till the delivery. Counts were repeated 24 hours and 7 days after delivery.

In eclamptic patients platelet counts were performed on admission and repeated 24 hours and 7 days after delivery.

Group C: Nine patients with positive Roll Over Test were studied. Platelet counts were performed every 2 weeks till delivery. Again repeat counts were done 24 hours and 7 days after delivery. Six of these patients developed mild P.E.T. on follow up during the remaining period of pregnancy.

For platelet count 2 ml. of venous blood was collected from each patient with a 5 ml. autoclaved siliconised glass syringe fitted with No. 20 gauge needle. The freshly collected blood was immediately transferred to a paraffin bulb containing 0.2 ml. of EDTA. The platelet count was performed by the Röss-Ecker method.

Observations

A majority of patients belonged to the age group between 20 to 29 years. This is shown in Table I.

TABLE I
Age Distribution

Age	Control group		Study group	
	No.	Percentage	No.	Percentage
15-19	4	20.00	7	10.93
20-24	14	70.00	42	65.62
25-29	2	10.00	13	20.31
30 and above	0	0.00	2	3.14
Total	20		64	

Table II shows that of the study group, 73 per cent patients were nulliparous.

TABLE II
Paritywise Distribution

Parity	Control group		Study group	
	No.	Percentage	No.	Percentage
Nullipara	11	55.00	47	73.43
Para I	5	25.00	9	14.06
Para II and above	4	20.00	8	12.51
Total	20		64	

Table III and Fig. 1 show the platelet counts in normal pregnancy and puerperium. The counts were almost same throughout normal pregnancy with an increase immediately after delivery and a further rise in the next 7 days. This rise is statistically insignificant.

From Table III and Figs. 1 and 2 it is apparent that platelet count decreases as severity of toxæmia increases.

The patients with a positive Roll Over Test did not show significantly different values from controls, although the values appeared lower at 38 and 40 weeks. This could be because of subsequent development of mild P.E.T. in six cases. This is shown in Table III and Fig. 2.

Discussion

Wintrobe (1951) has reported the platelet count in 80 healthy individuals to be 241,000/cu. mm. All the values of platelet count in the controls were found to be in this normal range. This is shown in Table III.

Ward and MacArthur (1948), Bonnar (1969) and Shaper (1968) however found a fall in platelet count during normal pregnancy.

TABLE III
Platelet Counts in Pregnancy and Puerperium in Controls, Mild, Moderate, Severe P.E.T. and Eclampsia

Study groups		Weeks of gestation										24 hours after delivery	7 days after delivery	
		12	16	20	24	28	30	32	34	36	38			40
1. Normal pregnant	Mean	2,57*	257	270	263	259	264	253	257	256	259	257	2,68 36	285 22
	S.D.	23	45	43	29	40	42	34	39	38	33	48		
2. Positive Roll Over Test	Mean	—	—	—	—	253	248	252	250	256	227	230	251 26	273 31
	S.D.	—	—	—	—	—	49	37	32	42	32	17		
3. Mild P.E.T.	Mean	—	—	—	—	—	—	—	177	173	191	184	184 54	259 40
	S.D.	—	—	—	—	—	—	—	24	38	36	44		
4. Moderate P.E.T.	Mean	—	—	—	—	—	160	127	143	135	139	125	158 47	261 49
	S.D.	—	—	—	—	—	—	33	22	23	34	—		
5. Severe P.E.T.	Mean	—	—	—	—	61	72	110	101	110	120	120	119 8	244 41
	S.D.	—	—	—	—	—	—	24	23	20	29	24		
BEFORE DELIVERY														
6. Eclampsia	Mean	—	—	—	—	—	102	—	—	—	—	—	118 49	242 74
	S.D.	—	—	—	—	—	31	—	—	—	—	—		

* Platelet counts in 1,000/cu. mm.
 S.D. not calculated where number of observations were less than 5.

On the contrary, Mor *et al* (1960) Saxena and Gaur (1978) reported rise in platelet count as pregnancy advanced.

After delivery, there appears to be a statistically insignificant rise in platelet count in the present series. Similar observations were made by Talbert (1964) and Todd *et al* (1968).

In the mild P.E.T. cases there was fall in platelet count. Figure 1 shows that some of the observations are within the range for normal pregnant women. These observations correlate with those obtained by McNicol (1971) but not with those obtained by Davidson (1972) and Agarwal and Buradkar (1978).

As P.E.T. progresses to moderate severity there occurs a further fall in platelet count. However, in this group also a few observations lie within the normal range for controls. This is apparent from the Fig. 1.

In severe P.E.T. the platelet counts drop further so that all the values lie below the range for normal pregnancy. This is shown in Fig. 1.

Howie and McNicol (1971) and Davidson and Phillips (1972) reported a fall in platelet count. Agarwal and Buradkar (1978) did not find a similar fall in platelet counts.

In cases of eclampsia, lower platelet counts were observed by all the authors. Figure 2 shows that each patient had platelet count significantly lower than control value for that period of gestation. Kistner (1950) Bonnar (1969) Birmingham Eclampsia Study Group (1971), Agarwal and Buradkar (1978) reported similar results.

The results obtained in the present study more or less corroborate with report of the other workers and more closely tally with those obtained by

Birmingham Eclampsia Study group (1971).

The platelet counts in cases with positive Roll Over Test were within normal limits. When the patients developed P.E.T. subsequently there was a slight fall in the platelet count but it was statistically insignificant. This is shown in Fig. 2.

This insignificant fall was probably because either P.E.T. was of mild degree or because most of the patients delivered within a few days of development of P.E.T. so that there was possibly very little time for the pathology to be reflected on the platelet count.

Summary and Conclusion

Lowering of platelet count appears to be a feature of P.E.T. It appears to be an effect rather than cause of P.E.T. Agglutination of platelets and intravascular coagulation is perhaps one of the side chain in the pathophysiology of P.E.T. Thus its occurrence does not materially affect the course of the disease. All the same, it may serve as a parameter to assess the severity of the condition. Whether this will help in foetal salvage in cases of P.E.T. remains to be worked out.

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