

# A STUDY OF TOTAL PLATELET COUNT, ADHESIVE PLATELET COUNT AND PLATELET ADHESIVENESS IN PREGNANCY, LABOUR AND PUERPERIUM†

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It is well known that the concentration in blood of some coagulation factors increase during pregnancy. In recent years it has become apparent that defects of coagulation mechanism during pregnancy is not an isolated phenomenon of simple hypofibrinogenemia, but, involves multiple factors. In pregnancy a 'hypercoagulable state' is produced by increase in several coagulation factors. The normal control of haemostasis during labour and immediately after delivery depends on myometrial activity, thrombotic process, local vascular behaviour, and, circulatory changes. Platelets, on account of their property to stick to each other, form a plug, thus participating in uterine haemostasis.

## Material and Methods

The present study, was undertaken in Departments of Obstetrics & Gynaecology and Physiology of Medical College, Jabalpur M.P. from 1-7-1971 to 31-12-1975. The clinical material consisted of 25 non-pregnant control cases, normal healthy females in first, second, and third trimesters of pregnancy (25 cases in each

group), 25 cases in first, second, and third stages of labour and 25 patients in normal puerperium.

One c.c., of venous blood was obtained from antecubital vein, and was transferred to a glass tube and wax-coated bottle. Platelet estimations were done according to the method of Rees and Ecker.

## Observations

The data so estimated was analysed according to age, parity. No influence of these factors was found on platelet values.

Total platelet count was found to rise with advance of pregnancy. There was an abrupt fall at the onset of labour. Then the platelet count started rising and on 7th day of puerperium it was maximum.

Platelet stickiness was lower than non-pregnant state at the onset of pregnancy. With advance of pregnancy it also showed a rise, followed by abrupt fall at the onset of labour. Again there was a rise in this value and was maximum during puerperium (Table ).

## Comments

Rise in platelet count during pregnancy was also noted by Mor *et al* (1960), but Talbert and Langdell (1964), Wintrobe (1951) and Ratnoff *et al* (1954) did not

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TABLE I  
 Mean platelet values in non-pregnant state, during Pregnancy, Labour and Puerperium

	Total platelet count	Adhesive platelet count	Platelet adhesiveness
Non-Pregnant Women	202000	38420	19.4%
Pregnancy			
I Trimester	218900	37700	17.4%
II Trimester	237550	51450	21.6%
III Trimester	248440	90224	36.3%
Labour			
I Stage	171138	74800	19.7%
II Stage	183216	120920	20.8%
III Stage	192862	121984	22.9%
Puerperium	360860	139000	38.9%

note any change in platelet values. On the other hand, Ward and Mac Arthur (1948) noted a fall in platelet values during pregnancy.

At the end of third trimester of pregnancy and beginning of labour, there was a considerable drop in platelet values. Similar findings were noted by Ward and MacArthur (1948), Wintrobe (1951), Kennan and Bell (1957), Mor *et al* (1960), Shaper and Mackintosh (1966), Shukla *et al* (1974). The variation in blood volume had no influence on platelet values (Shaper and Mackintosh 1966). The fall in platelet values at the end of pregnancy and beginning of labour could be attributed to a fall in plasma proteins (Ward and MacArthur 1948). Other attributing factors might be disintegration of platelets, release of 5-hydroxy tryptamine and thromboplastinogen to facilitate quick haemostasis. Possibility of progestational compounds playing an important role over platelet values could not be ruled out.

Sharp rise in platelet count in puerperium was noted by Dawarn *et al* (1928), Wright (1942), Shaper and

Mackintosh (1966), Mor *et al* (1960), and Shukla *et al* (1974).

During pregnancy there is a gradual rise in the concentration of factors I, VII, VIII, IX and X. There is a gradual normalization in the levels of factors I, VII and VIII, about 1-2 weeks after delivery (Ygge, 1969). The author showed that there was a decrease in the numbers of platelets during the first day of delivery. About a week postpartum, there was an increase in the number of platelets.

Increase in platelet adhesiveness was also noted by Shaper (1968) in pregnancy. It increased with advance of pregnancy. Wright (1942) and Shaper and Mackintosh (1966) found no change in platelet adhesiveness during pregnancy.

Wright (1942) and Hellem (1960) reported an increase in the platelet adhesiveness from 4th postpartum day, reaching maximum on 10th day. This increase in platelet adhesiveness was thought to be due to rapid liberation of young platelets into blood stream. Increase was also noted on day 14.

Shaper and Mackintosh (1968) showed that platelet adhesiveness increased im-

mediately after delivery, but it fell down by day 3rd to 5th.

Platelet 'aggregation' is, probably, the initial event in the 'in vivo' development of thrombus, as shown by Chandler's experiment (Shrivasa and Chandler, 1970).

The increased platelet adhesiveness on day 10th to 14th may account for thrombo-embolic phenomenon so commonly observed in puerperium.

Summary

Total platelet count, adhesive platelet count and platelet adhesiveness is studied in non-pregnant state, during pregnancy, labour and puerperium.

The causes for the variations in platelet count and adhesiveness are discussed.

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