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CASE REPORT

EVALUATION OF PLATELET COUNT AS A PROGNOSTIC INDEX IN ECLAMPSIA AND PRE ECLAMPSIA

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ABSTRACT

The most commonly identified hematological abnormality in pregnancy induced hypertension is thrombocytopenia. Early detection of thrombocytopenia is of paramount importance in the management of pre eclampsia and eclampsia. Decreased platelet count suggests increased platelet consumption which is an early feature of pre eclampsia. **Aim:** To evaluate platelet counts at frequent intervals in pre eclampsia and to assess its role as a prognostic tool in management. A followup study on 50 women with eclampsia and pre eclampsia along with a control group of 50 normal pregnant women with similar demographic features was undertaken. Platelet counts were estimated at frequent intervals in test group and at timed intervals in the control group. Thrombocytopenia thus detected was compared with the mean duration of pregnancy, mode of delivery, maternal and fetal outcome. **Result:** In the control group as there was no significant thrombocytopenia, the mean duration of pregnancy and maternal/fetal outcome was quite satisfactory with less operative intervention. Whereas in test group patients with significant thrombocytopenia the mean duration of pregnancy was reduced with higher incidences of either still birth, low birth weight babies, with an increase in operative intervention and life threatening maternal complications.

Keywords: Meningocele, Caudal block, Local anaesthetic

1. INTRODUCTION

Hypertensive disorders complicating pregnancy are common and form one of the deadly triad along with hemorrhage and infections that result in much of the maternal morbidity and mortality related to pregnancy. According to National Center for health statistics in 1998, hypertension in pregnancy was most common medical risk factor. Recent advances in research about pregnancy induced hypertension have facilitated a better general understanding of the pathophysiology of the disease. The incidence of pregnancy induced hypertension is between 6 and 15% in Primigravidas and 2 to 4% in Multigravidas. The incidence of preeclampsia is 5 to 7 % and incidence of eclampsia is 0.5 to 2% of all pregnancies. The condition is more frequent in obese women and in women with multiple gestation, diabetes, chronic hypertension and previous history of preeclampsia.

A number of classifications and definitions of various hypertensive disorders of pregnancy exist and new ones are being put forward constantly. The failure to achieve an

clinical or pathological features, or tests by which they can clearly be separated and the want of an agreed nomenclature. There are multiple possible causes of elevated blood pressure during pregnancy but the overwhelming majority of cases can be included into 5 well defined groups: chronic hypertension, gestational hypertension, Preeclampsia, Eclampsia, HELLP syndrome. Hematological abnormalities develop as a complication of preeclampsia. Out of all hematological changes that occur in preeclampsia and eclampsia, thrombocytopenia is most common hematological abnormality found. Thrombocytopenia is defined as platelet count less than $150 \times 10^9 /L$. Though in normal pregnancy there is no effect on platelet count, studies show that platelet counts might fall to some extent but not lesser than the normal range. This usually occurs during the third trimester and reverts back to normal immediately following delivery. Changes in platelet count is well established in preeclampsia and studies show, with evolution of severe preeclampsia there was a fall in circulating platelet count much earlier than expected.

Thrombocytopenia is attributed to two main causes. Failure of platelet production and early excessive platelet consumption, where the second cause is observed in eclampsia and pre eclampsia. Accelerated platelet activation and consumption is seen in normal pregnancy which

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explains the mild thrombocytopenia seen in normal patients and is termed as pregnancy associated thrombocytopenia or incidental thrombocytopenia. The incidence is 0.4 to 8.3%. In these cases the fetus is not at risk as perinatal outcome is quite satisfactory.

In preeclampsia, thrombocytopenia may occur without other evidence of coagulation disturbances. It probably occurs as a result of immunologically mediated process or more likely due to increased platelet deposition at the site of endothelial damage and activation of coagulation system in small vessels. Thus, there is an increased platelet activation and consumption and simultaneous increase in platelet production. Thus platelet life span is reduced and activation increased as evidenced by raise in beta thromboglobulin levels. It reflects the severity of the pathological process. More severe the thrombocytopenia, greater the maternal and fetal morbidity and mortality. After delivery, the platelet count will progressively increase and return to normal. Thus the treatment for progressive preeclampsia including thrombocytopenia is immediate delivery irrespective of gestational age.

HELLP syndrome is a severe form of preeclampsia and involves hemolytic anemia, elevated liver function tests and low platelet counts. The pathophysiology remains unclear. The findings of this multi system disease are attributed to abnormal vascular tone, vasospasm and coagulation defects. No precipitating factor has been found till date. This syndrome occurs as final manifestation of a series of endothelial damage and intravascular platelet activation. With platelet activation thromboxane A and serotonin are released, causing vasospasm, platelet agglutination and aggregation, and further endothelial damage. This begins a cascade that is only terminated after delivery.

The aim of the study is the early detection of platelet count abnormalities in preeclampsia and eclampsia, which is a sign of worsening disease. Thus facilitating early detection of maternal and fetal complications, thereby its role as prognostic tool in management.

2.MATERIALS AND METHODS:

The study group included 50 women with pre eclampsia and eclampsia with varying severity and duration of pregnancy. The control group included 50 women with similar demographic features and no associated complications. All the cases were selected from antenatal clinic, labor room and ward of obstetrics and gynecology department. A demographic sheet and laboratory tests were used in this study. The demographic sheet included information about the name, age, parity of patient, duration of amenorrhoea, last menstrual period, expected date of delivery, obstetric formula, compliant of the patient if any, blood pressure, systemic examination, abdominal examination, per speculum and per vaginal examination, mode of delivery, complications if any, baby details, investigations mainly platelet count done at interval along with other PIH investigations and USG.

After completing the demographic sheet, all the patients taken up for study were subjected to laboratory investigations. 5ml of venous blood sample were aspirated

from the participants ante cubital vein and mixed with EDTA (Ethylene diamine triacetic acid). The blood is mixed well and placed on a rack in an analyzer. The instrument has flow cells, photometers and apertures that analyses different elements in the blood. The cell counting components counts the number and types of different cells in the blood. The results are printed.

Blood counting machine aspirates a very small amount of the sample through narrow tube followed by an aperture and a laser flow cell. Laser eye sensors count the number of the cells passing through the aperture and can also identify them. This is flow cytometry. Two main sensors used are light detectors and electrical impedance. The instruments identify the type of blood cell by analyzing data about the size and aspects of light as they pass through the cells (called front and side scatter). The counts are reported.

In patients with very low platelet count, the counts are rechecked using manual method. In manual method, whole blood is diluted with 1% ammonium oxalate solution. The isotonic balance of the diluents is such that all the erythrocytes are destroyed while platelets and leucocytes remain intact. The standard dilution for platelet is 1:100. The dilution is prepared using leucocyte/platelet unopette system. The dilution is mixed well and incubated to permit the lysis of the erythrocytes following incubation period. The dilution is mounted on a hemocytometer chamber under the microscope. The cells are allowed to settle and then are counted in a specific area of hemocytometer under the microscope. The number of platelet is calculated per micro liter.

Platelet values.

Normal	1.5 to 4 Lakhs /mm ³
Thrombocytopenia	<1.5 lakhs/mm ³ .
Critical count	<50,000/mm ³ .

The data thus collected were analyzed using appropriate statistical methods. The mean and standard deviations were completed. The statistical test used for analysis was

1. The Pearsons correlation coefficient, which is expressed as r.
2. Student chi square test is expressed as P. A value of p<0.05 has been considered to be statistically significant.

3.DATA ANALYSIS AND RESULTS

In the present study, fetal and maternal outcome was compared between control group women and in women with pre eclampsia and eclampsia associated with thrombocytopenia. Further, the association of thrombocytopenia with fetal and maternal outcome was studied. Frequency distribution with class intervals was carried out for selected variables. Chi-square test of association was carried out to study the association of thrombocytopenia with the maternal and fetal outcome. The statistical analysis was carried out using the statistical packages for social sciences (SPSS-21). Suitable graphical illustrations were also made.

SUMMARY OF RESULTS

The common age range of study women was between 24-29 years. (Graph 1)

Fig.1



Fig.2

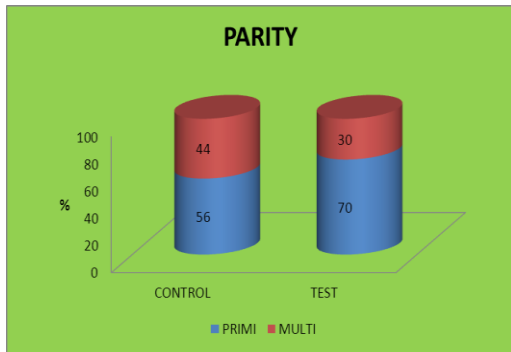


Fig.3



Fig.4

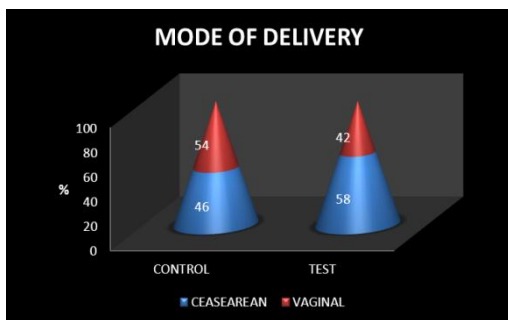


Fig.5

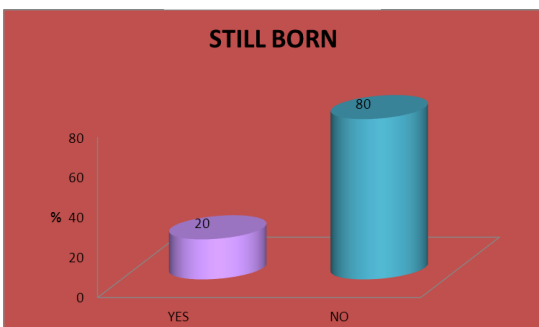


Fig.6

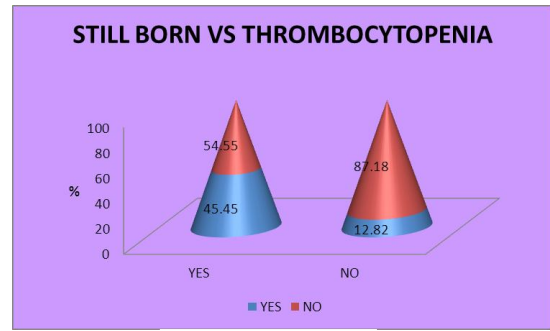
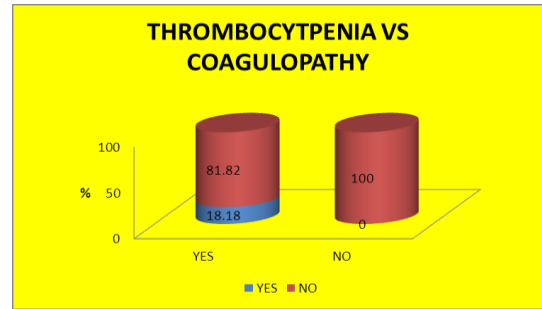


Fig.7



The majority of women were primigravidas (Graph 2) The common duration of pregnancy in control group was greater than or equal to 37 completed weeks, whereas the duration of pregnancy in test group was between 34 to 37 weeks (44%) (Graph 3) Thus the test group had significantly lesser duration of pregnancy

The common gestational age at presentation for test group women was between 28 – 32 weeks (28%) , 33 –37 weeks (26%) , 24 –28 weeks (22%) , and 38- 40 weeks (22%).

56% of women had eclampsia and 44% of women had pre eclampsia in test group

Mode of delivery was by caesarean section was 58% in test group and 26% in control group , vaginal delivery was 42% in test group and 74% in control group. The 'p' value was significant for chi-square test. (Graph 4)

22% of women in test group had thrombocytopenia.

4% of women in test group had coagulopathy.

The occurrence of coagulopathy was significantly higher in women with thrombocytopenia in test group. (Graph 7)

20% of women in test group had still born infants.

There was significantly higher occurrence of still born infants in women with thrombocytopenia in test group. (Graph 5,6)

There was no significant association observed between preterm and thrombocytopenia.

The mean birth weight of control group was 2.85 whereas it was 2.15 for test group. The birth weight was significantly lower in test group when compared to controls.

Graph 1

4.DISCUSSION

The mean age of pregnant women in our study was between 24-29 years. There was no statistically significant correlation between age and thrombocytopenia in our study or in other studies.

Majority of the women in our test group were primigravidas and presented with thrombocytopenia , a fact studied and recorded by other authors (Delmis . J et al)

It is observed that the mean duration of pregnancy was significantly higher in control group, which means most of them were full term deliveries , whereas the duration of pregnancy was reduced in test group in patients with thrombocytopenia . Thereby suggesting early delivery as prompt treatment of the disease and preventing complications . A fact recorded earlier by JK Vrunda et al.

In our study there was higher operative intervention in test group as when compared to the control group.in patients with thrombocytopenia due to deteriorating maternal condition.

The occurrence of coagulopathy associated with thrombocytopenia was significantly higher in test group. A fact recorded by other authors (M P Fitzgerald) Association of Thrombocytopenia With Coagulopathy

There was a higher incidence of still born infants in women with thrombocytopenia in the test group suggesting a poor neonatal outcome in cases with maternal thrombocytopenia. A fact recorded by other authors (Carl H Backers et al).

The average birth weight of patients in control group was 2.85 whereas in test group it was 2.15. Thus the birth weight was significantly lower in the test group due to placental factors in pre eclampsia and associated thrombocytopenia. A fact recorded by other authors (K J Zook et al).

5.CONCLUSION

Thus the estimation of platelet counts in eclampsia and pre eclampsia has a higher prognostic value of detecting complications much earlier and predicting the outcome of the pregnancy

AGE DISTRIBUTION

Age (in years)	Control		Test	
	Number	Percentage	Number	Percentage
18-23	18	36	20	40
24-29	26	52	22	44
30-35	5	10	7	14
>35	1	2	1	2
Total	50	100	50	100

Age	Mean	Standard deviation (S.D.)
Control group	25.62	4.54
Test group	25.38	4.61

Majority of the women in our test group were primigravidas and presented with thrombocytopenia , a fact studied and recorded by other authors (Delmis . J et al)

PARITY DISTRIBUTION

Parity	Control		Test	
	Number	Percentage	Number	Percentage
Primi	28	56	35	70
Multi	22	44	15	30
Total	50	100	50	100

It is observed that the mean duration of pregnancy was significantly higher in control group, which means most of them were full term deliveries , whereas the duration of pregnancy was reduced in test group in patients with thrombocytopenia . Thereby suggesting early delivery as prompt treatment of the disease and preventing complications . A fact recorded earlier by JK Vrunda et al.

Association between test & control groups

	Value	Significant ('p' value)
Chi-square test	4.804	0.028

In our study there was higher operative intervention in test group as when compared to the control group.in patients with thrombocytopenia due to deteriorating maternal condition.

Mode Of Delivery

Mode of Delivery	Control		Test	
	Number	Percentage	Number	Percentage
Caesarean	13	26	29	58
Vaginal	37	74	21	42
Total	50	100	50	100

	Value	Significant ('p' value)
Chi-square test	4.038	0.045

The occurrence of coagulopathy associated with thrombocytopenia was significantly higher in test group. A fact recorded by other authors (M P Fitzgerald)

Association of Thrombocytopenia With Coagulopathy

	Thrombocytopenia		Coagulopathy	
	Number	Percentage	Number	Percentage
Yes	11	22	2	4
No	39	78	48	96
Total	50	100	50	100

Cross tabulation

Coagulopathy	Thrombocytopenia				Total	
	Yes		No			
	Number	Percentage	Number	Percentage	Number	Percentage
Yes	2	18.18	0	0	2	4
No	9	81.82	39	100	48	96
Total	11	100	39	100	50	100

	Value	Significant ('p' value)
Chi-square test	7.386	0.007

There was a higher incidence of still born infants in women with thrombocytopenia in the test group suggesting a poor neonatal outcome in cases with maternal thrombocytopenia. A fact recorded by other authors (Carl H Backers et al).

Cross tabulation

Still born	Number	Percentage
Yes	10	20
No	40	80
Total	50	100

Fig.5

Still born	Thrombocytopenia				Total	
	Yes		No			
	Number	Percentage	Number	Percentage	Number	Percentage
Yes	5	45.45	5	12.82	10	20
No	6	54.55	34	87.18	40	80
Total	11	100	39	100	50	100

	Value	Significant ('p' value)
Chi-square test	5.711	0.017

Association of Thrombocytopenia with still born

Birth weight	Mean	Standard deviation
Control group	2.85	0.312
Test group	2.15	0.751

	't' Value	Significant ('p' value)
Independent sample test	6.179	0.001

the severity of the disease, lower the count higher is the maternal/fetal morbidity and mortality.

Estimation of platelet count is simpler, quicker, cost effective, which can be performed in a small setup in clinical practice during every antenatal visit with easy follow up.

Once thrombocytopenia is detected in case of pre eclampsia or eclampsia it has to be predicted as a sign of worsening disease. Immediate hospitalization, investigations to rule out coagulopathy and HELLP syndrome should be carried out. In addition other tests like renal function test, liver function tests, serum uric acid concentrations, 24 urinary excretion of proteins should be done to detect other system involvement, thereby improving maternal/fetal outcome.

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