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PREGNANCY INDUCED HYPERTENSION;

ASSESSMENT OF PROGNOSTIC VALUE OF PLATELET COUNT IN WOMEN WITH VARYING DEGREE

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ABSTRACT... Objective: To assess the early detection of thrombocytopenia in women presenting with varying degree of pregnancy induced hypertension (PIH). **Study Design:** A case control study. **Place of Study:** Hematology laboratory Isra University Hospital Hyderabad. **Duration of Study:** From July 2009 to December 2010. **Materials and Methods:** Total 130 pregnant women were included in this study. The subjects were divided into three groups as Group 1 with pre-eclampsia, Group 2 with eclampsia and Group 3 with normotensive pregnant women as control group. The Group 1 was further divided into two sub groups such as Sub-group 1a with mild preeclampsia and Sub-group 2b with severe pre-eclampsia. **Results:** Anticoagulated whole blood samples (5cc) from all subjects were analyzed for the detection of thrombocytopenia for the possible involvement of pregnancy induced hypertension. It was noted that out of total subjects, 33(25.39%) had mild pre-eclampsia, 17(13.07%) had severe pre-eclampsia, 15(11.54%) had eclampsia and 65 (50.0%) were normotensive pregnant women. Based on the comparative findings, the results showed significant differences between group 3 and group 1a (p-value 0.001), group 3 and group 1b (p-value 0.001), group 2 and group 3 also showed same results (p-value 0.001) but the subjects of group 1a and 1b when compared, showed non-significant findings (p value 0.955). **Conclusion:** The results suggested that early detection of platelet count provide significant role for the assessment of severity of disease in women with pregnancy induced hypertension when compared with normotensive pregnant women.

Key words: Platelet count, Normotensive pregnant women, Pregnancy-induced hypertension, Prognosis.

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INTRODUCTION

Pregnancy induced hypertension (PIH) is one of the common outcomes with unknown etiology that causes the most maternal and perinatal morbidity and mortality[1].Hypertensive disorders of pregnancy were ranked as the third most important cause of maternal mortality throughout in Pakistan[2]. During the past 20 years, the incidence of hypertensive disorders during pregnancy has increased, probably partly caused by increasing obesity and partly by maternal age[3]. Globally, pre-eclampsia and eclampsia account for 10%–15% of maternal deaths[4]. Maternal Mortality is extremely high in Pakistan where1:89 women dies because of maternal causes with pre-eclampsia and eclampsia[5].

Pre-eclampsia is a multiorgan disease process of unknown etiology characterized by increased blood pressure and proteinuria after 20 weeks of gestation[6]. Pregnancy induced hypertension is a major cause of maternal mortality and morbidity in Pakistan and its incidence and related mortality are high due to the lack of adequate antenatal care[7]. Women diagnosed with pre-eclampsia or eclampsia are at increased risk of future cardiovascular or cerebrovascular accidents and the risk becomes almost double when compared

to unaffected women[8].

Hematological abnormalities such as thrombocytopenia and decrease in some plasma clotting factors may develop in pre-eclamptic women[9]. The degree of thrombocytopenia increases with severity of disease and the incidence of thrombocytopenia depend on the severity of the disease process. Lower the platelet count, greater are the maternal and fetal morbidity and mortality[10]. Overt thrombocytopenia caused by platelet count less than 1 lac/μl indicates the severity of disease process where as in most cases the hypertensive disorder especially in pregnancy is elicited because of continuous decrease in platelets count[10]. Therefore present study is carried out to provide the information and suggestion to the patient and clinician for the early detection of thrombocytopenia in women presenting with varying degree of pregnancy induced hypertension (PIH) in preventing the life threatening complications like HELLP syndrome.

MATERIALS AND METHODS

Anticoagulated whole blood samples (05cc) were collected from total 130 pregnant women attended in the outpatient department of Isra University Hospital, Hyderabad. The blood samples from all subjects were analyzed by automated hematological analyzer (Nihon kohden, MEK 6318) by volumetric impedance technique for the detection of thrombocytopenia in women with pregnancy-induced hypertension.

All the subjects were divided into these groups according to the severity of the disease.

I. Women having diastolic pressure less than 100mm.Hg and proteinuria more than 300mg/24hrs or significantly increase from base line were considered as a mild preeclampsia and kept in sub-group 1a.

II. Women having high blood pressure i.e., systolic pressure greater then 160mm.Hg and diastolic pressure 110mm.Hg on two occasions atleast 6 hrs before during bed rest. Also after biochemical analysis when proteinuria was greater than 5gm/24 hrs in urine sample and any symptoms associated with cerebral or visual disturbances, epigastric or right upper quadrant pain, restriction of fetal growth, impaired liver function, pulmonary edema, oliguria less than 500ml/24hrs and thrombocytopenia were considered as “sever pre-eclamptic women” and were kept in the sub-group 1b.

III. Women affected with convulsions and having the signs of pre-eclampsia during pregnancy or within seven days after delivery and are not caused by epilepsy or any other convulsive disorders were treated as “eclamptic women” and taken in group 2.

IV. Those women who were normotensive were considered as control group and kept in group 3.

All the data obtained after experimental work were analyzed statistically by SPSS version16, Chi-square test and student T-test to compare the findings between the affected and control group. Statistically P-value <0.05 was considered significant.

RESULTS

The total number of gynaecological admission particularly pregnancy induced hypertensive (PIH) pregnant women during the study period was 130, among them 33(25.39%) were presented with mild pre-eclampsia (Table-I) and kept in sub group 1a. The mean age of all the women in this group were 25.5+3.83 having age limits between 18-23 years (Table-II).

Patient’s distribution	Frequency	%age
Group 1a (Mild PE)	33	25.39
Group 1b (Severe PE)	17	13.07
Group 2 (Eclampsia)	15	11.54
Group 3 (Controls)	65	50.00

Table-I. Frequency and percent distribution in diseased persons in comparison to control subjects

The hematological analysis showed that the platelets count found was 162±67.8 x 10^3/μl with

range of 47-278 x 10^3/ μl (Table-IIIA). It is also found that 17 women (13.07%) during presentation were having severe pre-eclampsia (Table-I) and kept in sub-group 1b. The mean age of these patients were 28.58±3.75 with range of 23-36 years (Table-II). The platelets count of these severe pre-eclampsic women was found to be 163.0±74.2 x 10^3/μl with range of 67-251X10^3/ μl (Table-IIIA).

Groups	Mean Age ± S.D	Range
Group 1a (Mild PE)	25.5±3.83	18-32
Group 1b (Severe PE)	28.58±3.75	23-36
Group 2 (Eclampsia)	33.80±4.88	25-40
Group 3 (Controls)	28.24±5.16	18-39

Table-II. Age distribution in relation to diseased and control persons

Similarly, 15(11.54%) out of total women with eclampsia (Table I) and were kept in group 2. The mean age of the women in this group was 33.80±4.88 having range of 25-40 years (Table II). During hematological analysis, the platelets count was found to be 171±65.6 x 10^3/ μl with range of 103-278 x 10^3/ μl (Table 3A). The remaining women were considered as normotensive pregnant women (Table I) and considered as control in group 3. The mean age of these normotensive subjects were 28.24±5.16 with limit of 18-39 years (Table II). The mean platelets count was 247.0±75.0 x 10^3/ μl with range of 150-456 x 10^3/ μl (Table- IIIA).

Comparing the data statistically between the different groups, it has been observed that when the results of sub-group 1a was compared with the subjects of group 3, it was found statistically significant with P-value 0.001 and when sub-group 1b was compared with group 3 also showed significant results with p-value 0.001. Also if the findings of group 2 was compared with group 3, the same significant findings were noticed, p value 0.001. Similarly when sub-group 1a was compared with the subjects present in sub-group 1b, the findings were statistically non-significant having p-value 0.955 (Table-IIIB).

Statistical Analysis		
Comparison groups	**p-value**	
1a Vs 3	0.001	Significant
1b Vs 3	0.001	Significant
2 Vs 3	0.001	Significant
1a Vs 1b	0.955	Non-significant

Table-IIIB. Statistical analysis showing the comparative finding between different groups of patients

DISCUSSION

Pre-eclampsia (PE) remains to be one of the primary cause of maternal and fetal morbidity and mortality all over the world[11]. This is the reason that about 10-12% of pregnant women in our population suffered from hypertensive disorder. Severe hypertension in a pregnant woman is a multisystem disease and a threat to the well- being of both mother and child[12]. Most studies showed that, this increased risk mainly occurs among women with severe chronic hypertension in those who develop superimposed preeclampsia[13].

Regarding platelet count which is the main tool of early detection of thrombocytopenia in women with pregnancy-induced hypertension, it has been observed that platelet count was significantly found lower in PIH women when compared with normal pregnant women. This significantly reduced platelet count in preeclampsia has also been reported by other researchers.

Platelet Count (/cmm)	Group 1		Group 2	Group 3
	1a	1b		
Range	47-278x10^3	67-251x10^3	103-278x10^3	150-456x10^3
Mean ± S.D	162x10^3 ± 67.8 x10^3	163x10^3 ± 74.2 x10^3	171x10^3 ± 65.6 x10^3	247x10^3 ± 75.0 x10^3

Table-IIIA. Statistical analysis showing platelets count in different groups of persons

A study conducted in India showed that platelet count in pre-eclampsic group and eclampsic group showed significantly decreased platelet count when compared with the normotensive control group[14]. Another study conducted at Turkey also showed lower platelet count in severe pre-eclampsic women ($p<0.05$)[15].

Similarly when the value of platelet count between the control and study groups were compared significant reduction in platelet count was observed, this shows that most of the women with eclampsia have very low platelet count as compared to mild and severe preeclampsia[16]. It has also been reported that the mean value of platelet counts were significantly decreased in the pre-eclamptic patients than normotensive pregnant women[17]. The present study also showed that there is no statistically significant difference found between platelet count in mild and severe preeclampsia, thus confirming with the result of others researchersl[18].

Some other researchers also reported that during pregnancy, the commonest cause of thrombocytopenia are gestational thrombocytopenia, preeclampsia and eclampsia[19,20]. It has been observed and reported that about 6.6-11.6% of pregnancies results in thrombocytopenia[21]. The hypothesis regarding pathogenesis of thrombocytopenia in preeclampsia is still not clear, but in this connection some researcher reported that thrombocytopenia is caused due to the involvement of endothelial damage and peripheral consumption[22]. It is also found that in pregnancies complicated with preeclampsia, the life span of platelet is reduced from 3 to 5 days and the altered platelet membrane accelerates its aggregation and destruction[23]. The findings are almost in line with the present results and investigation.

CONCLUSIONS

The results of this study conclude that a better control on systolic and diastolic pressure is needed in women with pregnancy-induced hypertension. Also platelets count was performed and found that a significant decrease in platelet number was observed in women with pregnancy induced hypertension when compared with normotensive pregnant women. This shows that there is a direct relationship of platelet count and severity of preeclampsia and eclampsia. Therefore early detection of platelet count can be useful and beneficial as screening test for the assessment of severity of preeclampsia and eclampsia as it is rapid and cheaper technique.

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