Original Research Paper

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A Randomised study on Aspirin and calcium in preventing preeclampsia and its complications

Gynaecology

KEYWORDS: Aspirin,calcium, preeclampsia

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ABSTRACT

BACKGROUND: compared the efficacy of aspirin 75mg and calcium 1-2gm from 16 wks in preventing preeclampsia and its complications METHODOLOGY 100 patients in the study were randomly allocated to groups of 50 each group A and group B. patients are taken into study such that they are at risk of developing preeclampsia. Patients in group A- received aspirin 75mg and calcium 1-2gm from 16 wks gestation daily. group B did not receive any aspirin and calcium.pateints were monitored at each visit for development of preeclampsia, admitted at followed till delivery and postpartum for development of preeclampsia and its complications RESULTS: incidence of preeclampsia and its complications, both maternal and fetal, were lower in the study group than that in control group, which was statistically insignificant CONCLUSION: Aspirin and calcium when supplemented from 16 wks to women at risk of developing preeclampsia,can not prevent the disease and its complications significantly

INTRODUCTION-

Hypertensive disorders represent the most common medical complication of pregnancy with reported incidence of 6-8% and accounts for 15% of maternal mortality1. Of hypertensive disorders, Preeclampsia is a serious systemic condition affecting 3–5% of pregnancies and accounts for more than 50,000 maternal deaths annually worldwide2. preeclampsia is gestational hypertension with proteinuria, appearance of proteinuria remains diagnostic criteria3. The disorder is probably multifactorial, although most cases of preeclampsia are characterized by abnormal maternal uterine vascular remodeling by fetal derived placental trophoblast cells4 . There has been a move to improve prediction rates of women who will develop preeclampsia and if deemed high risk, offer some form of prophylaxis or intervention (NICE, 2010).Preeclampsia is associated with reduced intravascular production of prostacyclin and excessive production of thromboxane A2. Administration of anti-platelet agents to women at risk of preeclampsia leads to a 17% reduction in the risk of developing this condition & significantly reduce maternal mortality and morbidity in addition to rates of perinatal mortality6. World Health Organization (WHO) advised calcium supplements at a dosage of 1.5–2 g per day from 20 weeks of gestation in populations where calcium intake is low to prevent the onset of preeclampsia, especially amongst women that are at high-risk of preeclampsia.

METHODS-

After obtaining institutional ethical committee clearance,study was undertaken in 100 patients who are at risk of developing preeclampsia.INCLUSION CRITERIA-Hypertensive disease in previous pregnancy, Chronic kidney disease, Elderly primigravida, Age >40 years, Auto immune disease e.g. anti-phospholipid syndrome, Diabetes mellitus, Chronic hypertension, Multiple pregnancy, BMI >35 kg/m2 at booking, Thrombophilias,Conception on ART.EXCLUSION CRITERIA- allergic to any ingredient in Aspirin, bleeding problems such as hemophilia, Von Willebrand disease, or low blood platelets, h/o severe peptic ulcer, Not willing to participate in the study, Patients who were diagnosed with other causes of convulsions in pregnancy like cerebral malaria and epilepsy.

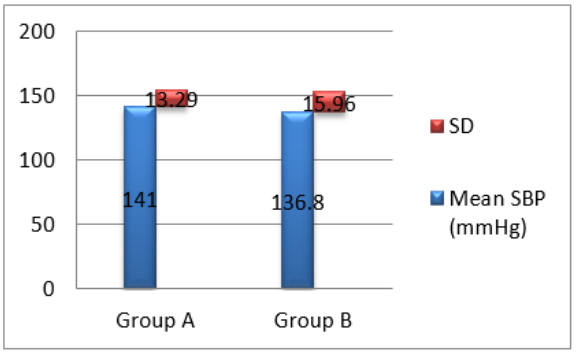
100 participants who fulfilled the selection criteria after taking informed consent were categorised in to two groups by block randomisation.Group A- Control group, 50 controls, Aspirin not given, Calcium not given.Group B- Study group, 50 cases. Received 75mg of aspirin in single dose. Received calcium 1-2 gms in two divided doses .Patients were called for antenatal visits weekly or 2 weekly in 2nd trimester and following were assessed at each visit.- History taking with emphasis on symptoms of severe preeclampsia and imminent signs, General examination-weight recording-BP recording,obstetric examination,-per abdomen-assess growth of fetus, liquor quantity, fetal heart rate, side effects of drugs,examination of urine for albumin. Aspirin stopped at 32-34 wks.Inpatient admission was done when more than 36 wks, once BP was elevated severly ,or urine albumin is 2+,-imminent signs of eclampsia, IUGR fetus.Patients were monitored accordingly ,as per their BP readings and planned for mode of delivery depending on maternal condition and obstetric indications. Maternal and fetal outcome measured

RESULTS

Table 1 on SBP and DBP

	N	Mean SBP (mm Hg)	SD	Mean DBP (mm Hg)	SD
Group A	50	136.00	15.96	86.80	10.96
Group B	50	140.80	13.28	89.40	9.13
P value		0.030 NS		0.020* S	

The patients in group A had lesser SBP and DBP on an average when compared to those of group B. The difference in mean SBP and DBPs was statistically significant



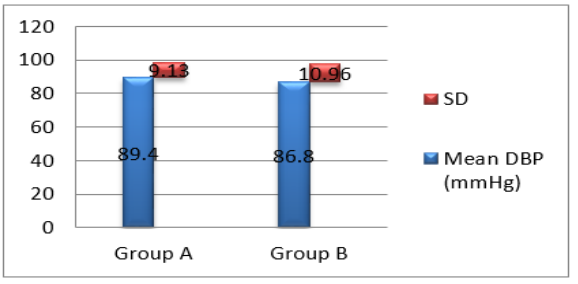


Table 2 on Incidence of preeclampsia

Preeclampsia	Group A	Group B
YES	24	28
NO	26	22

Total number of preeclamptic women in the study is 52.which are 24 of group A and 28 of group B. Incidence of preeclampsia is comparable in both groupsp is 0.584 which is statistically insignificant

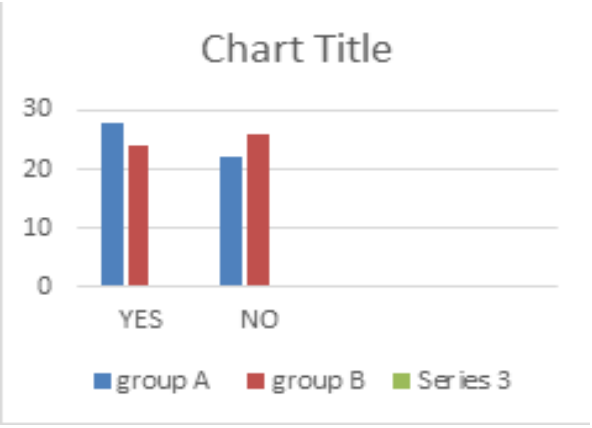


Table – 3: Maternal Complications

Maternal Complications	Group A	Group B	Grand Total	p value (Fisher's
Eclampsia	2	4	6	0.677
HELLP	0	2	2	1.000
Oligohydromnios	3	5	8	0.715
APH	2	3	5	1.000
Death	0	0	0	--
ARF	0	0	0	--
Shock, TICU admission	0	0	0	--
PPH	2	3	5	1.000

Of 26 women with complications.17 from the control group and 9 from the study group .p value is insignificant with any individual complication.so groups are comparable

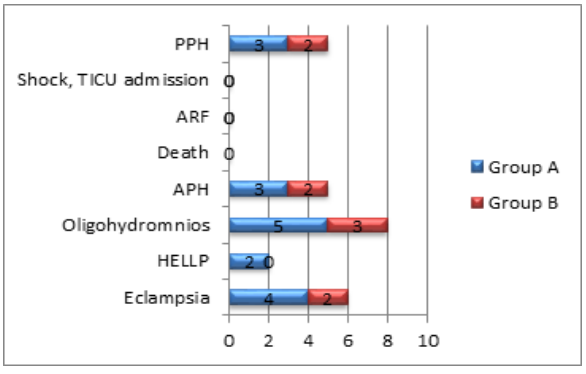


Table – 4: Fetal Complications

Fetal Complications	Group A	Group B	Total	p value (Fisher's Test)
Death	0	0	0	-
IUGR/LBW/SA	8	14	22	0.159
Preterm labor	10	14	24	0.363
Asphyxia	0	0	0	-

28 pregnant women had fetal complications in group B, whereas it is 18 in group A, 22 neonates were with IUGR .24 of preeclamptic women delivered preterm babies

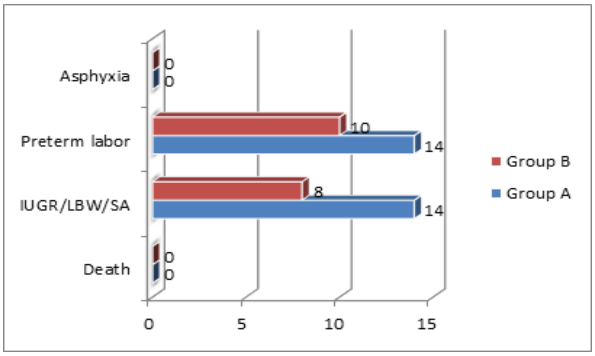
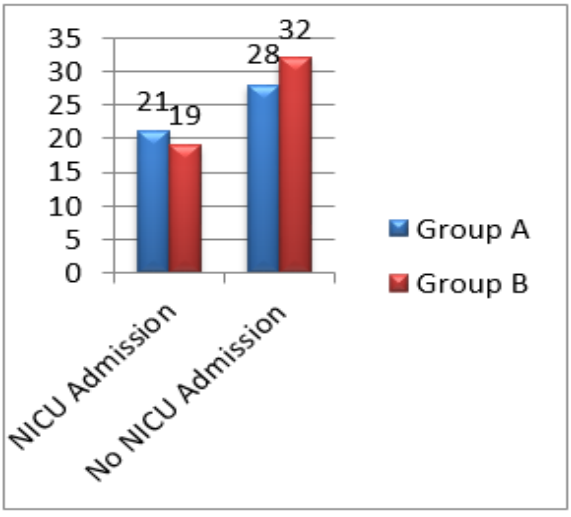


Table – 5: NICU admission rates (not including IUDs and stillbirths)

NICU admission	Group A		Group B		Total
	N	%	N	%	
No	31	62.75	29	57.14	60
Yes	19	37.25	21	42.86	40
Total	50	100.00%	50	100.00%	100

(Chi square = 0.242, DoF=1, p = 0.622)

19 of neonates in group B required NICU admissions whereas only 37.25% in group A required it. But the difference was not significant



DISCUSSION

The patients in group B had lesser SBP and DBP on an average when compared to those of group A, ie the mean SBP readings in group A-141.0 and in the group B was 136.8 and the (p value is 0.030) which was statistically significant. the mean DBP readings in group A-89.4mmhg and in the group B is 86.8mmhg and the p value is 0.020 which is statistically significant and the aspirin and calcium was effective in reducing the systolic and diastolic blood pressure in the study group. According to kirtan manoj vyas et al6 reduction of mean systolic BP and mean diastolic BP during antepartum and intrapartum in the study group of aspirin. The study by Kumar and Sharma 2009 indicated reduction of mean DBP.

Total number of preeclamptic women in the study is 52.which are 28 of group A and 24 of group B. p is 0.584 which is statistically insignificant ie aspirin and calcium decreased incidence of preeclampsia compared to control group but difference is insignificant,My result was compared toCristina Rossia et al72011conducted a systemic review and meta-analysis on Prevention of preeclampsia with low-dose aspirin or vitamins C and

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E in women at high or low risk women. Fifteen studies were pooled. Low dose aspirin did not decrease the incidence of preeclampsia in high-risk and low-risk women.

A total of 36 pregnant women in the sample developed complication, 4 from group A , 2 from group B complicated to Eclampsia. 3 from group A and 2 from group B developed HELLP syndrome. Where as 5 from group A and 3 from group B developed oliohyromnios. 3 from group A and 2 from group B were complicated with abruption placenta .3 from group A and 2 from group B landed up in PPH. There was no maternal mortality in the study group and mortality of 1 in the control group. According to Mackay et al 2001 Women who develop preeclampsia or eclampsia during pregnancy are at an increased risk of abruptio placentae, acute renal failure, cerebrovascular and cardiovascular complications, and maternal death. In my study 4 of the control group and 2 of the study group which were supplemented with aspirin and calcium were complicated with eclampsia . P value is 0.677 which is not significant and both groups are comparable. According to Liu et al. the incidence of eclampsia in cases of severe preeclampsia was 9.34 % . 3 of preeclamptic women in the control and 2 of preeclamptic women in the study group which were supplemented with aspirin and calcium were complicated with HELLP syndrome, and p value is 1.000 which is insignificant and both groups are comparable Yucesoy et al in their study reported 5 cases of 225 cases of hypertensive disorders in pregnancy were diagnosed as HELLP syndrome, two were severe preeclampsia and three were eclamptic. 3 of preeclamptic women in the control and 2 of preeclamptic women in the study group which were supplemented with aspirin and calcium were complicated with abruption placenta and the p value is 1, where it is insignificant and both groups are comparable.Murphy and Stirrat (15 % had abruption).Placental abruption and coagulopathy were commonest complications of our study; in the study by Agida et al, acute renal failure was the commonest maternal complication. 3 of preeclamptic women in the control and 2 of preeclamptic women in the study group which were supplemented with aspirin and calcium were complicated with postpartum haemorrhage and p value is 1.000 which is insignificant and both groups are comparable.5 of preeclamptic women in the control and 3 of preeclamptic women in the study group which were supplemented with aspirin and calcium were complicated with oligohydromnios. Out of 8, 3 of them presented with severe oligohydromnios ,where emergency cesarean section is needed. P value is 0.7 which is insignificant and both groups are comparable. There was no maternal mortality in the study group. Similar to our study Van Bogaert Alvarez Navascues , Jantasing reported very low or no maternal mortality. It might be due to equipped intensive care unit and aggressive rapid interventions applied for severe preeclamptic patients. The results of my study were comparable with studies of Duley et al8 200, Antiplatelet agents, in this review largely low-dose aspirin, have small-moderate benefits when used for prevention of pre-eclampsia and its complications.

28 pregnant women had fetal complications in group A, whereas it is 18 in group B, 22 neonates were with IUGR .24 of preeclamptic women delivered preterm babies. In my study 14 among preeclamptic patients in the control group and 10 among preeclamptic patients in the study group landed up in preterm delivery and p value is 0.363 which is insignificant and both groups are comparable.14 pregnant patients among controls delivered IUGR /LBW/SGA babies where as 8 pregnant patients of study group delivered IUGR/LBW babies. P value is 0.159 which is insignificant. It is important to note that while reduced birth size is associated with severe preeclampsia, it has not been as well described in pregnancies complicated by mild preeclampsia. Odegård et al showed pregnancies complicated by severe preeclampsia had infant birth weights 12% lower than expected, while pregnancies with mild preeclampsia showed no difference in weight gain from expected norms . My study was comparable to the study of Mehnaz Jabeen et al9 2011, with aspirin, found an insignificant decrease in IUGR, stillbirth and perinatal mortality. For calcium supplementation, there was a borderline significant reduction in stillbirths and LBW/IUGR.According to Roberge et al10 2013 prophylactic use of low-dose aspirin initiated at or before the 16th week of pregnancy is associated with insignificant reduction in the prevalence of severe preeclampsia, FGR and preterm birth, all placenta-related complications of pregnancy 42.86% of neonates in group B required NICU admissions whereas only 37.25% in group A required it and the p vaue is 0.622 which is statistically not significant and both groups are comparable. But comparatively NICU admissions were lower in the study group.

CONCLUSION

Recommendation of aspirin and calcium from 16 wks of gestation in women at high risk of developing hypertensive disorders in pregnancy, did not prevent incidence of preeclampsia, and its complicationssignificantly

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