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Original Research Article

Efficacy of low dose aspirin on maternal and foetal outcome in preeclampsia

Sopanrao Malharrao Togarikar*

Department of Obstetrics and Gynecology, MNR Medical College and Hospital, Sangareddy, Telangana, India

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***Correspondence:**
Dr. Sopanrao Malharrao Togarikar,
E-mail: dr.togarikar@gmai.com

ABSTRACT

Background: Low dose aspirin administration can reduce vasoconstriction and decreases thrombosis of the vessels related to placenta, thereby increases blood flow and protects against to pregnancy related complication like preeclampsia, IUGR or FGR. This study was undertaken to assess the efficacy of low dose aspirin (75 mg/day) on foetal and maternal outcome in preeclampsia patients.
Methods: A total 100 preeclampsia patients were elected and were divided in to two groups i.e. control group includes age and parity matched preeclampsia cases under regular conventional treatment without aspirin administration and cases group receiving conventional treatment with aspirin 75 mg/ day after breakfast from recruitment upto one week before pregnancy.
Results: There was a significant decrease in caesarean sections in cases (22%) and control groups (30%). Blood pressure, proteinuria was significantly reduced and platelets count was increased at time of presentation to after delivery in cases and controls. There was a less intra uterine deaths (8% in cases and 14% in controls) and neonatal deaths (2% in cases and 6% in controls) in cases than in controls. Neonatal haemorrhage was not accounted in both groups.
Conclusions: Beginning of low dose aspirin administration in the early second trimester of pregnancy may reduce incidence of adverse health outcomes like IUGR, preeclampsia and preterm birth.

Keywords: Aspirin, Blood pressure, Platelet count, Preeclampsia, Proteinuria

INTRODUCTION

Pre-eclampsia remains a major contributor to maternal and perinatal mortality and morbidity in 2-8% of pregnancies among world-wide. It is recognized clinically by onset of hypertension from 20 weeks of gestation with pulmonary oedema, proteinuria, renal and hematologic involvements.[1-3]

The incidence of preeclampsia is 3.85% in Europe, 4% in Africa, and <1% in Asian countries including India.[4] Low dose aspirin (60-150mg per day) can reduce the risk of preeclampsia, preterm birth and IUGR by 24%, 14% and 20% respectively.[5] In preeclampsia, aspirin administration depends on platelets and prostaglandins involvement in its pathogenesis.

Low dose aspirin therapy inhibits the production of thromboxane (vasoconstrictor) but not prostacyclin (vasodilator) in uteroplacental circulation. Thus, it reduces the thrombosis of placental vessels and improves placental circulation.

Haapsamo et al. observed that low-dose aspirin could lead to an improvement of uterine artery blood flow that is related to the transformation of uterine spiral arteries.[6,7]

The objectives of present study were to evaluate the role of low dose aspirin (75 mg per day) in improving the fetomaternal outcome in terms of blood pressure, proteinuria, oedema, fetomaternal mortality and morbidity in preeclampsia patients.

METHODS

The present study was conducted in Department of Obstetrics and gynaecology, MNR Medical College and Hospital, Sangareddy during July 2015 to May 2017. A total 100 preeclampsia patients were selected from wards and outpatient department. All patients were in between 10-34 weeks of gestation. Patient selection criteria was based on the following, systolic blood pressure >140 mmHg and diastolic blood pressure <90 mmHg, on levels of proteinuria and oedema. Women with history of severe pre-eclampsia or recurrent pre-eclampsia during a single previous pregnancy were also included and women with chronic hypertension, Allergic reaction to salicylates, low cardiac reserve, congestive heart failure, diabetes, acid peptic disease and duodenal ulcer or bleeding diathesis were excluded from the study. Total participants were divided in to two group i.e. control group includes age and parity matched preeclampsia cases under regular conventional treatment but without aspirin administration and cases group receiving conventional treatment as well aspirin 75 mg after breakfast from recruitment upto one week before pregnancy.

Examination of the patient

General examination with special attention to oedema, blood pressure, pallor and weight was done. Brief systemic examination of CVD, respiratory diseases was done. Obstetrical and per vaginal examination was done. Various hematological, biochemical i.e. haemoglobin percentage, ESR, blood sugar, blood urine, serum cholesterol, serum uric acid, serum creatinine and platelet count was done. Urine examination was performed for albuminuria. Total protein measured by biurate method. A comparison was made between the aspirin plus conventional therapy treated group and conventional therapy treated group in pre-eclampsia.

RESULTS

A total one hundred preeclampsia patients were recruited and all the patients were divided equally in to two groups.

Table 1: Distribution of patients according to age.

Age groups in years	Cases		Controls	
	No.	%	No.	%
Below 20	3	6	4	8
21-25	12	24	10	20
26-30	24	48	27	54
31-35	11	22	9	18
Total	50	100	50	100

Maximum number of patients were between age group 26-30 years in cases (48%) and controls group (54%) (Table 1). In both groups, maximum number of patients were primigravida (Figure 1).

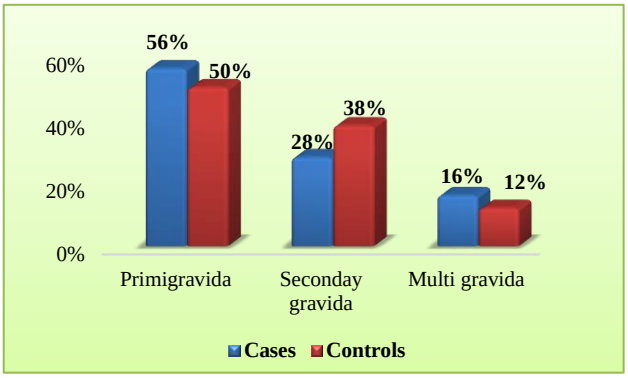

Figure 1: Distribution of cases according to gravidity.

Majority patients were nulliparous in both groups (48% in cases and 56% in controls). In view of past pregnancy outcome, intrauterine death occurred in 18% and 8% in cases and controls respectively.

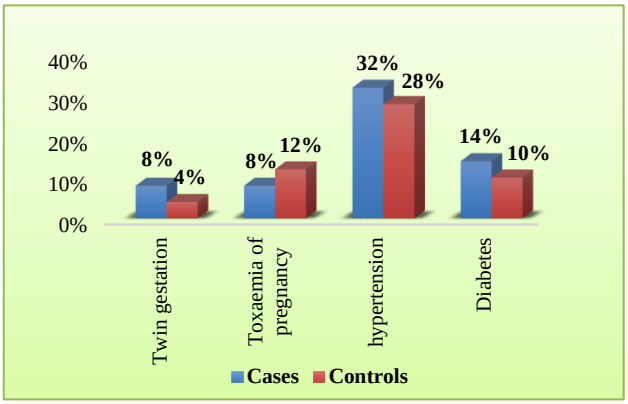

Figure 2: obstetrical characteristics of patients.

Neonatal death occurred in 8 cases (16%) and 2 controls (4%). Majority patients and controls complained swelling over feet at the time of clinical presentation. Twin gestation was present in 8% cases and 4% controls. Hypertension was present in 32% cases and 28% controls (Figure 2).

Table 2: Mean changes in systolic blood pressure and diastolic blood pressure in cases and control groups.

Characteristics	B.P mm of HG	Cases	Controls
		Mean±SD	Mean±SD
At Presentation	SBP	158.4±10.85	154.3±12.75
	DBP	100.2±10.05	100.47±9.20
At delivery	SBP	137.3±9.98	141.3±12.14
	DBP	91.6±10.16	92.2±9.05
After delivery	SBP	128.5 ± 7.54	134.4±9.64
	DBP	83.1±9.76	84.6±9.17

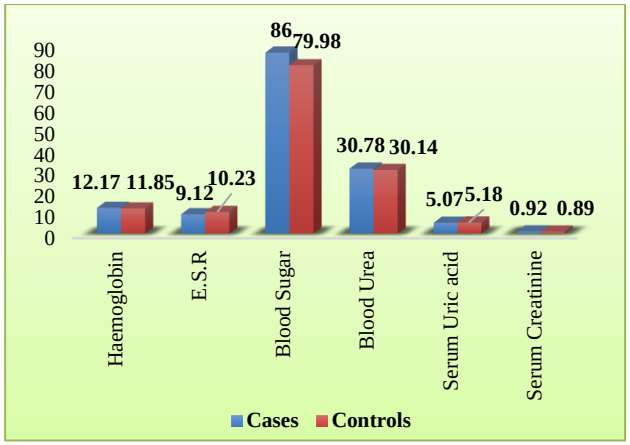

Figure 3: Mean values of biochemical and haematological parameters in cases and control groups.

The mean systolic blood pressure and diastolic blood pressure was gradually reduced at the time of presentation to after delivery in cases and controls (Table 3). No significant difference was seen in regard to haemoglobin, ESR, blood sugar, blood urea, serum uric acid and serum creatinine in cases and control groups (Figure 3).

Table 3: Mean changes in proteinuria, platelet count and urinary proteins (24 hours) in cases and control groups.

Characteristics	Time period	Cases	Controls
		Mean±SD	Mean±SD
Proteinuria	At presentation	1.73±1.24	1.43±1.37
	At delivery	1.03±1.18	1.21±1.00
	After delivery	0.59±0.98	0.74±0.89
Platelet count	At presentation	2.38±1.10	2.42±0.76
	At delivery	2.87±1.26	2.45±0.89
	After delivery	3.01±1.32	2.86±0.93
Urinary proteins (24 Hours)	At presentation	2.46±1.87	2.34±1.90
	At delivery	1.66±1.58	1.54±1.06
	After delivery	0.75±0.89	0.84±0.87

The mean proteinuria was gradually reduced at time of clinical presentation to after delivery in cases and controls. The mean serum uric acid levels in the cases was 5.07±1.42 mg/dl and in controls it was 5.18±1.06 mg/dl. The mean platelet count was gradually increased at time of clinical presentation to after delivery (Table 3).

In related to maternal outcome, majority patients delivered per vaginally and caesarean section was done in 22%, 30% in cases and controls respectively. In the view of foetal outcome, there was a less intra uterine deaths (8% in cases and 14% in controls) and neonatal deaths (2% in cases and 6% in controls) in cases than in controls. Neonatal haemorrhage was not accounted in both groups. Apgar score at 1 min and 5min is better in cases than controls (Table 4).

Table 4: Apgar score in cases and control groups.

Apgar score	Cases		Controls	
	No.	%	No.	%
At 1 min				
Less than 5	16	32	13	26
Between 5 to 7	11	22	10	20
More than 7	23	46	27	54
At 5 min				
Less than 5	8	16	8	16
Between 5 to 7	14	28	12	24
More than 7	28	56	30	60

DISCUSSION

The present study was designed to assess the efficacy of low dose aspirin (75 mg/ day) on maternal and foetal outcome in patients with preeclampsia. In preeclampsia, aspirin administration depends on platelets and prostaglandins involvement in its pathogenesis. A total 100 preeclampsia patients attending Department of Obstetrics and Gynecology were divided in to two group based on drug administration i.e. cases group has 50 patients undergone conventional therapy with aspirin and control group has 50 patients undergone with conventional therapy without aspirin.

In the present study, majority patients were between 26-30 years (48% cases and 54% controls) (Table 1). Study by Pritchard and MacDonald suggested that preeclampsia is more common in age group 26-30 years.[8] In this study, majority patients were primigravida (56% cases and 50% controls), and studies confirming that preeclampsia is more common in primigravida (Figure 1).[9]

In the present study, mean proteinuria was gradually reduced at time of clinical presentation to after delivery in cases and controls. The mean serum uric acid levels in the cases was 5.07±1.42 mg/dl and in controls it was 5.18±1.06 mg/dl. Literature suggests that elevated serum uric acid levels is a key factor to detect preeclampsia in early stages.[10] The mean platelet count was gradually increased at time of clinical presentation to after delivery in cases and controls, which is correlating with the findings of Katz et al.[11] In the present study, mean blood pressure was significantly reduced in conventional therapy with aspirin group than conventional therapy without aspirin. Results correlating with the findings of Uzan et al and Toppozada et al.[12,13]

In this study, there was a significant decrease in caesarean sections in cases (22%) and control groups (30%). Similar results were noted by Wallenberg et al and Mc Parland et al.[10,14] But no significant decrease in aspirin treated group than in control group.[15,16] No foetal complications related to maternal ingestion of low dose aspirin has been recorded in the present study. In the

view of foetal outcome, there was a less intra uterine deaths (8% in cases and 14% in controls) and neonatal deaths (2% in cases and 6% in controls) in cases than in controls. Neonatal haemorrhage was not accounted in both groups. Few studies suggested that low dose aspirin decreases perinatal mortality.[17] Whereas in present study perinatal death was less in cases (12%) than controls (18%).

CONCLUSION

A low dose aspirin (75 mg per day) from last trimester to one week before estimated date of delivery in pre-eclampsia is associated with a longer duration of pregnancy and increase in birth weight of new borns. Thus, it is effective in preventing premature deliveries, foetal growth retardation, perinatal morbidity and mortality. Overall maternal and foetal outcome is better in patients who are treated with aspirin in additional to conventional treatment than in patients who receive only conventional treatment.

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Conflict of interest: None declared
Ethical approval: The study was approved by the Institutional Ethics Committee

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