

## A STUDY OF ASSOCIATION OF SERUM FOLIC ACID LEVEL WITH PRE ECLAMPSIA IN DEPARTMENT OF OBSTETRICS AND GYNAECOLOGY AT SMS MEDICAL COLLEGE, JAIPUR

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### Abstract

**Background:** In this study was carried out to determine the relation between serum levels of Folic Acid and preeclampsia among pregnant women.

**Methods:** Methods- Hospital based comparative study was conducted at Department of Obstetrics and Gynaecology, SMS medical college, Jaipur.

**Results:** In PIH group, 20.00% women folic acid level was 3.1-7.8 ng/ml, 40.00% women folic acid level was 7.9-12.6 ng/ml, 35.00% women folic acid level was 12.7-17.5 ng/ml and 5.00% women folic acid level was 17.6-20.00 ng/ml. In normotensive group, 5.00% women folic acid level was 3.1-7.8 ng/ml, 25.00% women folic acid level was 7.9-12.6 ng/ml, 50.00% women folic acid level was 12.7-17.5 ng/ml and 20.00% women folic acid level was 17.6-20.00 ng/ml.

**Conclusion:** We conclude that folic acid is not the only element in preventing the preeclampsia, however, its serum level in case group is significantly less than control group.

**Keywords:** Eclampsia, Folic acid, Hypertension

### Introduction

Pre-eclampsia is a progressive, multisystemic disorder characterized by triad of high blood pressure to the extent of 140/90 mm Hg or more, edema and proteinuria, developing after 20 weeks of pregnancy.<sup>1</sup> It is one of the most common complications during pregnancy and the leading cause of both maternal and perinatal morbidity and mortality worldwide.<sup>2</sup>

Incidence of preeclampsia worldwide is around 5-10% of all pregnancies,<sup>5</sup> and in developing countries around 4-18%.<sup>3-4</sup> It is much more common in women who are pregnant for the first time,<sup>9</sup> and its frequency drops significantly in second pregnancies. Despite active research for many years, the etiology of this disorder remains unknown, although contributory factors including obesity, diabetes, older maternal age and job stress have been observed and studied.<sup>5-7</sup>

Although many studies have been performed about Folic Acid deficiency during pregnancy and increasing the of neural tube defects has been reported that 70% of these defects could be prevented through fortifying the foodstuff with folate besides the effect of daily consumption of Folic Acid in prevention from miscarriage, placenta abruption, improvement of fetus growth, reduction of cleft and palate risk have been documented,<sup>8</sup> however many contradictory results have been published about the role of Folic Acid in preeclampsia. Such that some studies have shown the positive effects of supplements in prevention from preeclampsia and some have rejected such effect.<sup>21</sup>

Moreover, contradictory results have been shown regarding the relation between serum levels of Folic Acid and preeclampsia.<sup>9</sup> Considering the high rate of preeclampsia and the importance of maternal, fetal and infancy complications resulting from it and also considering the importance of Folic Acid consumption during pregnancy and its probable role in prevention from preeclampsia, this study was carried out to determine the relation between serum levels of Folic Acid and preeclampsia among pregnant women.

### Materials and Method

**Type of Study:** Hospital based comparative study.

**Study Design:** Cross sectional

**Place of Study:** Department of Obstetrics and Gynaecology, SMS medical college and associated hospitals, Jaipur.

**Duration:** From Feb. 2019 compilation of two month for data collection and analysis for study.

**Study Participants:** Pregnant primigravida women  $\geq 37$  weeks of gestation.

### Inclusion criteria

- Patients giving informed and written consent.
- Cases will include primigravida with preeclampsia.

- Control group will include normotensive primigravida of comparable gestational age group

#### Exclusion criteria

- Patients with history of chronic renal disease.
- Chronic Hypertension.
- History of pre-existing diabetes or gestational diabetes.
- Cardiovascular illness.

- Any infectious diseases.
- Chronic medical disorders.
- History of smoking.
- Patient using medications (s-adenosyl methionine, carbamazepine, phenytoin and anti convulsant agents).

#### Result

**Table 1: Distribution of study population according to maternal age**

Age in Yrs	PIH		Normotensive		p-value
	No	%	No	%	
<20	0	0.00	0	0.00	0.251
20-24	28	35.00	26	32.50	
25-29	35	43.75	44	55.00	
≥30	17	21.25	10	12.50	
<b>Total</b>	<b>80</b>	<b>100.00</b>	<b>80</b>	<b>100.00</b>	

The above table shows the age distribution of the study population. In PIH group 35(43.75%) patients belonged from 25-29 yrs followed by 28(35.00%) patients belonged from 20-24 yrs and 17(21.25%) patients were belonged ≥30 age. In normotensive group 44(55.00%) patients belonged from 25-29 yrs followed by 26(32.50%) patients belonged from 20-24 yrs and 10(12.50%) patients were belonged ≥30 age.

**Table 2: Distribution of study population according to folic acid**

Folic acid (ng/ml)	PIH	Normotensive	p-value
<b>Mean</b>	10.63	13.53	0.001
<b>SD</b>	3.62	3.89	

Above table shows that the folic acid wise distribution of study subject The mean folic acid in PIH was 10.63±3.62 ng/ml and mean folic acid in normotensive was 13.53±3.89 ng/ml. (p value <0.001).

**Table 3: Distribution of study population according to folic acid**

Folic acid (ng/ml)	PIH		Normotensive		p-value
	No	%	No	%	
3.1-7.8	16	20.00	4	5.00	0.001
7.9-12.6	32	40.00	20	25.00	
12.7-17.5	28	35.00	40	50.00	
17.6-20.00	4	5.00	16	20.00	
<b>Total</b>	<b>80</b>	<b>100.00</b>	<b>80</b>	<b>100.00</b>	

Above table shows that the folic acid wise distribution of study subject In PIH group, 20.00% women folic acid level was 3.1-7.8 ng/ml, 40.00% women folic acid level was 7.9-12.6 ng/ml, 35.00% women folic acid level was 12.7-17.5 ng/ml and 5.00% women folic acid level was 17.6-20.00 ng/ml. In normotensive group, 5.00% women folic acid level was 3.1-7.8 ng/ml, 25.00% women folic acid level was 7.9-12.6 ng/ml, 50.00% women folic acid level was 12.7-17.5 ng/ml and 20.00% women folic acid level was 17.6-20.00 ng/ml.

#### Discussion

Hypertensive disorders in pregnancy stand out to be one of the leading causes of maternal and neonatal morbidity and mortality. Timely and effective intervention has utmost importance in the prevention of these complications.

Proteinuria has been an important constituent of preeclampsia.

Preeclampsia remains a leading cause of maternal and fetal morbidity and mortality. Studies have shown that alteration in the regulation and signaling of angiogenic pathway contributes to the inadequate cytotrophoblast invasion, resulting in preeclampsia. Endothelial dysfunction has been demonstrated as early as 22 weeks of gestation, and level of antiangiogenic factors starts rising as early as 17 weeks of gestation. It could be expected that microalbuminuria, a marker of endothelial dysfunction, might also be apparent by this time.<sup>10-11</sup>

The mean folic acid in PIH was 10.63±3.62 ng/ml and mean folic acid in normotensive was 13.53±3.89 ng/ml. (p value <0.001) in present study. In PIH group, 20.00% women folic acid level was 3.1-7.8 ng/ml, 40.00% women

folic acid level was 7.9-12.6 ng/ml, 35.00% women folic acid level was 12.7-17.5 ng/ml and 5.00% women folic acid level was 17.6-20.00 ng/ml. In normotensive group, 5.00% women folic acid level was 3.1-7.8 ng/ml, 25.00% women folic acid level was 7.9-12.6 ng/ml, 50.00% women folic acid level was 12.7-17.5 ng/ml and 20.00% women folic acid level was 17.6-20.00 ng/ml

Mohini P *et al* (2018)<sup>12</sup> observed that the mean serum folate was  $9.28 \pm 1.96$  ng/ml in cases and  $15.48 \pm 2.47$  ng/ml in controls; a significant difference was evident between the two groups ( $p < 0.0001$ ). Jain N *et al* (2018)<sup>13</sup> observed that  $9.41 \pm 2.99$  ng/ml in cases and  $16.21 \pm 2.12$  ng/ml in controls; a significant difference was evident between the two groups ( $p < 0.0001$ ). Makedos *et al.*<sup>14</sup> in their study did not find any significant difference between the serum level of folic acid in case and control groups.

Acilmis *et al.*<sup>15</sup> in their study showed that serum level of folic acid in case group is less than control group that confirm the results of the present study, Although this difference was not statistically significant. However, Kale *et al.*<sup>16</sup> and Mahmood *et al.*<sup>17</sup> illustrated in their studies that the serum level of folic acid in case group significantly is less than the control group that confirms the results of the present research.

All the mentioned four studies are case –control study among which the sample size of Mahmood *et al.* (79 case and 113 control) and Kale *et al.* (74 case and 100 control) are the most one. In the first two studies, the sample size was less than the present study.<sup>16-17</sup>

## Conclusion

Considering the results of the present research for recognizing the probable factor related to preeclampsia, we could conclude that although folic acid is not the only element in preventing the preeclampsia, however, its serum level in case group is significantly less than control group. Therefore, on time start and regular continuous using of supplements containing folic acid notably reduces the risk of preeclampsia. It is recommended that all health care providers educate patients especially high risk women about the importance of Folic acid, regular and timely consumption of supplements as well as food groups containing Folic acid specially fruits and its possible role in prevention of preeclampsia during counseling.

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