

**A Study of Serum Total Calcium in Preeclampsia at Medical College Hospital Rajasthan.**Reena Jain<sup>1</sup>, Pankaj Jain<sup>2</sup>, Rachit Saxena<sup>3</sup><sup>1,3</sup> MD Biochemistry, <sup>2</sup> MD Pathology<sup>1,2</sup> Senior Demonstrator, <sup>3</sup> Assistant Professor<sup>1,3</sup> Government Medical College, Bhilwara.<sup>2</sup> JLN medical Colleges, Ajmer

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**Abstract**

**Background-** Pre-eclampsia and eclampsia are leading causes of maternal mortality and morbidity in India.

**Methods-** 50 Patients diagnosed as having Pre-eclampsia with age between 18-37 years and 50 controls with similar age group.

**Results-** The mean serum calcium level in control group was  $7.98 \pm 0.94$  and in patient  $7.04 \pm 0.30$  which was statistically significant ( $p < 0.05$ ).

**Conclusion -** Serum calcium levels were significantly lowered in preeclampsia.

**Keywords :** Serum Calcium, Preeclampsia, Mortality.

**Introduction**

Pre-eclampsia and eclampsia are leading causes of maternal mortality and morbidity in India. Although much research has been performed to investigate interventions to reduce the incidence of pre-eclampsia, at present it seems that this condition cannot be prevented. Studies investigating calcium supplementation of pregnant women at risk of developing pre-eclampsia have shown that this intervention reduces the incidence and severity of the disease. Although the evidence surrounding calcium supplementation is conflicting, the most beneficial effect

has been demonstrated in women living in low dietary calcium settings<sup>1</sup>.

Low serum calcium may predispose women to pre-eclampsia for the following reasons: (1) by increasing parathyroid hormone release and thus increasing vascular smooth muscle intracellular calcium, which promotes vasodilatation; (2) by stimulating renin release, which increases angiotensin II levels; (3) by decreasing serum magnesium levels, inducing vasoconstriction in vascular smooth muscle; (4) by diminishing the effect of endothelial nitric oxide synthase, a calcium-dependent enzyme with vasodilatory action; and, finally (5) by reducing circulating prostacyclin, a calcium-dependent enzyme and a potent vasodilator.<sup>2</sup>

**Material and method**

50 Patients diagnosed as having Pre-eclampsia with age between 18-37 years and 50 controls with similar age group.

Blood samples were collected under aseptic precautions in plain vacutainer for serum uric acid estimation.

Patients with history of renal disease, chronic hypertension, cardiovascular disease, thyrotoxicosis, liver disease were excluded.

The serum calcium concentrations were measured and the corrected calcium level was calculated by the laboratory. Corrected calcium was calculated in millimoles per litre (mmol/l) using the formula: corrected calcium = measured total calcium (mmol/l) + 0.02[40 – serum albumin (g/l)]

**Results**

Table 1: Shows the mean serum calcium levels in patients and controls.

Serum calcium	Case	Control
Mean	7.04	7.98
SD	0.30	0.94
p-value	<0.05	

The mean serum calcium level in control group was 7.98± 0.94 and in patient 7.04 ± 0.30 which was statistically significant(p <0.05).

**Discussion**

Change in blood pressure during preeclampsia are attributable to change in serum calcium levels which could be best explained by the level of intracellular calcium. The increase in intracellular calcium or decrease in serum calcium levels leads to constriction of smooth muscle in blood vessels and subsequent increase in vascular resistance. Ionized calcium is also crucial for synthesis of NO and prostacyclin and hence calcium deficiency also aggravates oxidative stress.

The protective effect of calcium on blood pressure can be explained by the influence of calcitrophic hormones on intracellular calcium. 1, 25-dihydroxyvitamin D stimulates calcium influx in a variety of cells, including vascular smooth muscle cells. As a consequence, 1,25-dihydroxyvitamin D exerts a repressor effect, serving to promote contraction and increase peripheral vascular resistance. Consequently, low calcium diets, which elicit a 1, 25- dihydroxyvitamin D response, would be expected to increase blood pressure<sup>3</sup>.

**Conclusion**

Serum calcium levels were significantly lowered in preeclampsia.

**References**

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