INTRODUCTION
Preeclampsia is one of the most common complications of pregnancy (1). Preeclampsia occurs in 7–10% of all pregnancies in India (2). In Kerala, mild preeclampsia is seen in 8-10% and severe preeclampsia in 1% (3). Although the exact cause of preeclampsia is still unknown, the basic pathology lies in the endothelial dysfunction and intense vasospasm (4). Magnesium is necessary for both fetal and maternal wellbeing. The low concentration of magnesium in serum exposes the subject to a risk of pregnancy complications like preeclampsia (5). Magnesium has a significant role in pathophysiological regulation of blood pressure because it affects contractility and tone of blood vessels (6). Various studies demonstrated the relationship between preeclampsia and changes in concentration of biochemical parameters such as serum magnesium. Recent studies suggest low serum magnesium concentration in pregnancy is associated with an increased risk for developing preeclampsia. Serum magnesium appears to play an important role in the pathogenesis of preeclampsia. There are reports pointing out the beneficial effects of magnesium supplementation in improving endothelial function (7).

OBJECTIVES
The aim of this study is to study and compare the levels of serum magnesium in healthy non pregnant women, normal pregnancy and in preeclampsia.

MATERIALS AND METHODS
Present study was a cross sectional comparative study which is done to assess the levels of serum magnesium in healthy young women, normal pregnancy and in preeclampsia. The study was conducted for a period of 1 year from July 2015 to June 2016. Study was conducted in obstetric OPD and antenatal wards of Institute of Maternal and Child Health, Government Medical College, Kozhikode.

Three study groups were selected according to inclusion and exclusion criteria. Prior to registering, an informed consent was taken and counseling was given to all patients. Sample size was calculated by using software called Epi Info. Study population consisted of women in age group between 18-30 years divided into 3 groups.

Study Group 1: 40 Healthy non pregnant women

Study Group 2: 40 Normotensive primigravida with gestational age between 34-40 weeks

Study Group 3: 40 Preeclamptic primigravida with gestational age between 34-40 weeks

RESULTS
The mean serum magnesium levels were 2.71 ± 0.24 mg/dL, 1.90 ± 0.21 mg/dL and 1.64 ± 0.26 mg/dL respectively in healthy young women, normal pregnancy and in preeclampsia. There was a significant decrease in the serum magnesium levels in the normal pregnancy as compared to those in the nonpregnant women and the level is significantly decreased further in preeclampsia.

EXCLUSION CRITERIA
Any history of:
• Chronic hypertension
• Diabetes
• Kidney disease
• Liver disease
• Coagulation disorders
• Multiple Pregnancy
• Magnesium sulphate therapy

Prior informed consent had taken from all. A detailed history was taken from all subjects. Blood pressure recording along with a detailed physical examination was done. Urine protein was detected using dipstick method. 2mL of blood was collected under aseptic precautions for doing serum magnesium estimation using ERBA fully automatic analyzer.

RESULTS
Statistical analysis has been done to determine the differences between the 3 groups. Data were analyzed using Microsoft excel and Statistical Package for Social Sciences (SPSS) version 18. Results were expressed as Mean ± SD. Mean differences between the groups were analyzed using ANOVA (Analysis of Variance). It is used to test whether there is a significant difference among two or more independent groups. The p value <0.05 was taken as the level of significance.
inhibition of NO synthase in endothelial cells (16). This can lead to decreased vasodilatation and causes an increase in the arterial blood pressure (17). Endothelial dysfunction refers to an imbalance in the endothelial production of mediators that regulate vascular tone, platelet aggregation. In the endothelium, magnesium increases production of prostacyclin which in turn decreases platelet aggregation. Hypomagnesaemia impairs endothelial function by inhibition of endothelial prostacyclin synthesis, increased endothelium production and release and increased platelet aggregability. Endothelial dysfunction is said to be the most important factor in the etiopathogenesis of pre eclampsia (18).

Some reports point out the beneficial effects of magnesium supplementation in improving endothelial function (7). Magnesium sulphate therapy is used for the prevention and treatment of convulsions. A common pathway for the release of intracellular calcium from many stimuli such as hormones, growth factors and neurotransmitters is phospholipase C activation and hydrolysis of phosphatidyl inositol 4,5 biphosphate into inositol 1,4,5-triphosphate (IP3) (19). Therapeutic magnesium sulphate which is used in the treatment of PIH inhibits phosphatidylinositol-4, 5 biphosphate specific phospholipase C activity and subsequently decreases calcium release in the cells, thus leading to low intracellular calcium levels and a decrease in blood pressure (20).

CONCLUSION

From the observations and results of present study, it can be concluded that serum magnesium levels were decreased in pre eclampsia compared to normal pregnancy and healthy young women. These findings may play an important role in the pathogenesis of pre eclampsia. Screening of serum magnesium levels and correction of the same in pregnancy may prevent the risk of developing pre eclampsia.

REFERENCES