**Introduction**

The purpose of this study was to estimate the correlation between first trimester placental volume with maternal characteristics and serum pregnancy-associated plasma protein-A (PAPP-A) and preeclampsia (PE) in twin pregnancy.

**Method**

A retrospective study was performed with 653 women with twin pregnancy at first trimester was enrolled, of which 48 women developed PE from June 2006 to December 2018. This study analyzed the risk of PE according to the measurement of 2D (two-dimensional) ultrasound findings of placenta at 11\(^{0}\) to 13\(^{6}\) weeks. The enrolled pregnant women with twin pregnancy were followed until delivery at Bundang CHA Medical Center. The maternal serum markers analyses were performed. The placental ultrasound exam and maternal serum pregnancy-associated plasma protein A (PAPP-A) was determined at 11\(^{0}\) to 13\(^{6}\) weeks. We assessed the association of the measurement of placental volume and PE at first trimester in twin pregnancy by using multiple logistic regression analysis.

**Results**

Forty-eight of the 653 women (7.4%) developed PE in twin pregnancy. There were no significant differences in the maternal age and body mass index (BMI) at the first trimester pregnancy. However, the gestational age at delivery was significantly different between the normal and PE group (\(p < 0.001\)). In the PE group, median multiples of median (MoM) values of PAPP-A, MSAFP, hCG, uE\(_3\), and inhibin A were not significantly different compared to the normal group. On the other hand, the placental weight at delivery did not differ statistically difference between the normal and the PE group. The EPV at first trimester was significantly lower in women with PE compared to those without PE (\(p=0.029\)). In addition, we predicted PE using combined maternal age, BMI, PAPP-A and EPV which were achieving the value 0.62 in combined model of logistic regression analysis.

**Conclusion**

First-trimester placental volume is strongly associated with the risk of PE in twin pregnancy.