Objective: To create a multi-variable decision model based on maternal and fetal sonographic variables for the prediction of a spontaneous vaginal delivery in the term nulliparous parturient before the onset of labor.

Method: Nulliparous women carrying a singleton fetus in vertex presentation at 37.0-42.0 weeks of gestation were recruited at the post date clinic. Sonographic measurements included estimated fetal weight and pelvimetric measures: pubic arch angle and angle of progression. Descriptive and comparative analysis was performed between the two outcome groups: spontaneous vaginal delivery (SVD) unplanned operative delivery (UOD) which included vacuum assisted, forceps assisted and cesarean deliveries. Logistic regression was used in univariate and multivariate models of risk for unplanned operative delivery UOD.

Results: 234 patients comprised the study group: 160 patients had a spontaneous vaginal delivery, and 74 patients had an unplanned operative delivery. Analysis of Maximum Likelihood Estimates revealed a multivariate model for prediction of UOD including the parameters of maternal age, height, sonographic PAA, AOP and EFW with an area under the curve of 0.7076. A multivariate decision model for prediction of an UOD based on maternal and fetal sonographic parameters was created.

Conclusion: In this study we present a combination between measurements performed before the onset of labor that represent the pelvic configuration and the maternal-fetal interface performed on real time 2-D ultrasound images. This data may aid the obstetrician in the counseling process prior to delivery and may have significance in rural or indigent areas at which appropriately timed transfer to a district hospital have great impact on maternal and neonatal morbidity.