[EP01.13] Importance of ultrasonographic cervical length around 20 weeks of gestation for predicting spontaneous preterm labor: An artificial-neural-network analysis

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Objectives
Little study based on the artificial neural network (ANN) is done on the role of cervical length in spontaneous preterm labor. This study investigated the importance of the ultrasonographic cervical length around 20 weeks using an ANN.

Methods
Data came from a tertiary university hospital with 596 obstetric patients during March 27, 2014 – August 21, 2018. (Table 1) Six machine learning methods were applied and compared for the prediction of preterm birth. Variable importance, the effect of a variable on model performance, was used for identifying the cervical length as a major determinant of spontaneous preterm labor. Analysis was done on December, 2018.

Results
The accuracy of the ANN (0.9115) was similar with those of logistic regression and the random forest (0.9180 and 0.8918, respectively).

Conclusion
Based on variable importance from the ANN, the ultrasonographic cervical length (0.0001) had a higher performance than age (0.0001), prior preterm birth (0.0001) and myomas & adenomyosis (0.0001). (Figure 1) However, major determinants over the cervical length were body mass index (0.0164), hypertension (0.0131) and diabetes mellitus (0.0099) as well as prior cone biopsy (0.0099).