Objective
To evaluate whether cervical shear wave elastography (SWE) can improve the predictive performance of the outcome of induction of labour (IOL) when combined with other ultrasound-based assessments as compared to using Bishop score.

Methods
Women who required IOL were recruited prospectively. Prior to routine digital assessment of Bishop score (BS), transvaginal ultrasonic measurement of cervical length, posterior cervical angle, angle of progression, and SWE was performed, and the result was blinded to the clinicians. SWE value of the inner, middle and outer regions of the cervix was measured to assess the homogeneity. Association of IOL outcomes including the overall caesarean section (CS) and CS for failure to enter active phase, with cervical ultrasonic parameters and BS were assessed using multivariate regression analyses. Predictive accuracy of the outcomes using models based on ultrasound measurement and BS was compared using the area under the curves (AUC).

Results
Among 472 subjects, 393 (82.7%) had a vaginal delivery. SWE value were significantly higher in the inner cervical region compared to other regions indicating a greater stiffness (p<0.001). Both Inner SWE and cervical length were independent predictors of overall CS (respective aOR & 95%CI: 1.338 [1.001-1.598] and 1.717 [1.077-1.663]) and CS for failure to enter active phase (respective aOR & 95%CI: 1.689 [1.234-2.311] and 2.556 [1.462-4.467]), after adjusting for other covariates. Outcome prediction models using inner SWE and cervical length had increased AUC compared to models using BS (0.888 vs 0.819, p=0.009).

Conclusion
SWE demonstrated that the cervix is not a homogenous structure, with the inner cervix having the highest stiffness. SWE and cervical length are independent predictors of induction outcome and models based on them had higher overall predictive accuracy compared to that based on BS.