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Predicting success of induction of labour using cervical stiffness

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Introduction: Cervical softening is part of the preparation for labour and delivery. It is the result of the breakdown of extracellular matrix by enzymes such as collagenases and metalloproteinases. The Pregnolia® System cervical aspirator is a new medical device that measures the stiffness of the cervix. Compared to the semi-quantitative and subjective Bishop-Score, this new test provides an exact value. Previous studies established a reference curve for cervical stiffness during normal pregnancy. So far, there are no data available from women prior to induction of labour (IOL).

Material and Methods: We performed a prospective cohort study (Pregnolia® Bern Study, (PBS)), evaluating cervical stiffness by using the Pregnolia® System. One part of the study included women with clinically indicated induction of labour between 370/7 and 416/7 weeks of gestation with history of previous caesarean section. The induction was undertaken with a balloon catheter. We assessed the cervical stiffness, placental-associated macroglobulin-1 (PAMG-1) test (Partosure®), and performed measurement of the cervical length by transvaginal ultrasound. Primary outcome was if cervical stiffness is related to the induction to delivery time interval. The study was approved by the ethical committee; all participating women gave a written informed consent. We present the results of the first 20 women who were included in our study.

Results: Since August 2020, 20 women with history of a caesarean section and indicated IOL were included. The mean stiffness (three consecutive measurements) was 49.4mbar SD± 34.2 (first measurement 57.6mbar±38 / second measurement 50mbar±39.2 / third measurement 46.8mbar ±39.6). The mean time interval between induction and delivery was 26.4h ±10.6. Nine women had a vaginal delivery (seven spontaneous, two assisted). Eleven women had another caesarean section. The time-to-delivery was not significantly different in both groups (24.7h vs 27.7h). Cervical stiffness in women who gave birth vaginally was 38.5mbar±23 prior to IOL, compared to women who gave birth by caesarean section who had a higher stiffness of 58.3mbar±40.14. The difference was not significant (p=0.21). Mean cervical length was 29.31mm ±9.28 with no difference in both groups. The Partosure test was only positive in one patient.

Conclusion: Our data show that a soft cervix before IOL appears to have predictive value for achieving vaginal delivery in women with a previous caesarean section.