Streszczenie angielskie / English summary

Uterine cervix is a part of female reproductive system which function is to sustain pregnancy until its due date. As long as cervix is firm, long and closed, it is able to withstand systematic growth of pressure generated by growing pregnant uterus content. Although, according to some scientists, cervix is classified as an integral part of uterus, in fact it seems to be an organ of a different histological structure and playing a different role. Structural changes in cervix called maturation occur in four subsequent stages. When correctly initiated in time, they are a physiological phenomenon leading to a labour in term. Collagen fibers with their spatial structure changes and hialuronic acid synthesis augmentation causing softening of maturing cervix play a leading role in this process.

Changes in cervix which are not initiated correctly in time lead to premature labour or post-term pregnancy, which can lead to newborns complications. The etiology of above phenomenons is still unexplained despite constant intensive progress in perinatology. It is known that cervix plays a crucial role in onset of labour. Nowadays cervix examination is based on palpation and ultrasound measurement of cervix canal length. Both methods have a restricted predictive value, in premature labour detection as well as in post term pregnancy. There is no valid method so far, which enables to determine the time and length of labour. There is on-going intensive search for a method enabling early detection of high risk pregnances. Cervix consistency evaluation by elastography can bring new possibilities. This method has been used so far in liver, thyroid-, salivary glands- and breasts diagnostics. It is based on generating tissue deformation caused by rhytmic movements of ultrasonograph probe. It is possible to calculate the difference of elasticity between examined tissue and the point of referrence based on the degree of deformation and time needed to return to primary form.

In this study determination of elastography utility in prognosing the time and length of labour, standarisation of the method mentioned above in pregnant cervix evaluation was performed. Elastography parameters correlation with gestational age at examination and of time to labour was evaluated. The relation between elastography parameters and ultrasonography measurement of cervix canal was also analysed.

Two hundred and sixty two pregnant women between 16-39 weeks of pregnancy were enclosed to this study. Three hundred and eighty four elastographic examinations were carried out. A detailed obstetric history was collected in addition to each patient examination. At first, cervix canal length was measured according to existing criteria. Then, during the same examination, elastographic analysis was carried out. Measurements of 7 regions of interest were performed for each patient. The results were presented using strain ratio for each region of interest separately. In order to check the reliability of the elastography parameters, a precision of measurement, was performed using intraclass correlation coefficient. It was shown that the measurements should be analysed cautiously, considering well and average consistency of obtained results.

Data analysis enabled to point statistically significant correlation between strain ratio of each region of interest and gestational age at time of examination, time to labour and a labour length. A statistically significant reverse correlation between cervix canal length and strain ratio of particular region of interest was obtained. For most analysed data relations between regions localised in inner orifice cervix area, proximal and medial part of cervix area were shown. The obtained results were commented and compared to the data in the literature on elastography.

In conclusion, obtained results show that elastographic examination of cervix can be used as an additional, complementing tool to diagnostic methods available today to predict time of labour. Today elastography, an innovative method as it is, has still a limited precision limiting its use as the sole tool for cervix examination. The results justify further studies, in particular on elastography standardisation technique.