Abstract

Vaginal birth after a previous caesarean section is a very actual topic for its potential in reduction of caesarean section rates. It has been widely discussed and studied in the world literature. Numerous guidelines dealing with management of this birth and the identification of both positive and negative outcome predictors were produced by scientific communities and administrative boards. However, the risk of childbirth related injury in women giving birth vaginally after a previous caesarean section was not clearly studied. Studies evaluating perineal injuries have conflicting results, while injuries to the higher levels of the pelvic floor have not yet been studied.

In the first part of the presented research work, **we retrospectively evaluated perineum and anal sphincter injuries in women who delivered vaginally after a previous caesarean section.** We compared the results with a group of primiparous women after vaginal delivery. We also monitored the presence of risk factors for pelvic floor injury, including the influence of the timing of the previous caesarean section. It has been proven that women, who delivered vaginally after a previous caesarean section have significantly shorter first stage of labor. There was no difference in the frequency of perineal including anal sphincter injuries in both groups of parturients. In the group of VBAC women, cervical injuries were treated statistically more often.

The second part of the research was focused on the evaluation of the presence of **pelvic floor injury in VBAC group**. Based on the results of the previous study, the occurrence of MLA avulsion injury was expected to occur more frequently compared to the control group of primiparous women. The diagnosis was performed using 4D transperineal ultrasonography. From other parameters, the area of urogenital hiatus and the presence of balooning were monitored. The secondary aim of the work was to clarify the influence of the timing of the indication of previous caesarean section on the pelvic floor of women after VBAC. VBAC women were older and their deliveries were significantly shorter compared to primiparous women. However, these differences were not reflected in the evaluation of the presence of MLA avulsion, in the difference in the area of urogenital hiatus or in the presence of ballooning in both compared groups. A statistically significant differencies were not found between subgroups of VBAC women divided according to vaginal findings in the time of indication of a previous caesarean section. The limitation of this work were small groups of patient.

The aim of the following **multicentric observational study** was to elucidate the effect of VBAC on the development of MLA injury in a larger cohort of patients that would allow evaluation of results with statistical significance. The methodology used in this work was consistent with the previous study. The results were compared with a control group of primiparous who gave birth in the same perinatal centers. It has been shown that women after VBAC have a significantly higher risk of pelvic floor injury, even after controlling for risk factors such as age and BMI. There were no statistically significant differences in the area of the urogenital hiatus and the presence of ballooning between the groups. In a **pilot study the influence of the timing of the previous caesarean section on pelvic floor injury was evaluated.** VBAC women were divided into two groups according to vaginal findings in time of the indication for SC performance. The cut-off value was the transition from the passive to the active phase of labour. The

methodology of the examination was the same as in the previous two studies. Comparisons between the two groups did not reach statistical significance.

In the last part of the research work**, a systematic review study** was carried out, which summarized the conclusions of all available scientific literature dealing with MLA injuries after the first birth, including birth by caesarean section. A meta-analysis of 37 primary non-randomized trials from 17 countries reported the incidence of MLA avulsion in 1% after caesarean section, 15% after spontaneous vaginal birth, 21% after vacuumextraction, and 52% after forceps. There was no difference in the diagnosis of the present injury when using sonography or magnetic resonance imaging. Based on the results of this work, the optimal time for the diagnosis of injuries was recommended - 6 months after birth or 12 months after forceps delivery. These findings were put in context with the conclusions of the abovementioned studies.

The obtained data contributed to the pool of knowledge regarding the risks of pelvic floor injury in women after VBAC.