Amniocentesis and cerclage: correlation between Interleukin 6 as a marker of infection

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Objective

Cervical cerclage is a surgical procedure that can prevent miscarriage or preterm birth in patients with cervical insufficiency and/or history of pregnancy losses. Severe complications may occur if cerclage is performed in patients with intra-amniotic infection. High levels of intraamniotic interleukin-6 (IL-6) were shown to be associated with intraamniotic infection. However, amniocentesis and IL6 sampling before cerclage is not yet a widely accepted routine procedure. Our goal was to analyse a cohort of patients who underwent cerclage in our institution (tertiary perinatology centre), where IL6 sampling has been a standard to rule out intraamniotic infection (with 2000 ng/L threshold) for more than 10 years.

Methods

Retrospective analysis of all pregnant patients who underwent cervical cerclage at our institution from 01.01.2013 to 01.02.2023. The primary outcome was the analysis of the IL6 value from the AMC performed before the procedure in relation to the interval between cerclage and delivery or miscarriage. Secondary outcomes were descriptive statistics of the cohort and analysis of other variables in relation to the cerclage outcome (values of markers of inflammation obtained from blood; presence of histological signs of inflammation in placenta; functional length of cervix measured by ultrasound). Statistical analysis was performed using the GraphPad Prism program. The results are evaluated as statistically significant at a value of $p \leq 0.05$.

Results

During the monitored period, a total of 111 cerclages were performed on pregnant patients at our hospital. From them, 15 women were excluded from the analysis, as 11 did gave birth elsewhere, and other 4 are still pregnant. From the 96 remaining cases, 69 of them had singleton pregnancies and 25 were multiple pregnancies. This work will focus on singleton pregnancies, which are further divided into subgroups depending on the indication for cerclage: 1) on the basis of anamnesis (history indicated - HI) of previous pregnancy losses or premature births (n = 14; 20.3%), 2) on the basis of an ultrasound finding (ultrasound indicated - USI), a shortened cervix with a functional length of ≤ 10 mm (n = 30; 43.5%) or 3) rescue cerclage (Rescue – R) in case of prolapsed sac of membranes into the vagina (n = 25; 36.2%). The average patient indicated for cerclage was 34 years old, gravida 3 para 1, with a BMI of 23. 19% conceived after some of the IVF methods. The cerclage was most often applied at week 21^{+3}, delivery occurred in an average of 90 days, at week 37^{+3}, and the median foetal weight was 2755g. 91.3% (n = 63) of patients went home with a live baby, while 8.7% (n=6) miscarried or the new-born died after delivery. In 81% (n = 56) a diagnostic amniocentesis (AMC) was performed before the procedure, with a median IL6 value of 755.5 ng/L. Statistical analysis showed a negative correlation between the value of IL6 and the interval between cerclage and the time of abortion/delivery, both in the whole group of singleton pregnancies ($p < 0.0001$) and in its subgroups HI ($p = 0.0003$), USI ($p < 0.0001$), R ($p < 0.0001$). Histological evidence of chorioamnionitis in the placenta was negatively correlated with the length of pregnancy in group R ($p = 0.0039$). Neither the values of inflammation markers from the blood (CRP and LEU) nor the functional length of the cervix before cerclage, had a significant relationship with the subsequent length of pregnancy.

Conclusion

The IL6 value from the amniotic fluid before cerclage is a good predictor of outcome in contrast to markers of inflammation from maternal blood.