The Prognostic Values of Vaginally Obtained Amniotic Fluid IL-6 and TNF-α for Fetal Inflammatory Response Syndrome

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Abbreviations

- IL-6 - interleukin-6
- TNF-α - tumor necrosis factor-α
- PROM - premature rupture of membranes
- FIRS - fetal inflammatory response syndrome
- ELISA - the enzyme-linked immunosorbent assay

Background

•Preterm PROM occurs in 3 percent of all pregnancies and is associated with intrauterine infection.

•FIRS is the heaviest fetal damage due to intrauterine infection.

•The choice of preterm PROM management requires balancing the benefits of pregnancy prolongation and the risk of FIRS.

•Most of the tests to predict FIRS are an invasive procedures or tests of maternal serum that have moderate prognostic value.

Objectives of the study

1. To determine the cut-off and prognostic value of IL-6 in vaginally obtained amniotic fluid for FIRS in patients with preterm PROM.

2. To determine the cut-off and prognostic value of TNF-α in vaginally obtained amniotic fluid for FIRS in patients with preterm

Methods

- A prospective case-control study
- Participants: 40 women with preterm PROM and their neonates

Vaginal collection of amniotic fluid (less than 24 hours before delivery)

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The measurment of IL-6 and TNF-α levels by the ELISA

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Groups of participants

Control group
Patients, whose neonates had FIRS

Case group
Patients, whose neonates did not have FIRS

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Statistical analysis to compare IL-6 and TNF-α levels between groups and to compute the cut-off value for FIRS

Results

Characteristics	Median ± SE	
	Control group (N=23)	Case group (N=17)
Age (years)	30 ± 1.7	30 ± 1.5
Gravity	2.0 ± 0.3	2.0 ± 0.5
Parity	2 ± 0.2	1.0 ± 0.3
Gestation (weeks)	33.0 ± 0.4	32 ± 0.7
PROM to delivery interval (mins.)	2438 ± 771	686 ± 1428.3
White blood cells (x10⁹/L)	12.4 ± 0.8	11.5 ± 1.2
C-reactive protein (mg/l)	3.3 ± 4.1	11.9 ± 4.7
Neonatal birth weight (grams)	2070 ± 102.6	1510 ± 141.8
Apgar score after 1 min.	8 ± 0.1	7 ± 0.5
Apgar score after 5 min.	9 ± 0.2	9 ± 0.5
pH of umbilical artery	7.35 ± 0.01	7.37 ± 0.02

Table 1. Maternal and neonatal characteristics

	Control group	Case group	p-value
IL-6 (pg/mL)	633,5	1562,5	0,02
TNF-α (pg/mL)	9,7	74,9	0,002

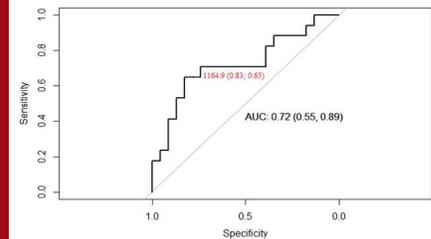**Table 2.** Median concentrations of amniotic fluid IL-6 and TNF-α

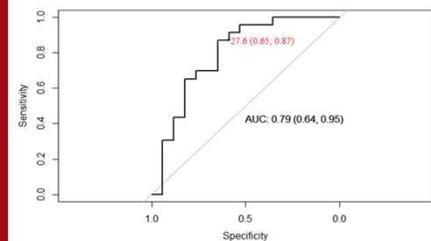**Figure 1.** ROC curve and the cut-off value of IL-6

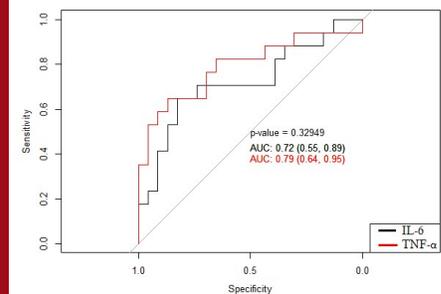**Figure 2.** ROC curve and the cut-off value of TNF-α

Figure 3. Comparison of the ROC curves of IL-6 and TNF-α

Conclusions

1.The cut-off value of 1164.9 pg/mL for IL-6 and 27.6 pg/mL for TNF-α in vaginally obtained amniotic fluid seems to be a good predictive factor for FIRS.

2.The non-invasive collection and analysis of amniotic fluid could be an alternative for diagnostic amniocentesis.