

The Cytokine Profile of the Endometrial Fluid in Women with Primary Infertility

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The study included 96 patients, divided into two groups. The study group (L₁) included 48 patients with the established diagnosis of primary infertility, and the control group (L₀) included 48 fertile patients.

Endometrial fluid samples were collected during the proliferative phase of the menstrual cycle using a Pipelle® de Cornier (CooperSurgical, Trumbull, Connecticut, USA) endometrial suction curette.

The main outcomes were concentrations of IL-1β, IL-8, IL-10, and IL-4 in endometrial fluid.

BACKGROUND AND AIMS

The endometrium functions as an active immunological organ, where cytokines modulate local inflammatory responses essential for implantation.^{1,2} A subtle equilibrium between pro- and anti-inflammatory mediators, such as ILs, is required for synchronised embryo–endometrial dialogue. Alterations in this cytokine milieu may compromise endometrial receptivity and contribute to primary infertility, even in the absence of structural or hormonal abnormalities.³ The objective of this work was to assess the endometrial cytokine profile of the endometrial fluid in women with primary infertility.

MATERIALS AND METHODS

A prospective cohort study was conducted at the Department of Obstetrics and Gynecology, Nicolae Testemitanu State University of Medicine and Pharmacy, Chișinău, Moldova. The protocol of this study was approved by the Research Ethics Committee of Nicolae Testemitanu State University of Medicine and Pharmacy (number 79/62 of 26.04.17). Patients signed informed consent for participation in the research.

RESULTS

The level of IL-1β was considerably increased in the L₁ group: the mean IL-1β value was 1,044.7±871.5 pg/mL, with a median of 679.3 pg/mL. In the L₀ group, the mean level was 345.3±491.8 pg/mL, with a median of 210.5 pg/mL, and a range between 16.5–3,150.8 pg/mL (p<0.001). For IL-4 in the L₁ group, the mean value was 220.9±100.1 pg/mL, with a median of 201.8 pg/mL and values ranging from 92.8–415.6 pg/mL. In the L₀ group, the mean was 197.5±90.1 pg/mL, with a median of 188.0 pg/mL and a range between 56.6–420.7 pg/m (p=0.3). In contrast, IL-8 showed significantly higher levels in the L₁ group. The mean IL-8 level was 992.2±844.4 pg/mL, with a median of 665.6 pg/mL and values ranging from 141.9–3,528.4 pg/mL. In the L₀ group, the mean value was 648.3±623.9 pg/mL, with a median of 473.3 pg/mL and a range between 126.5–3,401.6 pg/mL (p=0.014). For IL-10, an anti-inflammatory cytokine, no significant differences were observed between the two groups. In the L₁ group, the mean IL-10 level was 186.1±30.7 pg/mL, with a median of 182.4 pg/mL and values ranging from 122.4–254.3 pg/mL. In the L₀ group, the mean level was 186.9±34.3 pg/mL, with a median of 181.0 pg/mL and a range between 136.5–257.5 pg/mL (p=0.9).

CONCLUSION

In this study, the authors concluded that the levels of proinflammatory cytokines in the endometrial fluid, such as IL-1 β and IL-8, were higher in patients with primary infertility than in the control group. Therefore, the levels of anti-inflammatory cytokines (IL-10 and IL-4) did not show any statistically significant differences between the groups.

Endometrial immune status in patients with primary infertility is characterised by a marked predominance of the Th1 cytokine profile, supporting significant levels of proinflammatory cytokines.

The results of this study may be a first step in the development of diagnostic tests for pro- and anti-inflammatory cytokines in patients with infertility.

References

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