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The levels of inflammatory and autoimmune markers in women with endometriosis

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ABSTRACT

Genital endometriosis is a frequent gynecologic problem of reproductive age women. The aim of present investigation was to determine the levels of anti-endometrial antibodies and inflammatory markers in peripheral blood of women with different clinical forms of genital endometriosis. Combined form of genital endometriosis was chracterised with significantly activated inflammatory mediators (TNF -α and IL-6) and increased antiendometrial antibodies in comparison with other forms of endometriosis.

Keywords: genital endometriosis, autoimmune antibodies, inflammation

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I. INTRODUCTION

Endometriosis is defined as the implantation of endometrium-like glandular and stromal cells outside their normal location in the uterus [1]. It is a frequent gynecologic disease with a prevalence of about 10-15% of reproductive-aged women [2],[3]. About 25 to 50% of infertile women have endometriosis, and 30 to 50% of women with endometriosis are infertile [4], [5]. Abnormal folliculogenesis and oocyte maturation, increased radical oxidative stress, as well as imbalances in the levels of cytokines, interleukins and various growth factors have been described as potential contributors to impaired fertility in women with genital endometriosis [7].

The present study aimed to investigate the reproductive outcome depending on serum anti-inflammatory cytokine and antiendometrial antibody profiles in the women with endometriosis compared with the healthy controls and the possible role of these markers in the prediction of the reproductive complications.

II. MATERIALS AND METHODS

Tumor necrosis factor alpha (TNF- α), interleukin-6 (IL-6) and anti-endometrial antibodies (AEA) were measured in peripheral blood of 100 reproductive age women with genital endometriosis. The study protocol was reviewed and approved by the Problem Commission on the base of Azerbaijan Medical University.

The women with genital endometriosis were classified as peritoneal endometriosis (1-st group), extraperitoneal endometriosis (2-nd group), combined genital endometriosis (3-rd group); (n=53, n=31, n=16 respectively). Control group (4-th group) comprised of 30 healthy women without endometriosis.

Blood Collection

Venous blood was collected on days 1 and 3 of life. No venous punctures were performed for the sole purpose of study-related analysis. The blood samples were collected in EDTA tubes and centrifuged for 15–20 min. The plasma samples were frozen at −70°C. Grossly hemolyzed samples were not included in the analysis.

TNF-α, IL-6 and AEA in the peripheral blood on ELISA.

The plasma concentrations were measured using the aforementioned commercial kits, based on a standard enzyme immunoassay procedure [6]. The specimens were diluted according to the manufacturer's instructions for the ELISA kits to obtain the optimal density. The results are expressed in pg/mL.

III. STATISTICAL ANALYSIS

The Student t-test and the Mann-Whitney test were used for comparison of parametric and non-parametric parameters. Non parametrical data are presented as means ± SD. Categorical data were analyzed by the Fischer exact test. In all instances, significance was established at $p < 0.05$.

IV. RESULTS

As shown in table 1, it was determined high TNF-α in all groups of women with genital endometriosis compared with control group parameters ($p<0.05$). IL-6 levels were significantly higher in 1-st and 3-rd group women ($p<0.05$) in comparison with 4-th group, whereas it was not detected the signficance between 2nd and control groups (table 2). Table 3 presents the levels of AEA in study groups. The activity of autoimmune process, as well as AEA concentrations were higher in 2nd and 3rd groups' women in comparison with 1-st group women ($p<0.05$).

Table 1. Blood TNF-α concentartions (pg/ml) in research groups

Groups	N	Mean	Standard deviation	Standard error	Minimum	Maximum
1st group	53	57,0189*	4,31228	0,59234	43,00	69,00
2nd group	31	62,7097*	4,57671	0,82200	54,00	72,00
3rd group	16	67,8750*	5,93155	1,48289	57,00	75,00
4th group	30	48,9667	7,51313	1,37170	30,00	59,00

** p<0.05 in comparison with control (4-th) group.*

Table 2. Blood IL-6 concentartions (pg/ml) in research groups

Groups	N	Mean	Standard deviation	Standard error	Minimum	Maximum
1st group	53	15,5868*	0,98333	0,13507	14,00	19,00
2nd group	31	13,5742	2,46522	0,44277	9,00	19,00
3rd group	16	19,6000*	2,18296	0,54574	16,60	25,00
4th group	30	11,1700	2,85912	0,52200	5,00	17,00

** p<0.05 in comparison with control (4-th) group.*

Table 3. Blood AEA concentartions (pg/ml) in research groups

Groups	N	Mean	Standard deviation	Standard error	Minimum	Maximum
1st group	53	19733,96	16153,63	2218,87	3000	90000
2nd group	31	73225,80*	27099,45	4867,20	30000	130000
3rd group	16	56562,50*	40890,04	10222,51	2000	120000
4th group	30	7980,00	2762,60	504,38	4000	13000

* p<0.05 in comparison with control (4-th) group.

V. DISCUSSION

We detected the activated inflammatory mediators (TNF -α and IL-6) and increased antiendometrial antibodies depending on the clinical forms of genital endometriosis. Combined form endometriosis was characterised with more complicated inflammatory and autoimmune processes. Featires of immune deficiency in the background of autoimmunization have been observed in patients with endometrioid injury, which are the signs of weakening of immune control. In our research, it has been found that patients with genital endometriosis have an active pathological process, which in turn promotes the development and implantation of functional centers of endometrium in non-normal localizations [8], [9]. Accordingly, the appropriate pathologic process is characterized with morphological, hemodynamic, vascular and connective tissue changes at the cellular level and ensures the progression and ending of the endometrioid hearth.

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