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The features of synthesis the antagonist receptor of interleukin-1 in the serum of patients with an activated recurrent herpes simplex virus infection of first / second type in infertility patients

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Abstract

This work is devoted to the synthesis of antagonist receptor of interleukin-1 (IL-1Ra) in the serum of patients with an activated recurrent herpes simplex virus infection first / second type (HSV 1/2) and infertility patients. The study involved 120 patients aged from 35 years to 50 years, 63 of them were fertile and 57 infertile. The control group consisted of 20 healthy individuals of similar age. The concentration of IL-1Ra in serum were determined by ELISA method. Revealed marked reduction of proinflammatory cytokines - IL-1Ra serum of patients (fertile and infertile) enabled recurrent HSV infection 1/2. Number of IL-1Ra in serum of infertile patients was 1.9 times less than fruitful.

Keywords: Herpes simplex, antagonist receptor of interleukin-1, infertility

1. Introduction

Nowadays the infection of herpes simplex is one of the most studied virus infections, but is still not clarified the impact of recurrent forms of reproductive function. Numerous clinical observations data say that herpes diseases of the genitourinary system lead to chronic inflammation of the urogenital tract, which in turn affects the reproductive health of women and men and can be a factor in the formation of male and female infertility [1, 2, 3].

There is growing evidence that viral infections play a role in the pathogenesis of infertility [1, 4]. Established that the herpes infection is a factor reducing the reproductive opportunities, both female and male body fertile age [5]. In carriers of the herpes virus fertility is reduced by almost half. Infections reduce fertility through various mechanisms. Of great interest to researchers is the proinflammatory cytokines - interleukin-1 (IL-1), which mediates a wide range of biological and physiological effects and plays an important role in the inflammation and the formation of protective reactions, especially in chronic infections [6]. Functional response of cells to the action of the neurotransmitter is possible only if the expression of specific membrane receptors IL-1 (IL-1R1, IL-1R2) on the surface of cells "targets". The study of the immune status of patients with recurrent herpes simplex 1 and type 2 (HSV 1/2) showed increase of receptor antagonist IL-1 (IL-1RA), which is synthesized by many cells, including monocytes, macrophages, neutrophils, Sertoli's cells, hepatocytes, adipocytes, synovial fibroblasts, mast cells, cells of the pancreas and intestinal epithelium [7].

IL-1Ra is an important physiological regulator of the expression of IL-1 and acts as inhibitor. It was established that the balance between IL-1 and IL-1Ra is important in the development of autoimmune process and in protecting the body from infection. [8] Binding of IL-1 receptor antagonist prevents the activation of intracellular signaling cascade of proinflammatory cytokines, reducing inflammation. [9]. If uncontrolled inflammatory response level of IL-1Ra insufficient to regulate the activity of IL-1.

The absence or low content of IL-1Ra plays a key role in the pathogenesis of a variety of diseases. [8] The maximum increase of IL-1Ra observed in infectious diseases and may be a sign of chronic inflammation [9, 10]. There are reports that in patients with recurrent HSV 1/2 increasing number of IL-1RA [2].

Study of IL-1RA activated in patients with recurrent HSV infection and infertility 1/2 will result in important information about the mechanisms of immune inflammation in this disease, to justify its approach to immunotherapy and to assess the impact of HSV 1/2 reproductive function of patients.

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The aim was to study the characteristics of synthesis of proinflammatory cytokines - IL-1Ra activated in patients with recurrent HSV infection and infertility 1/2.

2. Materials Methods

A prospective study of 120 patients aged 35 years - over 50 years, enabled recurrent infection with HSV 1/2, which passed examination at Lviv Regional Medical Center of Clinical Immunology and Allergology and Lviv regional center of reproductive health. All patients surveyed were divided by HSV 1/2 reproductive ability: among them were 63 fertile and 57 infertile. The control group consisted of 20 healthy individuals of similar age. The criteria for inclusion in the control group were: lack of symptoms and manifestations of herpes infection for at least the last year; lack of acute infections for at least 1 month before the date of blood collection; lack of chronic inflammatory and autoimmune diseases.

The diagnosis is established taking into account the complex clinical examinations and general laboratory, instrumental, immunological (based protocol), molecular genetic studies and confirmed the detection of serum specific serological markers of HSV, IgM (positive) and IgG (higher than 5 times the norm) and HSV 1/2 DNA in clinical specimens (saliva, scraping place of destruction, blood).

Determination of IL-1Ra in serum performed using ELISA method using enzyme immunoassay analyzer Sunrise (Austria). Test systems for determining IL-1Ra were standard reagent kits "Vector-Best" (Russia).

Clinical and pathological forms of HSV 1/2 flow determined under generally accepted in clinical practice criteria (ICD-10). Statistical analysis of the results of research carried out using standard methods of variation statistics using statistical software package "Excel-2002" i "STATISTIKA for Windows" (Statsoft Ins, USA) [11].

3. Results and Discussion

The study features the synthesis of IL-1Ra in serum of patients (fertile and infertile) enabled recurrent HSV infection 1/2 showed marked reduction of proinflammatory cytokines - IL-1Ra to 384.4 pg / ml, which level of control was 619.5 pg / ml ($p < 0.001$; Fig. 1), and the ways that inhibits binding of IL-1 α and IL-1 β with the respective cellular receptors. The results indicate a marked and poorly controlled inflammation in the body and prolific infertile patients with recurrent HSV infection 1/2, indicating a failure to resist viral aggression.

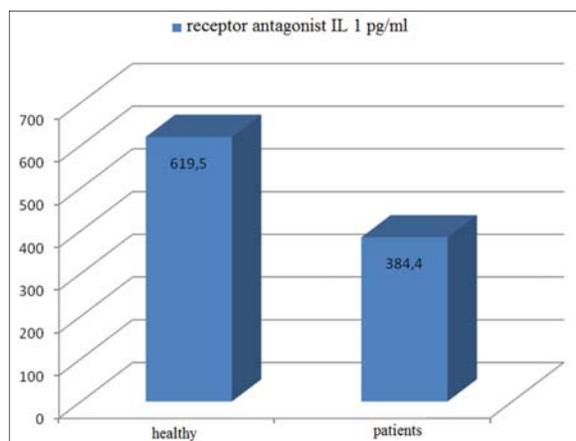


Fig 1: The concentration of IL-1Ra in serum healthy and patients with an activated recurrent infection of HSV 1/2 and infertility

Fertile and infertile patients with an activated recurrent HSV infection 1/2 significantly differ among themselves ($p < 0.001$) by the number of IL-1Ra serum level which was almost 2 times lower in infertile and was 224.4 pg / ml 445.2 pg / ml in prolific (Fig. 2). Deficiency of inflammatory cytokines - IL-1Ra in patients with relapsed activated by infection with HSV 1/2, which is particularly pronounced in infertile patients helps create pockets of chronic inflammation, which is associated with the formation of male and female infertility.

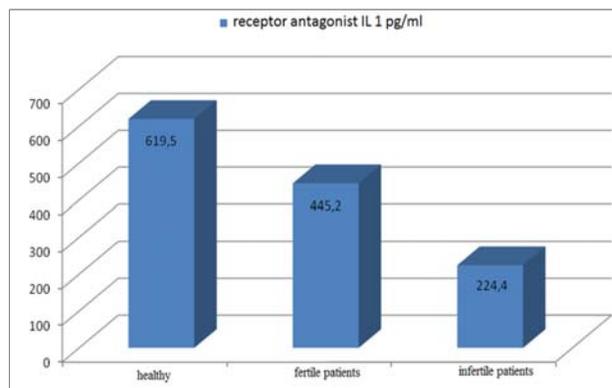


Fig 2: The concentration of IL-1Ra in serum of healthy, fertile and infertile patients with an activated recurrent infection of HSV 1/2

4. Conclusions

In the body, fertile and infertile patients with recurrent HSV infection 1/2 there expressed and poorly controlled inflammation, as indicated by reduced levels of IL-1Ra in the serum of these patients.

In infertile patients with recurrent HSV infection 1/2 the number of IL-1Ra serum in 2.1 times less than fertile, which contributes to pockets of chronic inflammation, which is associated with fertility.

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