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PROGNOSTIC VALUE OF CYTOKINES IN HPV-ASSOCIATED CERVICAL DISEASES IN WOMEN

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Objective: to evaluate the prognostic significance of immunological parameters in HPV-associated cervical diseases of the cervix in women of childbearing age.
Materials and methods: The study included 31 patients and 30 healthy women of childbearing age. All of them underwent clinical, biochemical, immunological, virological, laboratory and functional studies. Blood biochemistry (CRP, PTI, INR, APTT, glucose, urea); Immunological studies (monocyte chemotactic protein-1 (MCP-1), IL-2, IL-13); Statistical method (mathematical analysis and correlation).
Results: A reliable decrease in PTI to 85.47±1.14%, versus control - 97.77±1.19% and an increase in INR to 1.37±0.01, versus control values - 1.09±0.02 were revealed. A decrease in PTI against the background of normal fibrinogen with a tendency to increase in patients indicates the stage of the disease. At the same time, an imbalance with the probability of developing DIC syndrome was also established, which shows a simultaneous decrease in both PTI and PTV with statistical significance to 85.47±1.14% and 12.1±0.09% versus the control - 97.77±1.19% and 13.32±0.15%, respectively. An increase in the level of IL-6 by 4.6 times (up to 70.09±2.56 pg / ml), TNFa - by 7.0 times, TGF-β2 - by 117.7 times and VEGF by 2.95 times compared to the control (15.20±0.77 pg / ml) was established. Consequently, against the background of a decrease in protective reparative processes of vascular wall restoration, a high risk of stimulation of cell growth and proliferation is noted. MCP1 in HPV-associated cervical pathology in women is increased by 1.16 times, and IL-2- has a tendency to decrease.
Discussion: The prognostic value of cytokines in HPV-associated cervical diseases is an important area of research in understanding the immunologic response to the infection and its potential progression to malignancy. Human papillomavirus (HPV) infection is the primary cause of cervical cancer, and while many HPV infections are cleared by the immune system, persistent infection with high-risk HPV strains can lead to precancerous lesions and eventually cervical cancer.

Cytokines are signaling proteins that play crucial roles in regulating the immune response, and their expression in response to HPV infection can offer valuable insights into disease prognosis. Here are key aspects to discuss regarding the prognostic value of cytokines in HPV-associated cervical diseases:

1. Role of Cytokines in HPV Infection

- HPV infection induces a complex immune response involving both innate and adaptive immunity. Cytokines like interferons, interleukins, and tumor necrosis factor (TNF) are key regulators in this process.
- **Interferons (IFNs)**, especially IFN-alpha, have antiviral properties and play a critical role in the clearance of HPV infection. An impaired interferon response could lead to persistent infection.
- **Th1/Th2 cytokine balance**: The balance between pro-inflammatory Th1 cytokines (like IL-2, IFN-γ) and anti-inflammatory Th2 cytokines (like IL-4, IL-10) can influence the progression from an initial HPV infection to more severe cervical lesions. Th1 responses are typically associated with viral clearance, while Th2 responses can be linked to persistence and potential progression to cancer.

2. Cytokines as Biomarkers for Disease Progression

- Studies have identified that certain cytokines might correlate with disease progression. Elevated levels of pro-inflammatory cytokines such as IL-6, IL-8, and TNF-α have been associated with the presence of high-grade cervical lesions and HPV-associated cancers.
- **IL-6** is particularly noteworthy because it can induce angiogenesis and promote tumor growth. In high-risk HPV infections, IL-6 secretion may contribute to the development of cervical cancer by facilitating chronic inflammation.
- **IL-8**, another pro-inflammatory cytokine, has been linked to increased cell migration and invasion, which are critical steps in cancer metastasis. Elevated IL-8 levels have been observed in patients with cervical cancer or high-grade dysplasia.

In summary, cytokines play a critical role in both the immune response to HPV infection and in the progression of HPV-associated cervical diseases. Their levels and profiles may serve as valuable biomarkers for assessing disease risk and prognosis. Ongoing research is needed to further understand the specific cytokines involved in HPV pathogenesis and their potential for use in diagnostic and therapeutic applications. The ability to manipulate cytokine responses could lead to novel interventions that either boost the immune response or prevent immune evasion by HPV, ultimately reducing the burden of cervical cancer.

Conclusion: All the obtained data show the state of impaired regulation of synthesis, release and transformation of cytokines and protein growth factors in HPV-associated cervical pathology in women. In HPV-associated cervical pathology in women, a high risk of developing DIC syndrome is established. Therefore, it is important to take into account the coagulogram when managing patients of this category and the dynamic analysis of protein growth factors and IL-6 in the blood, which allows preventing oncotransformation of inflammatory diseases of the pelvic organs in women of childbearing age.