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Endocrine Cancer

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Abstract: This article discusses the endocrine glands studied by endocrinology. This is the name of a relatively young field of medicine that studies the human endocrine system and its possible pathologies. Unfortunately, oncological diseases - malignant tumors caused by atypical proliferation of glandular cellular tissue – are increasingly in the field of view of endocrinologists. Difficulties in their timely diagnosis are associated with the asymptomatic course of the first stages of the disease. Therefore, it is important not to forget about undergoing preventive medical examinations and carefully monitor your health by contacting a doctor at the first signs of malaise.

Key words: cell, tumor, atypical, health, asymptomatic.

Introduction: Despite advances in early diagnosis and various types of therapeutic interventions, cervical cancer (CC) continues to be one of the most common malignant neoplasms; it ranks fifth in the structure of cancer incidence in the world.

In Russia, cervical cancer ranks second, after uterine cancer. Standardized incidence rate of cervical cancer in 2008. in the Russian Federation amounted to 10.8%oo with fluctuations from 6.2-6.4 in Chuvashia and the Murmansk region to 23.9-26.6 in the Pskov and Altai Republics, the mortality rate -5.2%ooo (Prilepskaya V. N., 2008; Davydov M.I. et al. 2009; Chissov V.I. et al. 2010).

CC is most often detected at the age of 40-60 years (Chissov V.I. et al. 2010; Peterson F. et al., 1991; WHO, 2004). In patients under 35 years of age, the incidence of this neoplasm is 1.6-10%.

Particular attention should be paid to the increasing incidence of cervical cancer in young women (Glark M. A., 1991; Fischer V. et al., 2001; Meijer C. J. et al., 2009). The prevalence of this disease among young people (up to 39) has reached 20% of the total number of cases in recent years. At the same time, 4.8% of patients are aged 29 years or younger. In recent decades, against the background of a decrease in the incidence of cervical cancer in most age groups, in young Russian women it has increased by an average of 2% (Vasilieva Yu.L., 1998; Korolev B.C. et al., 1999; WHO, 2004).

Analysis of some factors that characterize the characteristics of the tumor and the body and can play a role in the pathogenesis of the disease suggests that patients with cervical cancer represent a heterogeneous group. In the etiopathogenesis of cervical cancer, the leading role is traditionally assigned to exogenous factors (Bohman Ya.V. et al., 1991; IARC, 2007; Ayhan A. et al., 2009).

Statistically significant risk factors for the cervix are recognized as early onset of sexual activity, early age at first pregnancy, trauma and inflammation of the cervix, a significant number of sexual partners, the presence or absence of circumcision (probable carcinogenicity of sperm), socio-economic factors (upbringing and education), poor sexual hygiene, infection with papilloma

viruses (HPV), herpes-2 (HSV), immunodeficiency virus (HIV) (Kozachenko V.P., 2008; Ashrafyan L.A. et al. 2007,2008,2009; Waggoner S.E, 2003; Schiffman M. et al. 2007)

The occurrence and progression of cervical cancer is mainly associated with a sexually transmitted viral infection; up to 95% of patients with cervical cancer were previously infected with the human papillomavirus (Rogovskaya S.I. 2008; Tong S. et al 2007; Branca M. et al 2008), in 81% of cases, high titer antibodies to HPV-2 were detected in the serum of patients with cervical cancer. The pronounced antitumor effect of interferon on cervical cancer in the form of a decrease in the number of atypical cells once again emphasizes the importance of the virus in the development of this pathology (Pelevina I. I et al. 1989; Barton A, 1996; Ferlay J et al., 2010).

However, throughout life, simultaneous association of exogenous factors occurs (Maksimov S.Ya. et al., 1997; Ashrafyan JI.A. et al. 2009; IARC, 2007). At the same time, exogenous factors are able to influence the body's systems in such a way that the endocrine mechanisms of carcinogenesis are triggered. Some authors (Berstein JI.M., 2000; Churuskaeva O.N. and coaBT.2010; Ricciardi A et al.2009) distinguish two types of hormonal carcinogenesis: promoter and genotoxic. Promoters of carcinogenesis promote the growth of already emerging single tumor cells. In the genotoxic variant, hormones or their metabolic products behave like true carcinogens. The risk of converting a promoter variant into a genotoxic one increases when an enhanced hormonal signal is superimposed on the influence of certain environmental factors (for example, tobacco smoke) and on special periods of ontogenesis that contribute to the formation of the so-called “edge effects” of hormones (Bershtein JI.M., 2000).

V.V. Kuznetsov (1991) argues that in patients with cervical cancer a special mechanism of endocrine homeostasis is formed, expressed in relative hyperprolactinemia, especially manifested in postmenopause and combined with a moderate decrease in gonadotropic activity, as well as a moderate increase in the functional activity of the thyroid gland.

In recent years, it has been proven that in the development of hyperplastic processes, a significant role is played by disruption of the metabolism of sex hormones, a shift in the ratio between their individual fractions (Kisilev V.I., Lyashenko A.A., 2005). In this regard, special attention is paid to the state of equilibrium between two estrone metabolites: 1 ba-OH-estrone and 2a-OH-estrone (Kisilev V.I. et al. 2004, 2006). One of them (1 ba-OH-estrone) is a proon-cogene, while 2a-OH-estrone has an antitumor effect (Berstein L.M., 2000).

It is possible that an imbalance between other metabolites of steroid hormones not only of the estrogen series, but also androgens, progestins, and glucocorticoids may play a certain role in the formation and development of the tumor process in the reproductive organs, including in the endothelial tissues of the cervix, which , as shown by some researchers, refers to hormone-dependent organs (Dilman V.M., 1983; Andreeva E.H. et al., 2006)

Cyclic changes in the cervix associated with the menstrual cycle, endocrine disorders in cervical cancer noted by clinicians, the possibility of modeling this pathology using estrogens in experiments, the isolation of steroid hormone receptors from tumor tissue of the cervix leave no doubt that hormones of the reproductive system play a certain role in the development of cervical cancer. Among the disorders of hormone sensitivity, changes in quantitative and qualitative nature, as well as their combinations, can be distinguished. They can be expressed by shifts in the number of receptor molecules, in their spatial configuration, features of coupling with a significant number of post-receptor mechanisms, etc. (Berstein JI.M., 2000; Bokhman Y.V., 2002). It also turned out that with prolonged estrogen deprivation, estrogen receptors change qualitatively, becoming more sensitive to estrogens, while at the same time providing selective activation of certain genes (Andreeva E.H. et al., 2006; Stoler M.N., 2000).

Studies of sex hormones in patients with cervical cancer are of particular value in the light of new data obtained by Arends MJ. et al. (1998), about the connection of the human papillomavirus with steroid hormones (Sterk P. et al. 2000). These data indicate that estradiol and its metabolite, 16-hydroxyestrone, is capable of increasing the expression of human papilloma (HPV), and 2-hydroxyestrone cancels the increase in the expression of oncogenes (Vikhlyaeva E.M., 2006; Andreeva E.H. et al., 2006; Churuskaeva O.N. et al. 2010; Fonseca-Montinho J.F.M. et al., 2002).

The presence of HPV in the body is accompanied by a decrease in the cell's ability to produce suppressor proteins, primarily the p53 suppressor gene, which can stop unregulated growth. Mutations of p53, stimulated by the HPV virus, with the support of sex hormones, lead to the fact that the protein loses the ability to perform its suppressive function. Mutations of p53 have been found in many malignant tumors, including malignant tumors of the cervix (Ashrafyan L.A. et al. 2008, Castellsague X. et al., 2002).

Thus, among the various conditions that predispose cervical tissue to malignant growth, changes in metabolism, primarily of sex steroids, occupy a very important place.

In this connection, studying the endocrine-metabolic status of patients for the purpose of theoretical and practical development, prevention, treatment and prediction of this disease is currently an urgent need.

Considering this problem comprehensively, we have not found similar analogues in literary sources. Information information reflects only specific issues of this medical problem and is presented with separate brief scientific facts.

Determination of hormonal characteristics in comparison with traditional clinical and morphological signs of cervical cancer before treatment and at all stages of treatment will make it possible to determine the significance of changes in the endocrine-metabolic status in the development and course of cervical cancer and individually predict the outcome of the disease.

All of the above determined the purpose and objectives of our research.

The set goal was achieved by solving the following tasks:

1. Conduct a comprehensive study of the endocrine-metabolic status of patients with cervical cancer before treatment;
2. Give a comprehensive assessment of indicators characterizing age-related characteristics of hormonal status, the influence of the stage of the tumor process on the specificity and intensity of metabolism of steroid hormones of the glucocorticoid, thyroid, androgen and estrogen series;
3. To study hormonal changes in patients with cervical cancer under the influence of neoadjuvant chemotherapy;
4. To determine the specifics of changes in hormonal balance after the surgical stage of treatment in patients with cervical cancer of different age groups;
5. To study the endocrine-metabolic status during radiation therapy;
6. To compare the features of the endocrine status of patients with cervical cancer with early recurrence of the disease and stable remission to determine hormonal criteria for the effectiveness of treatment and prognosis of the disease.

Materials and research methods

A comparative analysis of clinical and laboratory material for stage I cervical cancer was carried out (main group - 605 women: patients under 45 years old - 355 people; patients over 45 years old - 250 people) before and after combined and complex exposure in the clinics of the Russian Research Institute from 1995-2005. , taking into account the characteristics of the endocrine-metabolic status, the age of the patients, somatic pathology, and the prevalence of the tumor process.

The comparison group was healthy women (200 people, respectively: under 45 years old - 120, after 45 years old - 80).

Laboratory examinations were carried out: in hormonal, biochemical, morphological laboratories, ultrasound and radionuclide diagnostic methods laboratories, additionally epidemiological data were used.

The following research methods were used in the work: biochemical - determination of hormones in daily urine:

- total and free amount of 17-OX - method of R. Silber, S. Porter (1954) modified by M.A. Krekhova (1961);
- cortisol - F, tetrahydrocortisol - THF, tetrahydrocortisone -THE - O. Adames method modified by K.V. Druzhinina (1965);
-17-KS - total amount and their fractions: dehydroepiandrosterone - DEA, androsterone - A, etiocholanolone - Eth, 11-hydroxylated 17-KS - 11-OH-17-OX - Dingemans method (1952) modified by S.P. Zelinsky (1962);
- estrogens: estrone - Eb estradiol - Eg, estriol - Ez - by the method of J. Brown (1955) modified by O.N. Savchenko and G.S. Stepanova; radioimmunoassay methods:
- determination of total triiodothyronine - T3, total thyroxine - T4, TSH, cortisol, ACTH, FSH, LH in the blood - radioactivity was counted on gamma counters of imported and domestic production (Ultragamma 1280 (LKB, Wallas), Gamma-800, diagnostic kits were used companies "Cis-Bio International", "Cis-Ire Sorin" (France).

Data processing was carried out using medical and statistical research methods using Student's t test and nonparametric statistical methods (Wilconson-Money-Whitney). Differences were considered statistically significant at $p<0.05$.

Material and methods: The purpose of our work was to determine the state of the endocrine-metabolic status in patients with cervical cancer before treatment and at the stages of complex therapy and to establish prognostic criteria for the effectiveness of treatment and the outcome of the disease.

Results and discussion: The results of our work indicate that the majority of patients with cervical cancer have deviations from the norm in the processes of synthesis and metabolism of hormones of the pituitary-adrenal, pituitary-gonadal, pituitary-thyroid systems in all links: the regulation link, the synthesis link , a part of metabolism in the periphery. At the same time, the nature of the disturbance, the balance of hormones in patients of reproductive age differs significantly from that in patients who are in menopause.

Conclusion(s): In women of the reproductive period, despite hyperstimulation of the adrenal cortex by the adrenocorticotropic function of the pituitary gland, the malignant process appears and continues to develop with insufficiency of metabolically active cortisol. A large amount of it accumulates in the blood in deposited form, and the younger the patient, the more clearly these deviations from the norm appear. Menopausal patients are characterized by a state of hypercortisolism, accompanied by increased levels of cortisol already at the very beginning of the development of tumor growth.

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