

Peculiarity of Qualitative Changes of Prostate-Specific Antigen and Testosterone While the Cancer of Prostate in Various Age Groups

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ABSTRACT

We have researched the men ill with prostate cancer, the age of whom didn't exceed 70 years (19 cases) and the patients, the age of whom was more than 70 years (22 cases). The research was made before castration and after 6 months from the castration. On the basis of analyze of laboratorial data, it was made clear, that the concentration of testosterone, as well as the quantity of prostate-specific antigen was not much differ in different age groups. For example, in the plasma of blood of the patients under 70 years, concentration of testosterone was equal to $36,65 \pm 5,4$ nmol/L, and the concentration of prostate-specific antigen was $26,62 \pm 20,3$ ng/ml and in the blood of patients above 70 years these indices accordingly consisted of $36,4 \pm 2,2$ nmol/L (testosterone) and $31,42 \pm 10,3$ ng/ml. After castration, the indices of testosterone in the plasma of blood in the patients were reduced in both cases. In case of patients under 70 years, concentration of testosterone was reduced to $5,9 \pm 3,2$ nmol/L, and in the plasma of blood of the patients above 70 years to $6,42 \pm 2,2$ nmol/L. In spite of it, statistically reliable changing in the quantities of prostate-specific antigen was reduced to $17,38 \pm 1,33$ ng/ml and in the plasma of blood of patients over 70 years to $21,47 \pm 15,3$ ng/ml. Thus, from the gained data it makes clear, that the quantities of testosterone, as well as prostate-specific antigen don't differ in the blood of patients under and above 70 years. In both cases, castration causes the reducing of quantities of testosterone and prostate-specific antigen, but their changing was not found out to the age.

KEYWORDS: *prostate cancer, prostate-specific antigen, testosterone, age groups*

Cancer of prostate belongs to the number of much spread diseases, prophylaxis and treatment of this disease is one of the essential problems of the modern medicine.

The events of death caused by prostate cancer consist of 9% of death caused by all kind of cancer in men [2]. Prostate cancer is often androgen-sensitive and doesn't react on hormone therapy. This characteristic of prostate cancer strictly contemplates that steroid hormones, mainly androgens, play an important role in carcinogenesis of prostate of human being, but the exact mechanism, through the androgens make an influence on this process is unknown [3].

The treatment of prostate cancer mainly bears the paliatic character, essentially in the cases, if there are developed the metatheses in bone or soft tissues. Efficiency of treatment depends on the sensitiveness of epithelial cells of prostate gland to androgens, which are the inductors of proliferative activity of these cells. Anti-androgenic therapy or castration causes the remission of cancer for the certain time, but while progressing the cancer, when the situation depended on androgen changes for androgen-sensitiveness, than in hormone-refract oral or androgen-depended situation, process of androgen ablation becomes resultless [5,6]. There is expressed an opinion, that while this time, the receptor of testosterone existed under the influence of metastasis or in epical cells of prostate gland is under the mutation or amplification, because of which it constitutionally becomes active from the and requires only a little amount of testosterone [1,4,7,8].

It's doubtless, that in the development of prostate cancer, androgens play a leading part, but their meaning in the induction of neo and hyperplasic processes is not clear. Referring to it, it's interesting what kind of connection is in

the concentration of testosterone circulating in blood and initiation of disease, in their current situation and progressing is not known. It is not established, how far does the testosterone existed in blood correlate to the stages of diseases, to the beginning or developed forms of pathology.

Aim: Our aim was to study the qualitative changes of the cancer of prostate gland while prostate-specific antigen and testosterone in different age groups (in men under and above 70 years old); the above-mentioned research was carried out until and after the castration.

Material and methods of research – We have researched the concentrations of prostate-specific antigen and testosterone in the serum of blood. The above-mentioned data were divided into two groups:

1. The age of patients exceeded 70 years (22 cases)
2. The age of patient was less than 70 years (19 cases).

In the plasma of blood for defining of prostate-specific antigen there was used the immunofermant test-system of research (ELISA, TANDEM E) of Hyrbritesch.

Defining of testosterone was carried out by radioimmunological method. For fixing its quantity in the serum of blood, there was used the commercial test-system: P51-Testosteron RIA - mat Byh - Malin. Sensitiveness - 0,6 nmol/L, the ranges of defining 2-50 nmol/L in healthy men for the age of 20-80, the normal indices of testosterone ranges in 9-20 nmol/L.

Gained results - There were researched the men ill with prostate cancer by us the age of which didn't exceed 70 years and the patients, the age of which was more than 70 years. The researches were made before castration and after 6 months from castration. The gained results are presented in *Tab.1*.

Group	PSA until castration	Testosterone until castration	PSA after castration	Testosterone after castration
The age of patient was less than 70 years (n=19)	26.62±20.3 ng/ml	35.65±5.4 nmol/l	17.38±1.33 ng/ml	5.9±3.2 nmol/l
The age of patients exceeded 70 years (n=22)	31.42±10.3 ng/ml	36.4±2.2 nmol/l	21.47±15.3 ng/ml	6.42±2.2 nmol/l

Tab.1 Fixation of small intestine below the anastomosis, onto the cruces of middle joist. The final view of anastomosis. 1 - Esophagus. 2 - Anastomosis. 3 - Stitches fixing the small intestine on the cruces of the middle joist.

On the basis of analyze of laboratorial data, it was made clear, that the concentration of testosterone, as well as the quantity of prostate-specific antigen were not much differ from each other in different age groups. For example, concentration of testosterone in the plasma of blood in the patients under 70 years was equal to 36,65±5,4 nmol/L, and in the blood patients above 70 years, these indices accordingly consisted of 36,4±2,2 nmol/L (testosterone) and 31,42±10,3 ng/ml.

After the castration, in the plasma of blood of the patients, the indices of testosterone were reduced in both cases. In case of patients under 70 years, concentration of testosterone was reduced to 5,9±3,2 nmol/L, and in the plasma of blood of the patients above 70 years 6,42±2,2 nmol/L.

In spite of it, that there were not seen the statistically reliable changing in the quantities of prostate-specific antigen. In case of the patients under 70 years, concentration of prostate-specific antigen was reduced to 17,38±1,33 ng/ml and in the plasma of blood of patients above 70 years - to 21,47±15,3 ng/ml.

Thus, from the gained data, it's clear that the quantity of testosterone, as well as prostate-specific antigen doesn't differ in the blood of patients under and above 70 years. In both cases, castration causes the reducing of quantities of testosterone and prostate-specific antigen, their changing was not found out to the age.

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Особенность качественных изменений тестостерона и ПСА в разных возрастных группах при раке простаты

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РЕЗЮМЕ

Обследованы больные раком простаты в возрасте до 70 лет (19) и старше 70 лет (22) - до и спустя 6 месяцев после кастрации. Установлено, что концентрации тестостерона и ПСА незначительно отличались друг от друга в различных возрастных группах. Так, в плазме крови больных до 70 лет концентрация тестостерона составляет $35,65 \pm 5,4$ нмол/л, а ПСА - $26,62 \pm 20,3$ нг/мл. В плазме крови больных старше 70 лет эти показатели составляли, соответственно, $36,64 \pm 2,2$ нмол/л (тестостерон) и $31,42 \pm 10,3$ нг/мл (ПСА). После кастрации показатели тестостерона в плазме крови в обоих случаях снизились. У больных в возрасте до 70 лет концентрация тестостерона снизилась до $5,9 \pm 3,2$ нмол/л, а у больных старше 70 лет - до $6,42 \pm 2,2$ нмол/л. Однако статистически достоверные изменения содержания ПСА не обнаружены. У больных до 70 лет концентрация ПСА снизилась до $17,38 \pm 1,33$ нг/мл, а старше 70 лет - до $21,47 \pm 15,3$ нг/мл. Концентрации тестостерона и ПСА в плазме крови не отличаются друг от друга у больных до и старше 70 лет. Кастрация вызывает снижение уровня тестостерона и ПСА, но их связь с возрастом не выявлена.

КЛЮЧЕВЫЕ СЛОВА: рак простаты, ПСА, тестостерон, возрастные группы