CHANGES IN BLOOD PROTEIN AND ENZYME PARAMETERS IN MEN WITH PROSTATE DISEASES

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ИЗМЕНЕНИЯ БЕЛКОВОГО И ФЕРМЕНТНОГО ПАРАМЕТРОВ КРОВИ У МУЖЧИН ПРИ ЗАБОЛЕВАНИЯХ ПРЕДСТАТЕЛЬНОЙ ЖЕЛЕЗЫ

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Annotation. The article is devoted to identifying the characteristics of the dynamics of protein and enzyme metabolism in elderly patients with benign hyperplasia and malignant tumors of the prostate gland. Such diagnostically significant indicators of protein metabolism as creatinine, albumin concentration in blood serum and serum enzymes were determined.

Key words: protein and enzyme profile, prostate diseases, creatinine, alkaline phosphatase.

Аннотация. Статья посвящена выявлению особенностей динамики белкового и ферментного обмена у пожилых больных с доброкачественной гиперплазией и злокачественными образованиями предстательной железы. Определялись такие диагностически значимые показатели белкового обмена, как

креатинин, концентрация альбуминов в сыворотке крови и ферменты сыворотки крови.

Ключевые слова: белковый и ферментный профиль, заболевания предстательной железы, креатинин, щелочная фосфатаза.

Introduction. Benign prostatic hyperplasia is the most common benign tumor in men and is clearly associated with age. Clinical signs of this disease are observed in 10-15% of men aged 40 years and in 80% of men 75-80 years old. [1, 15].

The clinical picture of BPH is characterized by an undulating course and slow progression, accompanied by pronounced changes in all organs of the urinary system [3, 12].

Prostate cancer is a malignant neoplasm common in men over 50 years of age. In recent decades, the incidence of prostate cancer has increased worldwide, but the diagnosis of early stages of this disease has also improved [1, 8].

The main methods for diagnosing prostate cancer are digital examination of the prostate gland, determination of PSA levels, transabdominal or transrectal ultrasound and prostate biopsy [2, 7, 13].

Material and methods. The study material was the blood serum of patients of the urology department in men aged from 68 to 92 years. The total number of people examined was 52, of which 21 were patients with prostatic hyperplasia, 21 with malignant neoplasms of the prostate gland, 10 relatively healthy people were included in the control group.

Studies of protein metabolism indicators (total protein, albumins, globulins, urea, creatinine) and enzymatic activity of aspartate aminotransferase, alanine aminotransferase, alpha-amylase, alkaline phosphatase, creatine phosphokinase were carried out on a biochemical analyzer.

Results and discussion. During the study, patients were divided into two groups: group 1 – patients with benign prostatic hyperplasia; group 2 – patients with malignant neoplasms of the prostate gland. The control group consisted of relatively healthy people who underwent a preventive examination in this medical institution.

In patients with BPH, compared with healthy individuals, there is no significant decrease or increase in the concentration of total protein in the blood serum (70.4 ± 1.6 g/l for patients with BPH, 73.5 ± 1.5 g/l for the control group). Patients with PPI are characterized by a significant decrease in the concentration of total protein in the blood serum compared to the control group (67±2 g/l and 73.5±1.5 g/l, respectively). At the same time, there is a significant significant decrease in serum albumin in both the first and second groups (38.5±1.4 g/l and 37.1±1.4 g/l, respectively) compared to the control group (42.5±1 g/l). The concentration of globulins in the blood serum does not differ significantly from the values in the control (31±1.5 g/l) in the first group (32.0±1.2 g/l),

and in the second group a decrease in the content of globulins in the blood serum can be observed (29.9±1.4 g/l), which causes a decrease in the concentration of total protein, characteristic of this group of patients.

In the blood serum of patients, there is an increase in urea levels compared to the control group (5.1±0.7 mmol/l): for patients with BPH, the urea concentration was 8.8±2.2 mmol/l, for patients with PIPH - 13 .3±2.3 mmol/l (significant at p≥0.05). Also, both groups were characterized by a significant increase in the concentration of creatinine in the blood serum compared to the control group (141.5 ± 34.1 µmol/l for patients with BPH, 248.9 ± 51.3 µmol/l for patients with PVD and 84 .3±5.1 µmol/l for healthy individuals).

Based on the above, we can conclude that patients with BPH and VPI are characterized by a negative nitrogen balance with a decrease in the concentration of albumin in the blood serum, which may indicate sluggish pyelonephritis [3, p. 429]. A significant increase in the concentration of creatinine in the blood serum may indicate dilatation of the upper urinary tract and impaired renal function [3, 10, 11], and an increased concentration of urea may indicate increased breakdown of proteins. A number of authors consider creatinine to be a diagnostically significant indicator for these diseases, suggesting that this study can serve as an alternative to ultrasound of the upper urinary tract [1, 4, 9].

The activity of aspartate aminotransferase in the group of patients with BPH is 25±3.1 IU/l and does not significantly exceed that in the control group (22.8±3.1 IU/l), and the group of patients with BPH is characterized by an increase in AST activity to 38. 8±8.4 IU/l. The activity of alanine aminotransferase in both experimental groups does not differ from that in the control group (19±2.4 IU/l for patients with BPH, 28.8±5.9 IU/l for patients with PVD and 28.5±6.5 IU /l for healthy individuals) and is within normal limits.

Compared to healthy people, in patients with BPH and NPI, an increase in the activity of intracellular enzymes such as alpha-amylase and alkaline phosphatase (ALP) can be observed: alpha-amylase is characterized by an increase to 74.7 ± 24.4 IU/l in the first group, up to 57.4±8.6 IU/l in the second group (in the control group the activity was 49.2±4.8 IU/l); ALP is characterized by a significant increase in activity to 116.8±17.1 IU/l in the first group and to 105±10.1 IU/l in the second (compared to the control - 73.8±7.8 IU/l). Patients in both groups showed a significant increase in creatine phosphokinase activity in the blood compared to healthy people (38.5±10.9 IU/l in the control): 188±79 IU/l for the group of patients with BPH and 230±89.1 IU /l for the group of patients with PVD.

An increase in the activity of intracellular enzymes in the blood serum may indicate cell destruction and the release of these enzymes; it may also be a consequence of tumor development; it is assumed that an increase in the level of AST in the blood

serum may be a reflection of the syndrome of compression of surrounding tissues by an enlarged prostate gland [2, 6, 16].

Conclusions. Diagnostically significant indicators of protein metabolism are the concentration of albumin in the blood serum, increased concentrations of urea and creatinine caused by the breakdown of proteins and deterioration of kidney function; the most informative biochemical indicators of enzyme metabolism are the activity of alkaline phosphatase, AST, and CPK in the blood serum. It was found that both groups of patients were characterized by a significant decrease in the concentration of albumin, an increase in the concentration of urea, creatinine, AST activity, alpha-amylase, alkaline phosphatase and CPK. For group 2, a characteristic feature is a decrease in the level of total protein in the blood serum, caused by a decrease in the concentration of globulins, a significant increase in the concentration of creatinine and CPK.

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