

## **An Influence of Peptide Factors of Prostate Adenoma in Men on Morphological and Functional Condition of Prostate Gland of Experimental Rabbits**

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**Abstract:** In experimental conditions, an influence of intramuscular introducing of peptides, isolated from man prostate adenoma, was studied on 25 male rabbits. It was shown, that intramuscular introducing Fraction 1 to animals, to their tissue of prostate glands, during 15 days forms an intensive excrescence of connective tissue. In rabbits, which received Fraction 2, proliferation of glands' epithelium is formed. Maximal intensity of excrescent glandular tissue of prostate gland is observed on 10<sup>th</sup> day after finishing of 15-days introducing.

**Key words:** prostate gland peptides • male rabbits • prostate adenoma

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### **INTRODUCTION**

According to WHO's data, diseases of urogenital system in economically developed countries are on 4<sup>th</sup> place and make up 5-6% in structure of general disease incidence [1-2]. Urological diseases result in temporary and permanent loss of working ability and rehabilitation of such patients requires additional budgetary allocations [3-4]. Among urological diseases, urinary tract infections are on the first place, urolithiasis and benign hyperplasia of prostate gland (BHPG) are on the second place [5]. Increasing of men average life expectancy promotes growth of incidence rate of BHPG [6]. In the whole world it is given considerable attention to studying mechanisms of developing BHPG [7]. It is considered that, tumors of prostate glands (PG) with microscopic sizes are in 30% of men [8].

According to present conceptions, one of main reasons of forming BHPG are prostatitis [9], which are, by opinion of [10], are pathophysiological, morpho-functional basis of this pathology, because practically 100 % of men had in a past or prostatitis has been revealed in them during examination [11-12]. Morphologically, in case of prostatitis, forming of cysts in different parts of PG is detected. These cysts are connected between each other by inflammatory detritus and pus, which occlude

excretory ducts of segments of prostate gland, which are turning to closed focuses of hyperplasia [9]. Endocrine theory of genesis of tumors of PG is discussed in literature since 1884 and is most spread now. But up to this moment, a conception on mechanisms of forming BHPG is still uncertain. Currently, hyperplastic changes, adenomatous hyperplasia, atypical adenomatous hyperplasia and basal cell proliferation are related to this pathology [10]. In modern literature we did not find also works on studying an influence of humoral factors of adenomatous tissue of prostate gland on morphological and functional condition of PG of male rabbits in experimental conditions.

Objective of research was studying influence of humoral factors, isolated from adenomatous tissue of men prostate gland, on morpho-functional condition of prostate gland of male rabbits in experimental conditions.

### **MATERIALS AND METHODS**

During 2004-2006, 103 men, admitted to urology unit of Osh oblast combined clinical hospital, have been operated by us. Diagnostics of morphological shapes of BHPG was verified on a base of histological study. 2 peptide fractions have been isolated from adenomatous tissue by method of acetic acid extraction. Experiments are

carried out on 25 outbred male rabbits with weight of 2-3 kg. Studies of morpho-functional condition of PG were done before beginning of experiments (background), on 15<sup>th</sup> day of intramuscular introducing of 2 peptide fractions and on 10<sup>th</sup> day after finishing 15-days introducing. Peptide fractions have been intramuscularly introduced to animals 1 time in a day in a dose of 1 mg/kg of body mass during 15 days. Before introducing they were diluted by sterile physiological solution. For histological study we took PG from rabbits, which were placed after marking to 10% solution of formalin. After finishing each of experiments, G.A. Merkulov's stain by hematoxylin-eosin (1969) was done.

## RESULTS AND DISCUSSION

**Healthy Animals (Control):** Glands of prostate of healthy male of rabbit are lined with plasmatic epithelium with papillate excrescences, filled by optically transparent protein liquid with great content of proteins in the form of granules (Photomicrography 1). In such glands an epithelium is moderately packed and in a lumen there are "corpuscles", resembling amyloid. Stroma of PG is represented by connective tissue interlayers, consisting from reticular cells, collagen fibers and unstriated muscle cells. In isolated visual fields, seminiferous tubules are found with epithelial cells, nuclei of which are located in several lines and it gives the impression of multirowed epithelium.

**15-days of Introducing Fraction 1:** Glandular tissue of prostate is consisting from glands, which are lined with high cylindrical epithelium. In isolated visual fields, glands are highly stretched and epithelium of such glands is flattened. Empty glands may be found, but more often in a lumen protein transparent liquid is contained. Ratio between glandular tissue and stroma in various sites of PG is different, in some visual fields, glandular component is prevailing, in others – stromal one (Photomicrography 2).

**15<sup>th</sup> Day of Introducing Fraction 2:** In all visual fields of preparations, expressed proliferation of gland epithelium is noted. Epithelial glandular cells form papillae and crypt-like structures. Epithelium of glands is active and high. Nuclei in these epithelial cells are strongly basophilic. Stroma of glands is not equally expressed in various visual fields, in sites, where hyperplasia is ongoing, stroma is weakly expressed.

Accrescent cells of glandular epithelium penetrate to connective tissue stroma of PG. In all visual fields, the gland is presented by glandular structures on type of "adenoma". In lumen of glands there is protein content with isolated generative cells. Epithelium of glands is active and high. Blood vessels in stroma are without visible changes (Photomicrography 3).



Photomicrography 1: Prostate gland of healthy rabbit. Stain by hematoxylin-eosin. Magnification 40×8



Photomicrography 2: Prostate gland of rabbit on 15<sup>th</sup> day of introducing fraction 1. Stain by hematoxylin-eosin. Magnification 40×8



Photomicrography 3: Prostate gland of rabbit on 15<sup>th</sup> day of introducing fraction 2. Stain by hematoxylin-eosin. Magnification 40×8

**10<sup>th</sup> Day after Finishing 15-Days Introducing Fraction 1:**

In tissue of PG it is noted predominance of stroma, in which it was noted muscle fibers of collagen fibers with usual structure among irregularly thickened collagen fibers. Glandular tissue is not so much in prostate and it is inactive and decreased. There is no content in lumen of glands. Cells of glandular epithelium are low, nuclei in them are light. There are some visual fields, where glandular epithelium is located as islets among connective and muscle bulk. Glandular epithelium in these sites of prostate gland is single-row and consists of flattened cells with small light nuclei.

**10<sup>th</sup> Day after Finishing 15 Days Introducing Fraction 2:**

In the preparation, tissue of PG is represented with intensively accrescent glands with very fine and tender

stroma, which forms trabecules, papillae and crypt-like structures. Nuclei in cells of glandular epithelium are enlarged and located on different levels; this is creating an impression of multirowed epithelium. Basal membrane of glands is thin; there is protein content with different cells in cavities. There are mature spermatozoids among cells and more rarely – cellular fragments. Interglandular tissue is represented by connective tissue interlayers, where full blood vessels are located, in which sludge-phenomenon is expressed.

**CONCLUSION**

Thus, 15 days intramuscular introduction fraction 1 to tissue of PG of male rabbits forms intensive excrescence of connective tissue. In animals, which

received fraction 2, expressed proliferation of epithelium of glands is formed in tissue of PG. Here hyperplasia of connective tissue is weakly expressed. Maximal intensity of accrescent glandular tissue of PG is noted on 10<sup>th</sup> day after finishing 15 days introducing.

**Summary:** Peptides of adenoma are formed by intensive growth of connecting fabric and the expressed proliferation of an epithelium of glands.

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