МЕДИЦИНСКИ УНИВЕРСИТЕТ - ВАРНА
„Проф. д-р Параскев Стоянов“
Ул.“Марин Дринов“ 55, Варна 9002, България
Тел. : 052/ 65 00 57, Факс: 052/ 65 00 19
e-mail: uni@mu-varna.bg, www.mu-varna.bg

MEDICAL UNIVERSITY - VARNA
“Prof. Dr. Paraskev Stoyanov”
55, Marin Drinov Str., 9002 Varna, Bulgaria
Tel.: +359 52/ 65 00 57, Fax: + 359 52/ 65 00 19
e-mail: uni@mu-varna.bg, www.mu-varna.bg

Fund “Nauka” Project № 15006 Resume

“Correlations between vitamin D and androgens in benign and malignant prostate diseases”

Project leader: Prof. Bistra Galunska, PhD

Prostate diseases, benign or malignant, are among the most common diseases in the male population. It is estimated that one in three men over the age of 50 suffers from benign prostate hyperplasia, and among malignancies, prostate cancer is one of the most common in old age.

In recent years, a number of data have been accumulated on the role of the so-called modifying factors on the risk and progression of these common benign and malignant prostate diseases. Such modifying factors are diet and lifestyle, which largely determine the vitamin D status of the individual.

One of the functions of vitamin D is associated with its antiproliferative and pro-apoptotic effects on prostate cells. This makes it a potential antiproliferative and antitumor metabolite against various prostate diseases, including prostate cancer.

Another factor that plays an important role in the risk and progression of prostate cancer is the androgenic status. Understanding androgen metabolism is essential in the search for new therapeutic targets for prostate cancer. Androgens, such as steroid hormones, regulate a numerous biological functions in the prostate gland, including proliferation and growth of prostate epithelial cells. A number of studies have shown that an imbalance in androgen metabolism plays an important role in triggering and developing prostate cancer. The common metabolic link and the similarity in the regulatory mechanisms of vitamin D and androgens raise the question of the relationship between vitamin D and androgenogenesis in prostate cancer. A number of data from the literature suggest that on the one hand, serum levels of vitamin D are an important factor in androgen-mediated signaling, and on the other androgens activate the biosynthesis of calcitriol and its antiproliferative effects. In this sense, vitamin D and androgens play an important role both in maintaining normal metabolism in the prostate gland and in preventing the de-differentiation of prostate cancer cells

into a more aggressive phenotype. It can be expected that maintaining adequate levels of vitamin D and androgens would suppress the progression of prostate cancer, especially in patients in the early stages of the disease, and correction of vitamin D status within physiological limits could be an additional therapeutic approach in diseases, associated with testosterone deficiency, including prostate cancer.

The aim of the present study was to determine vitamin D and androgen status in men with benign prostate hyperplasia (BPH) and prostate cancer, and to examine the causal relationships between them and with indicators assessing the disease progression.

The study included 150 men with benign and malignant prostate disease with or without hypogonadism. Circulating levels of vitamin D, 25-hydroxy vitamin D (25OHD), to assess vitamin D status of participants, levels of androgens (total, free and bioactive testosterone, androstenedione, dehydroepiandrosterone, and serum sex hormone globulin) were studied. Seasonal variations 25OHD and androgens were investigated along with causal relationships with indicators of bone and mineral metabolism, anthropometric status, and progression and aggressiveness of the tumor process.

Vitamin D deficiency was established in patients with BPH and vitamin D deficiency in cancer patients. Deteriorated vitamin D status in patients with prostate cancer is exacerbated by the increased risk of biochemical recurrence and the aggressiveness of the tumor process. Moreover, the aggressiveness of the tumor process depends not only on the widely used risk factors such as age, body mass index, prostate specific antigen (PSA) and race, but also on the levels of circulating 25OHD. Significant decrease in testosterone levels with the increase of PSA, the risk of biochemical recurrence and the aggressiveness of the tumor process was found in prostate cancer patients. A positive relationship between the percentage of free testosterone and serum 25OHD was established. Prostate cancer aggressiveness is highly affected by elevated PSA values and decreased 25OHD levels. In addition, 25OHD showed highest diagnostic efficacy among studied steroids in differentiating patients with BPH from those with prostate cancer.