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Research Article

New Challenges for Prospective Effects of Well-Established Regimens of Treatment with Separate LHRH Agonists: What about Serum Testosterone Level and Disease Progression?

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Abstract

Introduction and Objective: Several modern urology clinics with known reputation in terms of prostate cancer treatment, are still fond of providing the patients with well-established regimens of treatment with LHRH agonists in cases of locally-advanced and metastatic prostate cancer. I aimed to investigate the prospective effects of treatment of locally advanced or metastatic prostate cancer with luteinising hormone-releasing hormone agonists (LHRH) on serum testosterone level and disease progression. It was a challenging question to find out which of the LHRH agonists decrease serum total testosterone to lower levels in men with locally advanced or metastatic prostate cancer and to determine whether being on a certain LHRH agonist (leuprolide acetate or goserelin acetate) for at least 6 months has a correlation with disease progression or not.

Materials and Methods: Concentration of serum total testosterone was measured in the same sera for measurement of serum total prostate specific antigen (PSA) level. 140 patients on leuprolide acetate and 155 patients on goserelin acetate were included. The mean ages of the patients were 74.14 ± 8.53 and 74.64 ± 8.45 in leuprolide group and goserelin group, respectively. The level of castration was accepted as 50 ng/dl.

Results: Concentration of serum total testosterone and serum PSA level were measured. The relation between the type of LHRH agonist used and the measured concentration of serum total testosterone was statistically significant (p = 0.008).

Disease progression was detected in 54 and 63 of the patients in leuprolide treatment group and goserelin treatment group, respectively (p = 0,446).

Conclusion: In our study, 94 patients, who had been diagnosed to have disease progression during follow-up, had a concentration of serum total testosterone less than 20 ng/dl and the remaining patients with disease progression had that of equal to or greater than 20 ng/dl. 160 of patients who had had no progression the concentration of serum total testosterone was measured less than 20 ng/dl (p = 0,091). No statistically significant association between spot concentration of serum total testosterone and progression in time during the treatment of locally advanced or metastatic prostate cancer with LHRH agonists. My study is essential since it has studied the concentration of serum total testosterone in randomly selected patients with prostate cancer within Turkish population.

Keywords: *Prostate Cancer; Cancer; LHRH Agonist; Metastatic; Locally Advanced; Testosterone*

Introduction and Objective

In today's world of innovation and technology, prostate cancer has still been one of the most conspicuous areas of investigation ever after. In the last decade, many milestones in treatment of patients with locally-advanced and metastatic prostate cancer have been successfully outreached. Owing to increasing number of incidence of prostate cancer in developing countries, distinguished methods of treatment are being encouraged, especially in metastatic form of disease. However, several modern urology clinics with known reputation in terms of prostate cancer treatment, are still fond of providing the patients with well-established regimens of treatment with luteinizing hormone-releasing hormone (LHRH) agonists in cases of locally-advanced and metastatic prostate cancer.

For the last three decades, the mostly preferred approach of treatment to locally advanced or metastatic prostate cancer has been the method of decreasing the level of circulating testosterone even to lowest levels, which is accepted as being under 20 ng/dl with luteinizing hormone-releasing hormone (LHRH) agonists. LHRH agonists cause a downregulation of LHRH receptors, leading to a remarkable reduction in the secretion of bioactive hormones stimulating testosterone production and a final status of "selective medical hypophysectomy" [1]. In this mode of treatment, the key point is a quicker acting, and rapidly solving agent for the situation have to be preferred. Thousands of patients with locally advanced and metastatic prostate cancer still continue to be prescribed with hormonal therapy with a remarkable sense of trust despite its well-known toxic prospective effects. A thorough understanding of the indications and potential benefits of this way of treatment is needed much more than ever after.

I aimed to investigate the prospective effects of treatment of locally advanced or metastatic prostate cancer with luteinising hormone-releasing hormone agonists (LHRH) on serum testosterone level and disease progression. It was a challenging question to find out which of the LHRH agonists decrease serum total testosterone to lower levels in men with locally advanced or metastatic prostate cancer and to determine whether being on a certain LHRH agonist (leuprolide acetate or goserelin acetate) for at least 6 months has a correlation with disease progression or not.

Materials and Methods

Patients with locally advanced and metastatic prostate cancer, who had been under LHRH agonist therapy for at least 6 months at the time of outpatient clinic visit were included in the study. The patients were included into two groups, using either goserelin or leuprolide acetate as LHRH agonists for treatment. 205 of the patients of both groups had been using the therapy for more than 3 years by the time of their inclusion to the study. Concentration of serum total testosterone was measured in the same sera, which was taken for measurement of serum total prostate specific antigen (PSA) level. 140 patients on leuprolide acetate and 155 patients on goserelin acetate were included in the study. The mean ages of the patients were 74.14 ± 8.53 and 74.64 ± 8.45 in leuprolide group and goserelin group, respectively. The level of castration was accepted as serum testosterone level being equal to or less than 50 ng/dl. As accepted in the study of Ostergren et.al. reaching the lowest achievable levels of testosterone delays disease progression and increases overall survival in men with advanced prostate cancer [2].

Results

Concentration of serum total testosterone was measured in order to determine the status of castration of the patients. The relation between the type of LHRH agonist used and the measured concentration of serum total testosterone was statistically significant (p = 0.008).

Disease progression was detected in 54 and 63 of the patients in leuprolide treatment group and goserelin treatment group, respectively (p = 0,446). In the study, 94 patients, who had been diagnosed to have disease progression during follow-up, had a concentration of serum total testosterone less than 20 ng/dl and the remaining patients with disease progression had that of equal to or greater than 20 ng/dl. For 160 of patients who had had no disease progression, the concentration of serum total testosterone was measured less than 20 ng/dl (p = 0,091). That parameter was statistically significant.

Discussion and Conclusion

As declared by Shiota., *et al.* serum testosterone level is a prognostic factor for survival in men with advanced prostate cancer [3]. Providing the level of castration during prostate cancer therapy has always been the milestone of treatment. This entity has drawn great attention during medical history as well as declared by Vis., *et al.* in their distinguished study [4]. In my study, I found that No statistically significant association was detected between spot concentration of serum total testosterone, measured and disease progression in time during the treatment of locally advanced or metastatic prostate cancer with LHRH agonists. My study is essential as a unique work of science since it has studied the concentration of serum total testosterone in randomly selected patients with prostate cancer within Turkish population.

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