

Preoperative serum levels of testosterone and dehydroepiandrosterone predict biochemical recurrence in high-risk prostate cancer

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Preda A.¹, Gingu C.², Ismail G.³, Dudu C.¹, Tarcomnicu I.⁴, Baston C.², Sinescu I.²

¹Fundeni Clinical Institute, Center of Urological Surgery and Renal Transplantation, Bucharest, Romania, ²University of Medicine and Pharmacy, Center of Urological Surgery and Renal Transplantation, Bucharest, Romania, ³University of Medicine and Pharmacy, Center of Internal Medicine-Nephrology, Bucharest, Romania, ⁴Cytogenomic Medical Laboratory, Department of Genomics, Bucharest, Romania

Introduction & Objectives: Although androgens play a key role in the development and progression of prostate cancer, data regarding the association of serum levels of various sex steroid hormones with increased risk of aggressive disease is controversial in the literature.

Objective: In this study, we investigate preoperative serum levels of sex hormones for the prediction of biochemical recurrence following radical prostatectomy for high-risk prostate cancer.

Materials & Methods: We performed a prospective analysis of 48 consecutive patients (mean age, 65.4+/-5.3 years) newly diagnosed with high risk prostate cancer and treated with radical prostatectomy in our institute between 2015 and 2017. Serum levels of free testosterone, dihydrotestosterone (DHT), dehydroepiandrosterone (DHEA), dehydroepiandrosterone sulphate (DHEAS) and androstenedione were analyzed using liquid chromatography-tandem mass spectrometry technique (LC-MS/MS). The primary endpoint of our study was biochemical recurrence (BR) defined as a serum PSA level greater than 0.2 ng/ml after surgery. Statistical analysis was performed using SPSS 13 for Windows (SPSS Inc., Chicago, Illinois) and Analyze-it™ (Analyze-it Software, Ltd., Leeds, UK).

Results: During follow-up, 26 (54.2%) patients developed BR: 15 (57.7%) at 1 month, 6 (23.1%) at 3 months, 2 (7.7%) at 6 months, 1 at 9 months (3.8%) and 2 at 12 months (7.7%). Lower serum level of testosterone and higher serum level of DHEA were associated with BR in follow-up compared with the group of patients in whom the outcome was not complicated by the occurrence of this event (3.5 ± 2.2 vs. 4.8 ± 2 , $p = 0.04$ and 4 ± 3.1 vs. 2 ± 1.9 ng/ml, $p = 0.005$). However, only the predictive value of the serum level of DHEA was significant in Cox regression analysis (HR, 1.15; 95% CI, 1.02 to 1.3; $p = 0.02$). The areas under the curve of the receiver operator characteristic curves were 0.73 (95% CI 0.58-0.85).

Conclusions: Our results revealed that newly diagnosed patients with high-risk prostate cancer and higher serum level of DHEA are at increased risk of BR. Moreover, our data highlights the importance of preoperative detection of serum level of hormone in the management of high-risk localized prostate cancer.