

The Management of Lower Urinary Tract Obstruction in Patients with Advanced Prostate Cancer

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Abstract: *Objectives:* To determine the optimal time to wait for urination ability restoration after urethral catheterization and anti – androgen treatment, in cases of acute urinary retention and advanced prostate cancer.

Methods: We enrolled 26 patients with histologically confirmed prostate cancer after transrectal ultrasound guided biopsy of the prostate and CT or MRI proven advanced stages (T3-T4). We evaluated the dynamic changes of the following factors; IPSS, QoL, Vmax, residual urine, serum concentration of PSA at the following periods; before hormonal treatment, 1, 3 and 6 months after hormonal treatment.

Results: How long we have to wait after urethral catheter insertion and hormonal treatment for voiding ability restoration?

Our data analyses revealed the answer to this question. The dynamic changes of all the parameters (IPSS, QoL, Vmax, PSA) we studied disclosed interesting regularity. The consequent comparative analyses of parameters showed statistically significant changes only 1 month after anti – androgen treatment. These changes indicate that the prostate cancerous process is significantly suppressed within 1 month after hormonal treatment and there is no point to wait more than 1 month.

Conclusion: Analyzing our data we obtained versatile evidence, that in advanced prostate cancer and acute urinary retention cases the optimal time to wait for sufficient voiding is 1 month period after permanent catheter insertion and anti – androgen treatment.

Keywords: Advanced prostate cancer, acute urinary retention, hormone treatment, transurethral resection, voiding restoration.

INTRODUCTION

In spite of scientific and technical progress, the detectability of organ confined prostate cancer is only 21%, and the remainder cases (79%) are diagnosed in locally advanced or metastatic stages (T3-T4) [1]. This condition is stipulated by several factors. The principal cause is that generally patients visit to doctors only in complicated cases such as; lower urinary tract obstruction, upper urinary tract obstruction, hematuria and other combined urologic disorders. Mostly (up to 43% of cases) we deal with lower urinary tract obstruction [2-4]. In cases of acute urinary retention permanent urethral catheter is inserted, and in suspicious situations after biopsy of the prostate and histological confirmation of diagnoses (prostate cancer) in cases of advanced prostate cancer generally hormonal treatment is performed. The literature data state the fact, that under the influence of anti – androgen treatment the prostatic cell apoptosis is activated [5, 6] and prostatic tissue diminishes [7, 8]. Several studies investigated the management of lower urinary tract obstruction in advanced prostate cancer

patients. The researchers revealed that after permanent urethral catheter insertion and anti – androgen treatment till 6 month period in majority of cases (up to 84%) the urination ability is restored [4, 9-11]. So, we can avoid of performing unnecessary transurethral resections of prostate. However in aforementioned situations the optimal time to wait for urination ability restoration is not defined yet.

METHODS

We enrolled 26 patients with histologically confirmed prostate cancer after transrectal ultrasound guided biopsy of the prostate and CT or MRI proven advanced stages (T3-T4). Oral informed consent was obtained from all patients before the study. All the patients underwent surgical or chemical castration. We have evaluated the dynamic changes of lower urinary tract symptoms (LUTS) with the help of subjective (International Prostate Symptom Score - IPSS, Quality of Life - QoL) and objective (Uroflowmetry) methods. IPSS, QoL questionnaire was filled up, uroflowmetry and residual urine measurement was performed before hormone therapy, as well as 1, 3 and 6 months after hormonal therapy. In order to evaluate the effectiveness of anti – androgen therapy we have measured the serum concentration of prostate specific antigen at the same periods of LUTS assessments.

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The obtained blood samples were centrifuged at 2000g for 10 minutes after allowing the blood to clot for 60 minutes at room temperature. After the serum was extracted for centrifugation, the samples were frozen immediately and stored at -20°C until use. The serum samples for PSA were thawed immediately before analysis. The PSA was determined using Microwell PSA EIA enzyme immunoassay (Syntron Bioresearch, Inc.). The serum PAP concentration was measured with kinetic method.

Statistical Analyses

The statistical package SPSS11 was used. The comparison of four related variables (separately for IPSS, QoL, maximal voiding velocity – Vmax, residual urine volume, serum PSA concentration respectively before hormonal therapy, 1, 3 and 6 months later after hormonal therapy) is done by using Wilcoxon Signed Ranks test.

Ethical Consideration

This study was approved by Ethics Committee of Yerevan State Medical University. All patients provided written informed consent.

The comparison of IPSS values (1, 3 and 6 months after hormonal treatment) with IPSS before the treatment showed (IPSS2 < IPSS1 (p=0.02), IPSS3 < IPSS1 (p=0.029), IPSS4 < IPSS1 (p=0.02)) statistically significant reduction of symptoms in all three periods after hormonal treatment, which is illustrated in Figure 1.

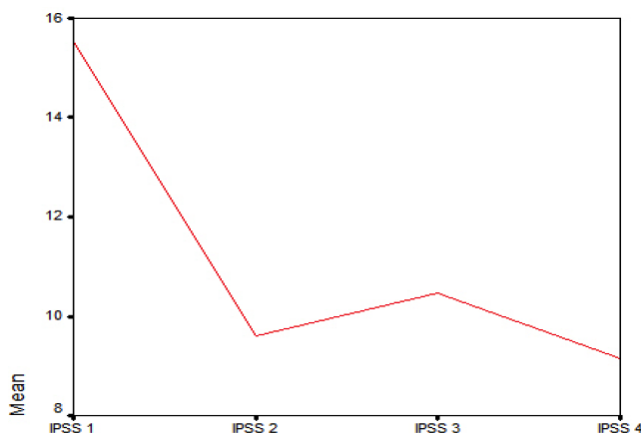


Figure 1: The dynamic changes of IPSS mean values after hormonal treatment. IPSS1 – IPSS mean value before the hormonal treatment, IPSS2, IPSS3, IPSS4 – IPSS values 1, 3 and 6 months after hormonal treatment respectively.

The comparison of IPSS parameters in consequent order showed (IPSS2 < IPSS1 (p=0.02), IPSS3 >

IPSS2 (p=0.628), IPSS4 < IPSS3 (p=0.755)), that IPSS changes are statistically significant only after 1 month of hormonal treatment. So analyzing our data we can conclude, that anti - androgen treatment in prostate cancer patients significantly decreases the lower urinary tract symptoms only 1 month after starting the treatment.

We also compared QoL parameters after hormonal treatment (1, 3 and 6 months later) with QoL before the treatment. Statistical analyses showed (QoL2 < QoL1 (p=0.039), QoL3 < QoL1 (p=0.149), QoL4 < QoL1 (p=0.056)) statistically significant increment of quality of life associated with lower urinary tract symptoms only 1 month after hormonal treatment. The consequent comparison of QoL parameters showed (QoL2 < QoL1 (p=0.039), QoL3 > QoL2 (p=0.426), IPSS4 < IPSS3 (p=0.317)) significant increment of QoL only 1 month after hormonal treatment, which is illustrated in Figure 2.

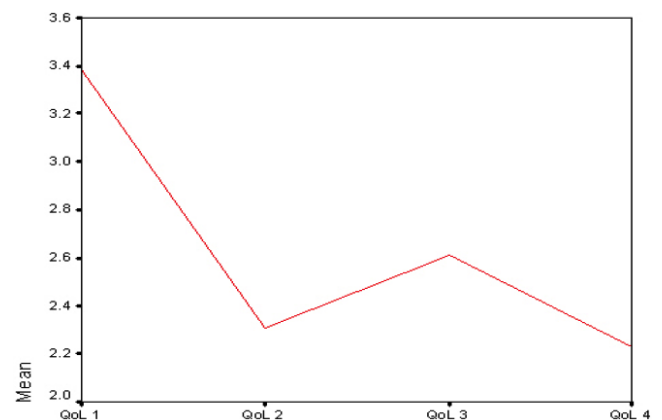


Figure 2: The dynamic changes of QoL mean values after hormonal treatment. QoL1 – QoL mean value before the hormonal treatment, QoL2, QoL3, QoL4 – QoL values 1, 3 and 6 months after hormonal treatment respectively.

The comparison of Vmax values after hormonal treatment (1, 3 and 6 months later) with Vmax before the treatment showed (Vmax2 > Vmax1 (p=0.005), Vmax3 > Vmax1 (p=0.006), Vmax4 > Vmax1 (p=0.015)) statistically significant increment of Vmax in all three periods after hormonal treatment, which is illustrated in Figure 3.

The consequent comparison of Vmax values (Vmax2 > Vmax1 (p=0.005), Vmax3 > Vmax2 (p=0.776), Vmax4 > Vmax3 (p=1.000)) showed statistically significant increment of maximal voiding velocity only 1 month after hormonal treatment.

The comparison of serum concentration of PSA after hormonal treatment (1, 3 and 6 months later) with

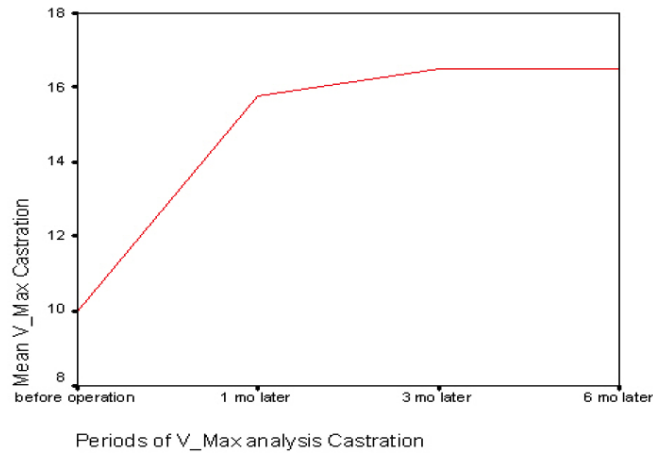


Figure 3: The dynamic changes of Vmax mean values after hormonal treatment. Vmax1 – Vmax mean value before the hormonal treatment, Vmax2, Vmax3, Vmax4 – Vmax values 1, 3 and 6 months after hormonal treatment respectively.

serum concentration of PSA before hormonal treatment revealed ($PSA_2 < PSA_1$ ($p=0.000$), $PSA_3 < PSA_1$ ($p=0.015$), $PSA_4 < PSA_1$ ($p=0.002$)) statistically significant reduction of PSA value in all periods after hormonal treatment. However the consequent comparison of PSA values showed ($PSA_2 < PSA_1$ ($p=0.000$), $PSA_3 > PSA_2$ ($p=0.195$), $PSA_4 < PSA_3$ ($p=0.11$)) statistically significant reduction of PSA value only 1 month after hormonal treatment (Figure 4).

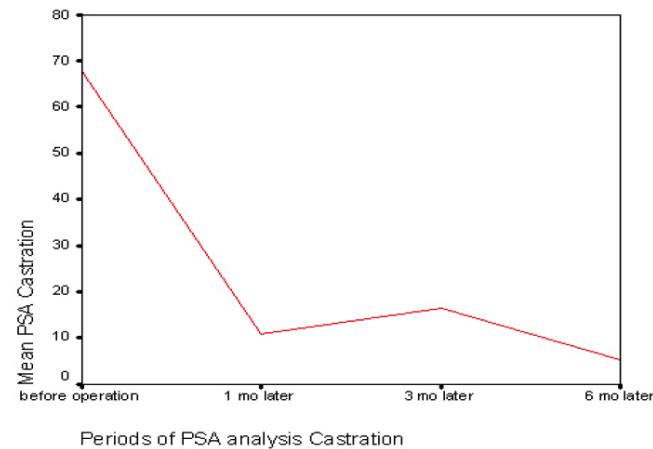


Figure 4: The dynamic changes of Vmax mean values after hormonal treatment. Vmax1 – Vmax mean value before the hormonal treatment, Vmax2, Vmax3, Vmax4 – Vmax values 1, 3 and 6 months after hormonal treatment respectively.

DISCUSSION

Review of the literature (hinari, pubmed databases) revealed few articles elucidating the influence of anti – androgen treatment on lower urinary tract symptoms in prostate cancer advanced stages. The researchers revealed that in prostate cancer advanced stages up to 43% of patients are complaining of lower urinary tract

obstruction symptoms [2-4]. It is proven, that in this situations permanent urethral catheter insertion and anti – androgen treatment in up to 84% of cases may restore urination ability in different periods of waiting. Success in relieving voiding dysfunction is not standardized after hormonal treatment, and various studies use different endpoints to define the same. Fleischmann and Catalona described success as a patient who can void satisfactorily within 60 days after orchiectomy, and in 72% of cases the patients were catheter free [9]. Varenhorst and Aalund study revealed that 6 months after orchiectomy the success rate of satisfactory voiding is 62% [11]. Sehgal and Mandhani data showed that 84% of patients 1 month after hormonal treatment were catheter free with satisfactory voiding [3]. In a study by Carpentier and Schroder, prostatic size decreased by a mean of 57% in the first 3 months of hormonal ablation. It was observed that the gland size was reduced to 50% in the first month, although prostate volume continued to decrease for 9 months [12]. The data obtained from abovementioned studies are controversial and none of them gives us the optimal solution. So, how long we have to wait after urethral catheter insertion and hormonal treatment for voiding ability restoration?

Our data analyses revealed the answer to this question. The dynamic changes of all the parameters (IPSS, QoL, Vmax, PSA) we studied disclosed interesting regularity. The consequent comparative analyses of parameters showed statistically significant changes only 1 month after anti – androgen treatment. These changes indicate that the prostate cancerous process is significantly suppressed within 1 month after hormonal treatment and there is no point to wait more than 1 month.

So, analyzing our data we obtained versatile evidence, that in advanced prostate cancer and acute urinary retention cases the optimal time to wait for sufficient voiding is 1 month period after permanent catheter insertion and anti – androgen treatment.

CONFLICT OF INTERESTS

None declared.

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