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ORIGINAL ARTICLE

Impact of Anxiety on Erectile Dysfunction After Transrectal Ultrasound-Guided Prostate Biopsy

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Abstract

Introduction: The aim of this study was to determine whether erectile dysfunction (ED) patients are under the effect of anxiety and analyze their results of transrectal ultrasound-guided prostate biopsy (TRUS-PB).

Methods: The study was conducted between April 2015 and February 2016, and the population consists of the patients clean from prostate cancer (PCa) according to the TRUS-PB results. ED or cancer patients were identified for exclusion as well as those with a history of biopsy or surgery on prostate site. The study group filled in the international index of erectile function-5 (IIEF-5) and the beck depression inventory (BDI) forms under the supervision of urologists. The timetable was like this: The two pre-biopsy forms with the 2nd or 3rd-week interval, the biopsy day following the second form, and the three post-biopsy forms in the 1st, 3rd, and 6th month.

Results: When completing the study process, the case number was a total of 131 patients with no PCa according to the biopsy results (Main Age: 60.14±5.49). For IIEF-5, the pre-biopsy statistics were 23.57±2.45 points on average (105 ED patients), and the post-biopsy ones got better from the fourth forms ($p<0.001$). The pre-biopsy scores of BDI increased in 94 patients and again their post-biopsy ones improved in the fourth forms ($p<0.001$).

Discussion and Conclusion: The process including follow-up in prostate examination has depressive risks in the patients who applied TRUS-PB along with ED.

Keywords: Anxiety; depression; erectile dysfunction; prostate cancer.

In diagnosis of prostate cancer (PCa), there has appeared a standardized process, called transrectal ultrasound-guided prostate needle biopsy (TRUS-PNB)[1]. TRUS-PNB is generally well tolerated with minor morbidity only rarely requiring treatment[2].

Nevertheless, the procedural risk is always possible that infection or sepsis, for example, can be seen in the post-biopsy phase[2]. Patients mostly have complaints regarding severe complications such as bleeding rectum, hematospermia, or hematuria[2,3]. Out of them, erectile dysfunction (ED) is noteworthy according to some evidence[4-7]. There are conflicting studies on the risk of ED after TRUS-PNB[8]. In the literature, its temporary effects can reduce to the baseline only at the end of 4–6 weeks[9] despite an exception of 8–10% of patients who had ED even 3 months after TRUS-PNB[4,5] or only one finding that ED can be observed until 6 months later[10].

In the literature, a number of pathogenetic factors have

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been reported due to PNB procedure. Anxiety may occur in patients undergoing PNB in concern with ED associated with hematoma or edema caused by the physical injury in the neurovascular bundle or nerve compression[4].

PNB causes not only ED-oriented anxiety but also depression of PCa possibility[11,12]. In a study of Macefield et al.,[13] the frequency of patients having anxiety was nearly 10% at PSA screening and increased to about 20% on the biopsy day, otherwise decreased in time due to negative results. After all, the literature review demonstrated that only reference has been made to the ED-related anxiety but not solid evidence, at least so far.

The aim of this study is to evaluate the development of post-PNB depression and ED. For this purpose, among the exclusion criteria were any could-be depressive reasons for ED in patients who underwent TRUS-PNB. Beck depression inventory (BDI) was virtually the first method used for this issue, and the responses of the study subjects with no PCa diagnosis on PNB were analyzed.

Materials and Methods

In this study, the retrospective review was applied using the prospective records. The present study protocol was reviewed and approved by the institutional review board of Bagcilar Training and Research Hospital (Date: 11.06.2015, Reg. No: 2015-387). A required approval was made by the official body in the institution, and within the period from April 2015 to February 2016, TRUS-BNP was applied to 368 patients in total whose PSA level unusually increased and/or digital rectal examination (DRE) had unsure results. According to the BNP data, 131 patients clean from PCa were included in the study to reveal ED due to anxiety after the PNB procedure. Patients with biopsy-proven PCa and patients with ED were excluded from the study.

For prophylactic therapy, anticoagulants were stopped and oral ciprofloxacin (500 mg) was administered twice per day and then interrupted 1 day before the biopsy and after undergoing PNB, resumed for 5 days. The periprostatic nerve block, an anesthetic technique, was used through the injection of 10 mL 2% prilocaine just 5 min before the application. The PNB procedures were made on prostate site in the left decubital position, and 10 or 12 biopsies were got using a core biopsy needle (18 gauge) with a transrectal probe (7.5 mHz; Hitachi, Tokyo, Japan).

No explanation was made about PCa or PSA risk while applying the first international index of erectile function-5 (IIEF-5) and BDI questionnaire forms to 368 patients before exclusion. The PNB was done just after the second forms filled out in the second or 3rd week. The selected patients have no cancer according to the pathology results, and 131 patients were begun to study 15 days later on the declaration day and then given BDI and IIEF-5 sheets to fill in 3 times, in the 1st, 3rd, and 6th month.

Patients assess 21 items in BDI on their own (12) and score the severity of depression from 0 to 3 per each. The depression level is minimal if the total grade is from the point of 0 to 11, mild of 12–19, moderate of 20–35, and severe of 36–63. IIEF-5 forms aim to assess whether ED is present and to what extent it is severe (13). The responses are given the scores from 0 to 5 and overall point below seven means severe ED, between eight and 16 mild ED, and above 21 no ED.

The statistical analysis was performed using SPSS V22.0, a software package. To observe the codistribution of PNB and ED data, the Wilcoxon signed rank test and Pearson correlations test were applied. Significance level was $p<0.05$.

Results

A total of 185 patients underwent biopsy during the study period. Thirty-six patients were excluded due to cancer diagnosis, five due to previous biopsy, and 13 due to baseline ED. The study group was 131 cancer-free patients. The final population had a mean age of 60.1±5.5 and a mean PSA of 5.7±2.3. Table 1 presents IIEF-5 score (23.57±2.45 on average) and BDI score (13.61±5.34 on average) up to the BNP explanation while there is a summary in Table 2 regarding the codistribution of depression and ED. It was found that the percentage of the patients with high BDI scores was 98.47% 1 day before the biopsy day. The pre-biopsy BDI scores increased from the first to the second form in 74 patients while the number of mild or severe ED patients was 105 individuals in pre-PNB biopsy.

As analyzed in Table 3, the fourth BDI forms had lower scores, whereas the IIEF scores were higher as a sign for improvement (for both, $p<0.001$). There was no statistically significant difference between IIEF scores at 6-month post-biopsy and IIEF scores before biopsy ($p>0.05$). The severe depressive patients were only 12 as can seen in the fifth and last forms 6 months after the procedure with three ED patients as presented in Table 4.

Table 1. Demographic data of the patients

	Mean±SD
Age (year)	60.1±5.50
PSA (ng/mL)	5.7±2.3
IIEF-5 score	23.57±2.45
BDI score	13.61±5.34

Table 2. The ratio and distribution between depression and erectile dysfunction before prostate biopsy

Depressive symptoms	No ED IIEF>21 (%)	Mild ED IIEF 16-21 (%)	Moderate ED IIEF 15-8 (%)	Severe ED IIEF<8 (%)	Total (%)
Minimal	0	1 (1.8)	1 (3)	0	2 (1.5)
Mild	14 (53.8)	17 (30.9)	3 (9.1)	3 (17.6)	37 (28.2)
Moderate	11 (42.3)	34 (61.8)	21 (63.6)	9 (52.9)	75 (57.3)
Severe	1 (3.8)	3 (5.5)	8 (24.2)	5 (29.4)	17 (13)

ED: Erectile dysfunction; IIEF-5: International index of erectile function-5.

Table 3. IIEF-5 and BDI scores of the patients during follow-up

	Before explaining PNB	Before PNB	1st month After PNB	3rd month After PNB	6th months After PNB	p
IIEF-5 score	23.57±2.45	12.70±4.81	14.72±4.67	18.93±3.92	21.95±3.60	<0.001[w]
BDI score	13.61±5.34	21.51±8.92	27.46±7.17	24.28±10.09	19.10±7.46	<0.001[w]

PNB: Prostate needle biopsy; IIEF-5: International index of erectile function-5; BDI: Beck depression inventory; [w]: Wilcoxon rank test.

Table 4. Sixth months after prostate biopsy

Depressive symptoms	No ED IIEF>21 (%)	Mild ED IIEF 21-16 (%)	Total (%)
Minimal	9 (7.4)	0 (0.0)	9 (6.9)
Mild	45 (36.9)	3 (33.3)	48 (36.6)
Moderate	59 (48.4)	3 (33.3)	62 (47.3)
Severe	9 (7.4)	3 (33.3)	12 (9.2)

ED: Erectile dysfunction; IIEF-5: International index of erectile function-5.

Discussion

Of the types of cancer, the most prevalent in advanced countries and the third frequent in killing men is PCa[14]. Furthermore, there is evidence regarding the association of recognizing the diagnosis of PCa with its psychological effects including mood swings, anxiety, and depressive symptoms[11,12]. PNB is performed when patients with LUTS symptoms (evaluated by IPSS)[15] have suspicious DRE and higher PSA. The PNB procedure should be considered with the thought of its would-be effects on anxiety and hence ED[16]. In literature, there are adequate number of studies on the interwoven effects of PNB diagnosis and ED-related anxiety, whereas there is ironically no exact evidence of post-biopsy ED-oriented anxiety, to the best of our knowledge. Our aim is to reveal the straight effect of a "psychological" disorder like anxiety occurring in individuals to undergo PNB just in concern with cancer risk, even with no real cancer, on a "physiological" complication like ED, using BDI.

ED and depression having interchanging roles are common comorbid conditions among men. There is an association between high scores of depression and frequency of moderate ED reports (Massachusetts Male Aging Study)[17]. There are many psychiatric problems in elderly individuals[18,19]. Likewise, patients often have depression. These individuals are seen in depression as well as in insomnia[20,21]. Depression in aging men, together with ED development, is a common occurrence[22,23]. In a study, the depressive rates increase as acute medical illnesses have greater numbers and levels[24]. Their complicated interrelationship blocks the precedence of depression and ED. Another cause of ED development is a lack of testosterone, which also causes depression[22,25].

According to Aktoz et al.,[26] the adverse effect of PNB is statistically significant on immediate erectile function. In the study of Akyol et al.,[9] it was shown that ED occurs for a while and ends 4–6 weeks later following the BNP. There is some evidence in literature that the rate of recurring ED 3 months later in the post-biopsy phase ranges merely from 8% to 10% of the patients[4,5]. Furthermore, the new data has revealed the likelihood of the interaction of ED and the quantity of recurrent biopsies. Fujita et al.[27] observed in a study that the greater number of biopsy procedures significantly correlated with the lower score in IIEF-5 forms, and

the cases diagnosed with PCa presented no anxiety. In our present study, we identified the ED condition for 6 months after the biopsy to leave out the factors of specific inflammation.

In a study, Zisman et al.[4] used non-validated questionnaire in 211 patients who underwent biopsies and reported that PNB and ED are related to pain and anxiety. In this study, 65 out of every hundred cancer patients had anxiety at a maximum level 1 week later before the pathology results were revealed, and restabilized 1 month later. The percentage of ED patients was constant at 15% from the 7th to 38th days following the biopsy. There is a possibility of the physical injury to the neurovascular bundle or nerve compression by hematoma or edema due to the procedural complications of BNP, rather than a psychological cause[4]. The patients who still had ED on the 30th day displayed more anxiety than the recovered ED patients. Chrisofos et al.[5] suggested that the acquired ED cannot be totally terminated even 3 months after the biopsy. In that study, it was discovered separately from Zisman that ED developed in individuals with no PCa. Thus, they argued that ED has no psychological causes.

The patients biopsied and diagnosed with PCa may have ED[28]. In addition, there is evidence that BNP has an effect on both anxiety and ED[4,16]. Macefield et al.[13] reported that anxiety is lowering once the patient is informed of adverse BNP results. In the study of Akbal et al.,[6] the PCa patients were excluded because cancer-oriented anxiety may distract from the real cause of ED. In this study, the data analysis of 74 biopsied patients revealed that 11.6% of patients had mild ED first in the third reports in the 1st month after the biopsy recovered till 6 months later according to the fifth forms. The present study has become one of the prolonged studies in the literature. The aim was to erase any symptoms of on-site inflammation and psychological disorder 6 months later at the end of the study process. In addition, we selected patients clean from cancer to eliminate the anxiety that can be triggered by cancer concerns for an objective evaluation. There are a number of limitations to this study. First, the number of patients was low. Second, lack of long-term follow-up results, and finally, lack of control group.

Conclusion

Psychologically and physiologically healthy individuals can be patients with anxiety and hence ED, simply due to the PNB procedure and the worry of its complications. Nevertheless, the scores of BDI and IIEF-5 are likely to improve as time goes by. The erectile function of the patients is recovering faster than their depression. The would-be complications should be pre-informed to the patients.

Ethics Committee Approval: The present study protocol was reviewed and approved by the institutional review board of Bagcilar Training and Research Hospital (Date: 11.06.2015, Reg. No: 2015-387).

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