

Anxiety level of early- and late-stage prostate cancer patients

Charles Johanes, Richard Arie Monoarfa, Raden Irawati Ismail¹, Rainy Umbas

Departments of Urology and ¹Psychiatry, Cipto Mangunkusumo Hospital, Faculty of Medicine University of Indonesia, Jakarta, Indonesia

Purpose: Anxiety can worsen prostate cancer patients' decision making and quality of life. Early identification of anxiety disorders is thus very important for excellent prostate cancer treatment. This study aimed to determine the levels of anxiety in patients with early-stage prostate cancer compared with advanced-stage disease.

Methods: This cross-sectional study was performed at the Department of Urology, 'Cipto Mangunkusumo' Hospital, Faculty of Medicine, University of Indonesia. The subjects were early-stage prostate cancer patients and advanced-stage prostate cancer patients with bone metastatic lesions proved by bone scan. Comparative analysis was done to analyze anxiety scores assessed by use of an 11-item modified Memorial Anxiety Scale for Prostate Cancer (MAX-PC) questionnaire. We also assessed the relationship of the MAX-PC score with age, prostate-specific antigen (PSA) value, number of bone metastases, and pain. Data were analyzed by using SPSS ver. 17 (SPSS Inc.).

Results: There were 34 subjects with early-stage prostate cancer and 34 subjects with advanced-stage prostate cancer. We found that the mean anxiety score was significantly lower ($P=0.0001$) in the early-stage prostate cancer group (8.32 ± 3.65) than in the advanced-stage prostate cancer group (12.61 ± 4.56). Nine subjects had a pathological MAX-PC score (≥ 16), of whom 1 subject had early-stage disease and 8 subjects had advanced-stage disease. Furthermore, there were significant positive correlations ($P < 0.001$) between MAX-PC score and visual analogue scale pain score ($r=0.633$), PSA value ($r=0.263$), and number of bone metastatic lesions ($r=0.464$). However, the correlation between age and anxiety score was not significant ($P=0.170$).

Conclusions: The MAX-PC anxiety score was significantly associated with the stage of prostate cancer. Furthermore, visual analogue scale pain score, PSA value, and number of bone metastatic lesions can also affect the MAX-PC anxiety score.

Keywords: Prostatic neoplasms, Neoplasm staging, Anxiety disorders, Pain measurement

INTRODUCTION

Prostate cancer is the most common carcinoma among men in Western countries, and the incidence rate is increasing in Asian countries [1]. Men diagnosed with prostate cancer have a higher anxiety level and a higher risk of developing depression than do healthy men [2]. They also have a tendency for suicide that is 4 times higher than the risk in healthy individuals [3]. Prostate cancer patients also experience serious challenges to their self-esteem [4,5], especially concerning

their masculinity [6,7]. Some of the unpleasant experiences that prostate cancer patients may have are the fear of bearing their unpredictable future [8]; pain; fatigue; nausea (due to medication); loss of social and physical capabilities, especially sexual capability, as the result of hormonal therapy [9]; and erectile dysfunction, which occurs in 30% to 70% of patients who undergo prostate surgery [10,11]. The patient's response to those unpleasant experiences may be a trigger of anxiety and depression in this population [12]. Anxiety and depression also affect the quality of life of patients with prostate

Corresponding author: Rainy Umbas

Division of Urology Department of Surgery, Cipto Mangunkusumo Hospital, Faculty of Medicine University of Indonesia, Jl. Diponegoro No.71, Jakarta 10430, Indonesia
E-mail: rainy.umbas@gmail.com / Tel: +62213923631 / Fax: +62213145592

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cancer, especially those receiving hormonal therapy [13]. Furthermore, anxiety and depression can worsen the patient’s decision making. For these reasons, early identification of affective disorders is very important for making good prostate cancer treatment decisions [4,14]. Unfortunately, only a few studies about quality of life and the psychological characteristics of prostate cancer patients have been conducted in Asia [15]. In general, those studies showed that the anxiety level of patients with cancer was proportional to the stage of the disease [16]. The aim of the present study was to determine the anxiety level of patients with early-stage prostate cancer compared with that of patients with advanced-stage disease at our institution.

MATERIALS AND METHODS

1. Patients

The subjects of this study were newly diagnosed patients with early-stage or advanced-stage prostate cancer registered in the Department of Urology, “Cipto Mangunkusumo” Hospital. Advanced-stage prostate cancer was defined as metastatic prostate cancer proved by bone scan. Exclusion criteria were subjects who could not communicate or fill out the anxiety or visual analogue scale (VAS) form.

2. Data collection

Subjects who met the inclusion criteria were requested to participate in this study. We collected data on age, anxiety scale score, pain VAS score, number of bone metastatic lesions, and prostate-specific antigen (PSA) value. Anxiety was assessed by use of the modified memorial anxiety scale for prostate cancer (MAX-PC) and pain was assessed by use of a VAS (score, 1 to 10). The modified MAX-PC questionnaire consisted of 11 questions, which are shown in the Appendix. The MAX-PC questionnaire was validated in a study assessing anxiety by Roth et al. [17] in New York and in a study by Van den Bergh et al. [18] in Rotterdam. The number of study subjects was 34 with early-stage prostate cancer and 34 with advanced-stage prostate cancer. Subjects who had a MAX-PC score ≥ 16 were classified in the pathological group [17-19]. Approval for this study was obtained from the health research ethics committee in the Faculty of Medicine, “Cipto Mangunkusumo” Hospital, University of Indonesia.

3. Data analysis

Data were analyzed and presented in a frequency distribution table. Comparison of anxiety scores between early-stage prostate cancer patients and advanced-stage prostate cancer

patients was performed by use of independent *t*-tests. If the independent *t*-test requirement was not met, the Mann-Whitney test was used. The study confounding factors were VAS, PSA value, number of bone metastatic lesions, and age. The relationship between age, VAS, and PSA value with the anxiety score was analyzed by using the Pearson correlation test. If the Pearson correlation test requirement was not met, the Spearman test was used. The data were analyzed by using the Statistical Package for the SPSS ver. 17 (SPSS Inc., Chicago, IL, USA). The analysis was considered significant if the *P*-value was < 0.05 .

RESULTS

Of the 68 subjects, there were 34 early-stage and 34 advanced-stage prostate cancer patients. The mean age of the subjects was 67.99 ± 8.724 years. The mean MAX-PC score was 10.47 ± 4.64 . Of the 68 subjects, 59 subjects did not have a pathological MAX-PC score (MAX-PC score < 16). Nine subjects, however, had pathological MAX-PC scores. Of those 9 subjects, 1 subject was an early-stage prostate cancer patient and 8 subjects were advanced-stage prostate cancer patients. The mean VAS score was 4.05 ± 1.99 . Other characteristics of the data set can be seen in Table 1.

As stated above, the mean MAX-PC score in this study was 10.47 ± 4.64 , with a median value of 9 (range, 1–23), and the mean VAS score was 4.05 ± 1.99 , with a median value of 4 (range, 1–8). We found a significant difference in the anxiety score and the mean VAS score between the groups with early-stage and advanced-stage prostate cancer. The mean anxiety score in the group of early-stage prostate cancer patients (8.32 ± 3.65) was significantly lower than the mean anxiety score in the advanced-stage prostate cancer group (12.61 ± 4.56). Analysis of this relationship is shown in Tables 2 and 3.

The relationship between confounding factors (age, VAS, PSA value, number of bone metastatic lesions) and the MAX-

Table 1. Subject characteristics in the early- and advanced-stage prostate cancer groups

Characteristic	Early-stage prostate cancer		Advanced-stage prostate cancer	
	Mean	Median	Mean	Median
Age (yr)	67.39	68.00	68.56	71.00
Prostate-specific antigen (ng/mL)	43.75	13.72	522.26	189.47
No. of bone metastatic lesion	NA	NA	12.85	6.50

NA, not applicable.

Table 2. Analysis of the relationship between prostate cancer stage and MAX-PC score

Prostate cancer stage	MAX-PC value	P-value
Early-stage	8.32 ± 3.65 (1–19)	0.0001 ^{a)}
Advanced-stage	12.61 ± 4.56 (2–23)	

Values are presented as mean ± standard deviation (range).

MAX-PC, memorial anxiety scale for prostate cancer.

^{a)}Mann-Whitney test.

Table 3. Comparison of mean VAS pain scores in the early- and advanced-stage prostate cancer groups

Prostate cancer stage	Value	P-value
Early-stage	3.32 ± 1.77 (1–8)	0.002 ^{a)}
Advanced-stage	4.79 ± 1.96 (1–8)	

Values are presented as mean ± standard deviation (range).

VAS, visual analogue scale.

^{a)}Mann-Whitney test.

PC score was analyzed by using the Spearman test. This study found that the correlation between age and MAX-PC was not significant with no strong positive correlation. Interestingly, a significant association was found between VAS scores and the MAX-PC score ($P < 0.001$) with a very strong positive correlation ($r = 0.633$), which could mean that the greater the VAS score the greater the MAX-PC score. These correlations are shown in Table 4.

DISCUSSION

Problems in treating cancer patients include not only the cancer itself, but also the quality of life and psychological problems of patients. Anxiety and depression are the most common psychological disorders in patients with cancer [17]. It has been reported that the level of anxiety and depression is higher in prostate cancer patients than in healthy men. The MAX-PC is a valid and reliable method for identifying anxiety related to prostate cancer [19,20]. In this study, the mean MAX-PC score was 10.47 ± 4.64 . Similar results were reported by Van den Bergh et al. [20], who found a mean MAX-PC score of 9.3 ± 6.8 . The analysis of the relationship between prostate cancer stage and anxiety scores showed a significant difference in the mean MAX-PC score ($P = 0.0001$) between the early-stage prostate cancer group (8.32 ± 3.65) and the advanced-stage prostate cancer group (12.61 ± 4.56). Vodermaier et al. [16] reported the same findings that anxiety symptoms were more commonly found in metastatic prostate cancer patients than in nonmetastatic prostate cancer patients.

Another study by Bill-Axelson et al. [21] suggested that the hospitalization rate related to psychiatric symptoms (anxiety)

Table 4. Correlation of MAX-PC scores with age, VAS, PSA value, and number of bone metastatic lesions

Variable	Correlation coefficient with MAX-PC score	P-value
Age	0.168	0.170 ^{a)}
PSA	0.263	0.032 ^{a)}
No. of bone metastatic lesion	0.464	<0.001 ^{a)}
VAS	0.633	<0.001 ^{a)}

MAX-PC, memorial anxiety scale for prostate cancer; VAS, visual analogue scale; PSA, prostate-specific antigen.

^{a)}Spearman test.

will increase along with the diagnosis of prostate cancer. In patients with advanced-stage cancer, there would be more treatment for anxiety with a relative risk of 2.28 (95% confidence interval, 1.45–3.57) compared with early-stage cancer [21]. The most common metastatic site of prostate cancer is bone. In prostate cancer, bone metastatic lesions result in localized pain [22]. In our study, the pain score (VAS) in patients with advanced-stage prostate cancer was significantly higher than that in patients with early-stage prostate cancer. In this study, there were some confounding variables significantly related to the MAX-PC score ($P < 0.05$). These were the level of pain (VAS score), PSA value, and number of bone metastatic lesions. The VAS score was significantly correlated with the anxiety level (MAX-PC score). Cancer pain in prostate cancer patients was considered to have a major effect on anxiety level ($r = 0.633$, $P < 0.001$); therefore, the proper management of pain is important.

The high level of anxiety could affect patient decision making in determining the treatment of choice [19,23]. A study by Latini et al. [24] showed that early-stage prostate cancer patients who have a high level of anxiety tend to make an early decision for more aggressive therapy compared with undergoing active surveillance. The existence of this anxiety disorder along with depression would interfere in daily activities, reduce the quality of life, and increase the incidence of suicide of prostate cancer patients [3,7,9]. Factors that could increase the risk of anxiety in cancer patients are advanced stage of cancer, previous history of anxiety, lack of family support, activity limitations due to cancer, other comorbidities, and unresolved cancer pain [23]. In the National Comprehensive Cancer Network distress guideline version 2.2013, an indication for referring a cancer patient to mental health services or social work and counseling services is a Distress Thermometer value of 4 or more with social, family, physical, emotional, and other medical problems. In assessing prostate cancer-related anxiety, we have not yet found a cutoff score

on the MAX-PC for referral to mental health services (psychiatry). Despite some research on the psychological needs of men with prostate cancer in Asian countries, it is difficult to draw clear conclusions about the impacts of prostate cancer on the psychological health of Asian men with prostate cancer [15]. Further investigations are required to determine the cutoff score on the MAX-PC questionnaire for referral to mental health services.

The limitations of this study were the relatively small number of study subjects (34 patients in each group) and the lack of guidelines in terms of psychiatric treatment for patients with high levels of anxiety. This study also did not examine the effect of the high level of anxiety on patient quality of life and their therapy selection. Future studies should be conducted to determine the cutoff value of MAX-PC score for referral by use of the MAX-PC instrument in combination with a psychiatric diagnostic instrument, such as the Mini-International Neuropsychiatric Interview for The Diagnostic and Statistical Manual of Mental Disorders (MINI, DSM-IV). The MINI is a short, structured diagnostic interview developed in 1990 by psychiatrists and clinicians in the United States and Europe for DSM-IV and International Statistical Classification of Diseases-10th revision psychiatric disorders [25].

In conclusion, advanced-stage prostate cancer was significantly related to a high level of anxiety (MAX-PC score). Furthermore, VAS scores, PSA value, and the number of bone metastatic lesions might affect the anxiety (MAX-PC score) of patients with prostate cancer. Study of larger populations should be done to acquire a cutoff value of the MAX-PC score for better management of mental health issues in prostate cancer patients.

CONFLICT OF INTEREST

No potential conflict of interest relevant to this article was reported.

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Appendix. Modified memorial anxiety scale for prostate cancer (MAX-PC). Below is a list of comments made by men about prostate cancer. Please indicate by circling the number next to each item how frequently these comments were true for you during the past week; not at all, rarely, sometimes, often

	Not at all	Rarely	Some-times	Often
1. Any reference to prostate cancer brought up strong feelings in me.	0	1	2	3
2. Even though it's a good idea, I found that getting a PSA test scared me.	0	1	2	3
3. Whenever I heard about a friend or public figure with prostate cancer, I got more anxious about my having prostate cancer.	0	1	2	3
4. When I thought about having a PSA test, I got more anxious about my having prostate cancer.	0	1	2	3
5. Other things kept making me think about prostate cancer.	0	1	2	3
6. I felt kind of numb when I thought about prostate cancer.	0	1	2	3
7. I thought about prostate cancer even though I didn't mean to.	0	1	2	3
8. I had a lot of feelings about prostate cancer, but I didn't want to deal with them.	0	1	2	3
9. I had more trouble falling asleep because I couldn't get thoughts of prostate cancer out of my mind.	0	1	2	3
10. I was afraid that the results from my PSA test would show that my disease was getting worse.	0	1	2	3
11. Just hearing the words "prostate cancer" scared me.	0	1	2	3

Modified MAX-PC score ≥ 16 was the cutoff score for pathological prostate cancer specific anxiety state. PSA, prostate-specific antigen.