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Trends of clinical symptoms and prognosis of middle-aged prostate cancer patients after instigation of prostate specific antigen-based population screening

Yasuhide Kitagawa, Atsushi Mizokami, Mikio Namiki

Department of Integrative Cancer Therapy and Urology, Graduate School of Medical Science, Kanazawa University, Kanazawa, Japan

Purpose: Due to the low rate of screening for prostate cancer in Japan, the incidence rates of cancer are high. We have established a prostate-specific antigen (PSA)-based screening system for prostate cancer in our region. We analyzed recent trends of clinical symptoms and prognosis of prostate cancer patients aged 55 to 69 years old in our institution.

Methods: Between 2000 and 2007, 162 cases of prostate cancer in patients aged 55 to 69 years old were newly diagnosed. The study population was divided into 119 cases with high PSA without symptoms, 36 cases with urological symptoms, and 7 cases with systemic symptoms. We analyzed the clinical courses of the patients in each group.

Results: The rate of localized disease was significantly higher in the PSA testing group than in the other groups. The median serum PSA levels were 1,600 ng/mL in the systemic symptom group, 13.3 ng/mL in the urological symptom group, and 7.1 ng/mL in the PSA testing group. The probability of nonrecurrence of the patients in the PSA testing group was significantly higher than in the other groups.

Conclusions: The rate of prostate cancer patients diagnosed by PSA testing was relatively high in our institution. These patients have better prognosis than those with symptoms.

Keywords: Prostate neoplasms, Clinical symptoms, Prostate-specific antigen screening, Prognosis

INTRODUCTION

Prostate cancer is the most common form of cancer among men in Western countries, and the mortality rate of prostate cancer was high in the 1990s [1]. However, according to the latest cancer registry in the USA, the mortality rate has decreased since 1992, and in 2004 showed a 34% decrease compared with 1990 [2]. Taking into consideration the recent high rate of prostate-specific antigen (PSA) testing in the USA among men aged 50 years or older, the decrease in cancer mortality may be due to the establishment of PSA-based screening systems and subsequent appropriate treatment for screening-detected prostate cancer.

In Japan, the incidence rates of prostate cancer have increased and are estimated to continue to do so in the near future. The number of patients with newly diagnosed prostate cancer will make this the second most common form of cancer among men in Japan following lung cancer [3]. The mortality rate of prostate cancer will also increase in the future, and it has been predicted to reach 2.8 times higher in 2020 than that in 2000 [4]. One of the reasons for these prospects is that the rate of screening for prostate cancer in Japan is still very low compared with the USA and Western Europe. Screening systems for prostate cancer have not been established by the national government and depend on each municipal government in Japan. Moreover, it is difficult to determine the results

Corresponding author: Yasuhide Kitagawa
Department of Integrative Cancer Therapy and Urology, Graduate School of Medical Science, Kanazawa University, 920-8640 Takaramachi 13-1, Kanazawa, Japan
E-mail: yasukita@med.kanazawa-u.ac.jp / Tel: +81-76-265-2393 / Fax: +81-76-222-6726
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of cancer screening correctly because the cancer registration systems of the various registries have not been standardized [5]. We have established a PSA-based screening system for prostate cancer by the municipal government in Kanazawa, Japan [6], which has been implemented in the region. To investigate the effectiveness and usefulness of our population-based screening program, the present study was performed to analyze the clinical courses of prostate cancer patients aged 55 to 69 years old in our institution.

MATERIALS AND METHODS

Since 2000, we have performed PSA-based screening for prostate cancer in men aged 55 to 69 years old [6]. Between 2000 and 2007, 423 cases of prostate cancer were newly diagnosed in our institution, and 162 of these cases (38.3%) were patients aged 55 to 69 years old. One hundred of these 162 cases (61.7%) were referred to our institution because of high PSA levels detected on PSA-based screening in the region. Nineteen cases (11.7%) were referred from general practitioners because of high PSA levels without urological symptoms. Thirty-six cases (22.2%) had urological symptoms (including symptoms of benign prostatic hyperplasia), and 7 cases (4.3%) had systemic symptoms at the time of diagnosis. The study population was divided into 119 cases with high PSA without symptoms (PSA testing group), 36 cases with urological symptoms (urological symptom group), and 7 cases with systemic symptoms (systemic symptom group). We have followed-up the patients and analyzed the clinical courses of each group.

Table 1. Characteristics of the groups of patients divided by clinical symptoms

Variable	Systemic symptom	Urological symptom	PSA testing
No of patients	7	36	119
Median age (yr)	66	65.5	65
Clinical stage			
T1c, T2	0	24	103
T3	0	3	6
T4	0	3	3
N1 and/or M1	7	6	7
Gleason score			
≤6	0	18	70
7	2	9	34
8–10	5	9	15
Serum PSA (ng/mL)			
≤4	0	1	15
4.1–10	0	13	66
10.1–20	0	7	15
≥20.1	7	15	23

PSA, prostate-specific antigen.

Clinical staging was determined in accordance with the unified TNM criteria based on the results of digital rectal examination, transrectal ultrasound, computed tomography, magnetic resonance imaging (MRI), and bone scan [7]. Pathological tumor grading was determined by transrectal biopsy before initiation of any treatment.

The mean follow-up time was 37.1 months. Biochemical recurrence was defined as two consecutive increases in serum PSA levels. Freedom from biochemical and/or clinical recurrence was calculated from the date of pathological diagnosis. Kaplan-Meier analysis was used for estimation of recurrence and cause-specific survival, and the significance of differences between each group was determined using the log-rank test. Other statistical assessments were performed using the χ^2 and Fisher exact tests, and $P<0.05$ was considered statistically significant.

RESULTS

Age, clinical stage, Gleason score of prostate biopsy specimens, and serum PSA levels at diagnosis of the patients are presented in Table 1. The patients recruited into this study ranged in age from 55 to 69 years, and there were no significant differences in age between the three groups. All of the patients in the systemic symptom group had distant and/or lymph node metastases. The clinical stages of the patients in the urological symptom group and in the PSA testing group were T1c and T2 for 24 and 103 patients, T3 for 3 and 6, T4 for 3 and 3, and N1 and/or M1 for 6 and 7, respectively. The rate of localized disease was significantly higher in the PSA testing group than in the other groups. The median Gleason scores of biopsy specimens were as follows: systemic symptom group, 9; urological symptom group, 6.5; and PSA testing group, 6. The Gleason score of biopsy specimens in the PSA testing group was significantly lower than in the other groups. In terms of serum PSA level at diagnosis, as we set the PSA cutoff to 2.0 ng/mL in our screen-

Table 2. Primary treatments for each group

Treatment	Systemic symptom	Urological symptom	PSA testing
Radical prostatectomy	0	15	48
High dose brachyterapy	0	8	37
Permanent implant brachyterapy	0	0	6
External beam radiation	0	1	1
Primary androgen deprivation	7	12	21
Watchful waiting	0	0	5
HIFU	0	0	1

PSA, prostate-specific antigen; HIFU, high-intensity focused ultrasound.

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