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Prognostic factors in metastatic prostate cancer

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Abstract

Objective: Aim of this study is to determine the prognostic value of age, serum alkaline phosphatase, pretreatment PSA level, Gleason score, and number of bone metastasis focuses.

Patients and methods: One hundred fifty-one patients who had been followed in our clinic between years 1989 and 2006 were investigated retrospectively.

Results: As a result of this study, it has been detected that serum alkaline phosphatase, Gleason score, and intensity of bone metastasis are important and statistically significant prognostic factors, and affects time to progression and life time. But pretreatment PSA level, and age have been detected not to be effective in predicting time to progression and life time.

Conclusion: Metastatic prostate cancer provides a wide spectrum for risk of death from the disease, and clinicians have long sought methods to predict the outcome accurately in individual patients. In our study, we found that high serum alkaline phosphatase, high Gleason score, and intense bone metastasis (>6) has negative impact on progression and survival.

Keywords: Metastatic prostate cancer; Prostate specific antigen; Gleason score; Prognostic factor

1. Introduction

Prostate cancer is in the first place in point of the frequency of cancer and in the second place considering the deaths resulting from cancer [1].

It is seen that when many men are diagnosed with prostate cancer, it is not restricted only to the organ. Moreover, although early diagnosis and treatment of the disease is possible owing to some scanning studies, for some patients the disease develops rapidly and displays progression, and for some, its progression may be very slow. This shows that some prognostic factors are effective in the progress of the disease.

Thus, many studies have been made for searching the prognostic factors that could help to determine the treatment strategy and to predict the reactions of the patients to the treatment.

Among these prognostic factors are age, pain and performance score, pretreatment PSA value, pretreatment testosterone level, number of bone metastasis, Gleason score, DNA polyploid, hemoglobin level, alkaline phosphates level, P53 level, and PSA change during the treatment.

In this retrospective study, the effects of age, pretreatment PSA level, Gleason score, number of bone metastasis, and the serum alkaline phosphatase (ALP) level on the patient's progression time and life time were researched in patients with metastatic prostate cancer.

2. Materials and methods

This is a retrospective study done with 151 patients who were diagnosed with prostate cancer and regularly followed until their deaths between the years 1989 and 2006. Their disease was diagnosed through biopsy done due to suspect rectal examination and high PSA levels, or through examinations done because of bone pain. All patients with the diagnosis of metastatic prostate cancer were included in the protocol of hormone deprivation treatment. Bilateral orchiectomy was preferred for the patients for whom the missing potent was not a problem, and GNRH analogues were used for the other patients. All of the patients were subjected to maximal androgen blockage treatment.

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For all the patients, age, pain score, performance score, histological grades, serum PSA values, serum alkaline phosphates values, and initial bone scintigraphy results were recorded beginning from the first diagnosis.

After the patients were diagnosed and begun to be treated, their conditions were regularly followed every 3 months. During the follow-up period, the patients with the increase of 50 % in their lowest PSA value during the treatment were required to be controlled every 2 or 4 weeks. It was identified that PSA level in these patients was high a total of three times. This time was accepted as the progression time.

While determining the life times of the patients, the deaths that resulted from prostate cancer or any other reason were assessed together, without any distinction, because the reason for death could not be identified all the time.

Serum PSA values were determined in the same laboratory through ELISA method. Normal value was accepted as 0–4 ng/m. The PSA values of the patients were evaluated as 0–4, 4–20, and over 20 ng/ml. In the pathological examinations of the patients, Gleason scores were considered as 2–4, 5–7 and 8–10.

Scintigraphy results were assessed considering the history of the trauma and arthritis experienced by the patients. While determining the number of metastasis in scintigraphy, the number of metastasis in each vertebra and rib was accepted as 1; in the statistical evaluation, the number of bone metastasis was assessed as 6 and less, and over 6.

For statistical analysis, Kaplan Meier survival analysis was used for evaluating each variable. The groups differing in their variables were compared through this analysis. Whether there was any significant difference between these groups in terms of their survival results or not was assessed using long-rank analysis.

Table 1
Characteristics of the patients

Characteristics	Number of patients	Percentage (%)
Age		
50–60	24	15.89
61–70	91	60.26
71–80	30	19.86
<80	6	3.97
PSA value (ng/ml)		
0–4	8	5.3
4–20	19	12.6
<20	124	82.1
Gleason score		
2– 4	15	9.9
5– 7	66	43.7
8–10	70	46.4
Number of bone metastasis		
≤6	79	52
>6	72	48
Clinicle Stage		
T3 N0 M1b	39	25.82
T3 N1 M1b	14	9.27
T4 N0 M1b	62	41.05
T4 N1 M1b	28	18.54
T4 N1 M1c	6	3.97
ALP		
Normal	92	60.92
High	59	39.08

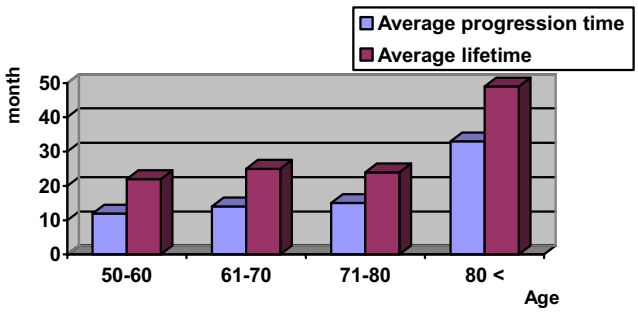

Fig. 1. Average progression and lifetime of the patients according to age. (Color version of figure is available online.)

3. Findings

The ages of the patients involved in the study were between 50 and 81 (mean 66.5). The information about the patients can be seen in Table 1.

We found that the effect of age on progression time and life time was statistically insignificant (Fig. 1).

For 8 patients (5.3 %) whose PSA values were between 0 and 4, average progression time was 25 months (10–48 months) and average life time was 37 months (12–66 months). For 19 patients (12.6 %) whose PSA values were between 4 and 20, average progression time was 22 months (9–60 months) and average life time was 33 months (10–72 months). And, for 124 patients whose PSA values were over 20, average progression time was 15 months (4–40 months). The average life time was found to be 27 months (4–96 months) for them (Fig. 2).

We also found that clinical stage was a statistically insignificant factor for progression time and life time. The differences between the groups with regard to the progression time were statistically insignificant ($P = 0.17$).

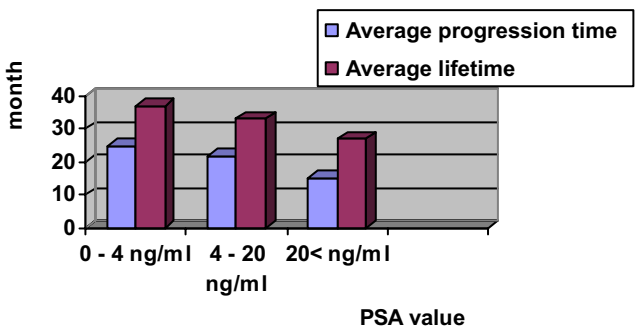

Fig. 2. Progression and time alive of the patients according to the PSA value. (Color version of figure is available online.)