Improved grouping system combining Gleason score for group IV of TNM prognostic grouping for prostate cancer: Results from J-CaP database.

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Abstract

Introduction and Objective: Prognostic grouping for prostate cancer was introduced in the 7th Edition of the TNM Classification of Malignant Tumors. We evaluated the new prognostic grouping system using the Japanese prostate cancer database, which mainly contains patients with relatively advanced disease.

Materials and Methods: The Japan Study Group for Cancer of the Prostate (J-CaP) have performed a nationwide longitudinal observational study of patients who started hormone therapy for prostate cancer from January 2001 to December 2003. A total of 26,727 cases have been registered, including 17,455 patients who initially received primary androgen deprivation therapy (PAPT) and for whom detailed information on background characteristics and survival are available. Overall survival at five years after PAPT was estimated by the Kaplan-Meier method according to the new TNM prognostic grouping. We divided the patients in group IV into two subgroups based on the Gleason score (<8 and ≥8) at diagnosis.

Results: The 17,455 patients from the J-CaP database were stratified by TNM prognostic grouping into group I (1,736, 9.9%), II (1,890, 10.8%), IIIA (4,185, 24.0%), IIIB (3,285, 18.8%) and IV (6,359, 36.5%) cases. In these groups, the overall 5-year survival rates after PAPT were 89.6%, 86.9%, 84.6%, 78.3%, and 51.9%, respectively. These subgroups had overall 5-year survival rates after PAPT of 57.1% and 46.7%, respectively.

Conclusion: We applied TNM prognostic grouping to cases in the J-CaP database. In TNM group IV, a Gleason score of 8 was used as a cutoff to form two well-balanced subgroups that permitted the overall survival risk to be stratified in detail for cases with advanced prostate cancer.

Prognostic Grouping in TNM Classification(7th Ed.)

- **Group I**: T1a-c, N0, M0, PSA <10, Gleason <6
- **Group II A**: T1a-c, N0, M0, PSA ≥10, Gleason <6
- **Group II B**: T2c, N0, M0, Any PSA, Gleason Any
- **Group III**: T3a,b, N0, Any PSA, Any Gleason
- **Group IV**: T4, N0, Any PSA, Any Gleason

**Patient distribution of J-CaP database classified by TNM Prognostic Grouping**

- Group I: 1,736 cases
- Group II A: 1,890 cases
- Group II B: 4,185 cases
- Group III: 3,285 cases
- Group IV: 6,359 cases

**Discussion and Conclusion**

Prognostic groupings for esophageal cancer and prostate cancer were introduced in the 7th Edition of the TNM Classification of Malignant Tumors. The prognostic grouping for prostate cancer is based on the PSA value and Gleason score, in addition to stage grouping using T, N, and M factors. Good prognostic grouping produces a well-balanced distribution in each group with clearly separated prognoses between groups. Application of prognostic grouping is dependent on the patient cohort.

Patients in the J-CaP database who were initially treated with hormone therapy had a high PSA value at diagnosis and a high Gleason score, compared to patients initially treated with hormonal therapy in the US.1 In Japan, the prostate cancer classification (JCA) report on the clinicopathological statistics of registered patients who were diagnosed with prostate cancer in 2000, the percentages of cases with PSA <10 ng/ml and 10 to 20 ng/ml were 29.96% and 22.11%, respectively. Among the patients in the J-CaP database, these percentages were 24.7% and 19.2%, respectively. The high PSA value at diagnosis may be associated with the low PSA screening rate in Japan. This tendency for a high PSA value at diagnosis is similar to that in other Asian countries with a low PSA screening rate. In the US, greater PSA screening causes the distribution of patient characteristics to be shifted to a lower stage, and a lower PSA value at diagnosis. This phenomenon is referred to as “stage migration.”

The percentage of cases in J-CaP database with a total Gleason score of 8 to 10 was 27.3%, and many of these cases had a high clinical stage. This high percentage of cases with a high Gleason score is a further difference between our cohort and prostate cancer patients in the US.

In this study, we applied prognostic grouping using the latest edition of the TNM Classification of Malignant Tumors for patients in the J-CaP database. Of a total of 17,455 patients, 6,359 (36.5%) were classified into Group IV. The progression-free and overall survival rates in Group IV were significantly lower than those in other categories. The Group IV cases were divided into subgroups with Gleason scores of <8 (Group Iva) and ≥8 (Group IVb). We suggest that these subgroups are useful for analysis of patients in studies performed before the stage migration era.

In conclusion, improved grouping based on the Gleason score produced a well-balanced distribution for Group IV cases in the J-CaP database. The subgroups provided a detailed stratification of overall survival for patients with advanced prostate cancer.

References

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