Early Response in Alkaline Phosphatase as an Independent Predictive Factor for Disease Progression in Castration-Resistant Prostate Cancer Patients with Post-chemotherapy PSA Elevation

Introduction and Objective: Prostate-specific antigen (PSA) changes during the early phase of chemotherapy are known to be inaccurate surrogates for outcome in castration-resistant prostate cancer (CRPC). We investigated the potential value of serum markers related to skeletal metastasis as differentiating and/or surrogate biomarkers in CRPC patients.
Materials and Methods: We retrospectively reviewed 83 patients with CRPC who received chemotherapy from 2002 to 2008. Baseline levels and serial changes of serum PSA, alkaline phosphatase (ALP) and calcium were assessed. Pre-treatment clinical data and follow-up serum markers were also evaluated. We analyzed the relationship between serum markers and PSA flare and outcomes.
Results: Of 61 patients, PSA initially increased in 33 patients (54.1%) and PSA flare occurred in 14 (22.9%). Of the 14 patients with PSA flare, the initial ALP increased in 2 (14.3%) and the initial calcium level increased in 5 (35.7%). In contrast, of the 19 patients with PSA progression, the initial ALP increased in 16 (84.2%) and calcium increased in 9 (47.4%). Multivariate analysis showed that only an initial change in ALP was associated with the occurrence of PSA flare. In addition, outcome analyses revealed that an initial increase in ALP and PSA were independently associated with disease progression, but only an initial change in ALP was a significant predictor for progression in patients with an initial increase in PSA.
Conclusions: The early response in ALP level after chemotherapy is a differentiating marker between PSA flare and PSA progression and is an independent predictive marker for progression-free survival in CRPC patients with post-chemotherapy PSA elevation.