Early biochemical relapse after radical prostatectomy: which prostate cancer patients may benefit from a restaging 11C-Choline PET/CT scan before salvage radiation therapy?


Abstract

The aim of the study was to assess which factors may influence 11C-choline PET/CT detection rate in a population of recurrent prostate cancer (PCa) patients listed for salvage radiation therapy (S-RT) in an early phase of biochemical relapse, to select which patients could obtain the most benefit by performing restaging 11C-choline PET/CT before S-RT.

METHODS: The study comprised 605 patients, treated with radical prostatectomy (RP) with curative intent for PCa who showed rising PSA levels after primary therapy and listed for S-RT. Prostate-specific antigen (PSA) values were >0.2 ng/mL and <2 ng/mL (mean, 1.05 ng/mL; median, 1.07 ng/mL; range, 0.2-2 ng/mL; SD, ±0.59). All patients were classified as N0 after RP. Seventeen of 605 patients received adjuvant RT together with RP, whereas 148 of 605 patients received androgen-deprivation therapy (ADT) at the time of PET/CT. PSA, PSA kinetics, Gleason score, age, time to biochemical relapse, ADT, and initial tumor stage were statistically analyzed to assess which factor could influence PET/CT positivity and the detection of local versus distant relapse.

RESULTS: 11C-choline PET/CT was positive in 28.4% of patients (172/605). Eighty-three of 605 patients were positive in the pelvis (group A), distant metastasis (group B) were detected in 72 of 605 patients, and local and distant sites of relapse were detected in 17 of 605 patients (group C). At multivariate analysis, PSA, PSA doubling time (PSAdt), and ongoing ADT were significant predictors for positive scan results, whereas PSA and PSAdt were significantly related to distant relapse detection (P < 0.05). At the receiver-operating-characteristic analysis, a PSA value of 1.05 ng/mL and PSAdt of 5.95 mo were determined to be the optimal cutoff values in the prediction of a positive (11)C-choline PET/CT scan, with an area under the curve (AUC) of 0.625 for PSA and 0.677 for PSAdt.

CONCLUSION: (11)C-choline PET/CT may be suggested before S-RT during the early phase of biochemical relapse, to select patients who may benefit from this aggressive treatment. Particularly, patients showing fast PSA kinetics or PSA increasing levels despite ongoing ADT should be studied with (11)C-choline PET/CT before S-RT, considering the higher probability to detect positive findings outside the pelvis.
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