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Does Choline PET/CT Change the Management of Prostate Cancer Patients With Biochemical Failure?


Abstract

PURPOSE:: The FDA approved C-11 choline PET/computed tomography (CT) for imaging patients with recurrent prostate cancer in 2012. Subsequently, the 2014 NCCN guidelines have introduced labeled choline PET/CT in the imaging algorithm of patients with suspected recurrent disease. However, there is only scarce data on the impact of labeled choline PET/CT findings on disease management. We hypothesized that labeled-choline PET/CT studies showing local or regional recurrence or distant metastases will have a direct role in selection of appropriate patient management and improve radiation planning in patients with disease that can be controlled using this mode of therapy.

METHODS:: This retrospective study was approved by the Tel Aviv Sourasky and Sheba Medical Center's Helsinki ethical review committees. Patient characteristics including age, PSA, stage, prior treatments, and pre-PET choline treatment recommendations based on NCCN guidelines were recorded. Patients with biochemical failure and without evidence of recurrence on physical examination or standard imaging were offered the option of additional imaging with labeled choline PET/CT. Treatment recommendations post-PET/CT were compared with pre-PET/CT ones. Pathologic confirmation was obtained before prostate retreatment. A nonparametric χ test was used to compare the initial and final treatment recommendations following choline PET/CT.

RESULTS:: Between June 2010 and January 2014, 34 labeled-choline PET/CT studies were performed on 33 patients with biochemical failure following radical prostatectomy (RP) (n=6), radiation therapy (RT) (n=6), brachytherapy (n=2), RP+salvage prostate fossa RT (n=14), and RP+salvage prostate fossa/lymph node RT (n=6). Median PSA level before imaging was 2 ng/mL (range, 0.16 to 79). Labeled choline PET/CT showed prostate, prostate fossa, or pelvic lymph node increased uptake in 17 studies, remote metastatic disease in 9 studies, and failed to identify the cause for biochemical failure in 7 scans. PET/CT altered treatment approach in 18 of 33 (55%) patients (P=0.05). Sixteen of 27 patients (59%) treated previously with radiation were retreated with RT and delayed or eliminated androgen deprivation therapy: 1 received salvage brachytherapy, 10 received salvage pelvic lymph node or prostate fossa irradiation, 2 brachytherapy failures received salvage prostate and lymph nodes IMRT, and 3 with solitary bone metastasis were treated with radiosurgery. Eleven of 16 patients retreated responded to salvage therapy with a significant PSA response (<0.2 ng/mL), 2 patients had partial biochemical responses, and 3 patients failed. The median duration of response was 500±447 days. Two of 6 patients with no prior RT were referred for salvage prostatic fossa RT: 1 received dose escalation for disease identified in the prostate fossa and another had inclusion of "hot" pelvic lymph nodes in the treatment volume.

CONCLUSIONS:: These early results suggest that labeled choline PET/CT imaging performed according to current NCCN guidelines may change management and improve care in prostate cancer patients with
biochemical failure by identifying patients for referral for salvage radiation therapy, improving radiation planning, and delaying or avoiding use of androgen deprivation therapy.

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