Cod: PO051

IMPACT OF 18F CHOLINE PET AND MR ON THE ASSESSMENT OF RISK CLASS IN PROSTATE CANCER

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BACKGROUND-AIM

Prostate cancer (PCa) patients are generally stratified in high, intermediate and low risk categories. Categorization is mainly done on the basis of serum PSA measurement , Gleason score and trans-rectal ultrasound (TRUS). When the disease in not organ-confined, risk group and therapy significantly change, thus imaging methods are of crucial importance. Non invasive imaging includes contrast enhanced CT and MR, diffusion MR TRUS and PET with ^{18}F choline (^{18}F CH) . CT and MR however are not enough sensitive nor specific to become reliable standard methods to detect nodes and to guide surgical or radiation therapy. The role of ^{18}F CH and its relationship with other imaging methods such as contrast enhanced MR and diffusion weighted MR (DWI), at the moment are not exhaustively studied .
Aim of our work is to study the impact of MR and ^{18}F CH PET on the final assessment of risk group and the consequent treatment planning in patients with newly diagnosed PCa.

METHODS

Fifty patients, assigned to low or intermediate risk class on the basis of Gleason score, PSA level and TRUS, were submitted to ^{18}F CH PET and pelvic MR, including contrast enhanced NMR and DWI. After the eventual restaging on the basis of MR/ radioisotope imaging, the patients were treated with radiation therapy and androgen ablation lasting 3 years. Radiation therapy was performed with 54.75 to 60 Gy on prostate in low and intermediate risk patients, 68.75 Gy on prostate and 45 Gy on pelvis in high risk patients. When evidence occurred of the invasion of seminal vesicles or lymph nodes, 55 to 68.75 Gy were delivered on seminal vesicles and an adjunctive boost of 55 Gy was given on each invaded node. Six months after the end of androgen ablation, PSA and imaging exams were repeated. Though semi-quantitative parameters were measured on PET and diffusion MRI, the positivity was decided visually, on the basis of agreement between two well experienced radiologists or, respectively two nuclear medicine physicians.

RESULTS

On the basis of PET and MRI 24 patients (48%) passed from the initial low or intermediate risk category to the high risk category and were consequently treated. In 17 patients re-categorization was due to the finding of extra-capsular invasion of PCa, mainly demonstrated by MRI; in 7 patients the re-categorization was due to discovery of pelvic or iliac lymph node invasion, mainly due to ^{18}F CH PET. In the case of re-categorization due to extra-capsular invasion both PET and MRI were positive, but the morphological evidence of this invasion was clearly evident with MR whereas it was not so clear with PET, due to its suboptimal spatial resolution. Conversely several pelvic nodes were suspicious though not clearly positive at MRI: the only conclusive evidence of the invasion was given by the uptake of ^{18}F CH in some of the suspicious nodes. Of course the adjunctive boost can be delivered to few, not to several nodes per patient.
Six months after end therapy PSA, MRI and PET were negative in all the patients. We are waiting for the results at the 5 year follow up.

CONCLUSION

^{18}F CH PET is useful for N staging, whereas MRI is more effective in detecting the local stage in Pca.