P071

Clinical utility of PSMA PET in biochemically recurrent prostate cancer: A systematic review and meta-analysis

Perera M.[1], Papa N.[2], Roberts M.[1], Udovicic C..[3], Vela I.[1], Bolton D.[2], Hofman M.[4], Lawrentschuk N.[2], Murphy D.[5]

[1]Queensland Health, Dept. of Urology, Brisbane, Australia, [2]Austin Health, Dept. of Urology, Melbourne, Australia, [3]Peter MacCallum Cancer Centre, Dept. of Radiation Oncology, Melbourne, Australia, [4]Peter MacCallum Cancer Centre, Dept. of Nuclear Medicine, Melbourne, Australia, [5]Peter MacCallum Cancer Centre, Dept. of Urology, Melbourne, Australia

Introduction & Objectives: Accurate staging of advanced and metastatic prostate cancer is becoming increasingly more important, particularly at the earlier stages of disease process. ^{68}Ga PSMA-PET has been increasingly utilised globally to assess the burden of prostate cancer, typically in biochemically recurrent or advanced disease. We undertook a systematic review and meta-analysis to update reported predictors of positive ^{68}Ga PSMA-PET according to prior therapy, proportion positive in various anatomical locations, and sensitivity and specificity profiles.

Materials & Methods: We performed critical reviews of MEDLINE, EMBASE, ScienceDirect, Cochrane Libraries and Web of Science databases in June 2018 according to the Preferred Reporting Items for Systematic Review and Meta-analysis (PRISMA) statement. Quality assessment was performed using Quality Assessment if Diagnostic Accuracy Studies-2 tool. Meta-analyses of proportions were performed using a random-effects model. Summary sensitivity and specificity values were obtained by fitting bivariate hierarchical regression models.

Results: 36 articles including 4,467 patients were analysed. For secondary screening, positive 68Ga PSMA-PET scans increased with higher pre-PET PSA. For PSA categories 0-0.19 ng/ml, 0.2-0.49ng/ml, 0.5-0.99 ng/ml, 1-1.99 ng/ml and >2 ng/ml, the percentage positive were 33%, 45%, 59% and 75% and 95% respectively. Significant differences in regional recurrances were noted between RP and RTx patients. On per node analysis, summary sensitivity and specificity were 75% and 99% respectively.

Conclusions: 68Ga PSMA-PET results in improved detection, particularly at low pre-PET PSA levels. 68Ga PSMA-PET produces favourable sensitivity and specificity profiles on meta-analysis of pooled-data. This analysis highlights different anatomic patterns of metastatic disease on PSMA in the primary and biochemically recurrent settings.