Utility of fluoro-deoxy-glucose positron emission tomography (FDG-PET) to predict a pelvic lymph node involvement (LNI) in patients (pts) with muscle-invasive bladder cancer (MIBC) enrolled in neoadjuvant therapy trials.

Antonio Cigliola, Giuseppe Basile, Chiara Mercinelli, Daniele Raggi, Valentina Tateo, Damiano Alfio Patanè, Emanuele Crupi, Maurizio Colecchia, Renzo Colombo, Giulio Avesani, Chiara Re, Alberto Briganti, Francesco Montorsi, Andrea Necchi; Medical Oncology Department, IRCCS San Raffaele Hospital, Milan, Italy; Urology Unit, IRCCS San Raffaele Milano, Milan, Italy; Medical Oncology Unit 2, Azienda Ospedaliero-Universitaria Pisana, Pisa, Italy; Department of Medical Oncology, IRCCS San Raffaele Hospital, Milan, Italy; Vita-Salute San Raffaele University, Milan, Italy; Urology Unit, IRCCS Ospedale San Raffaele, Milan, Italy; Urology Unit, IRCCS San Raffaele Hospital, Milan, Italy; Vita-Salute San Raffaele University, Milano, Italy; IRCCS Ospedale San Raffaele, Urological Research Institute, Milan, Italy; Vita-Salute San Raffaele University, IRCCS San Raffaele Hospital, Milan, Italy

Background: FDG-PET is reported to have limited utility in pts with MIBC. However, standard computed tomography (CT) imaging can often underestimate disease extent, and its role in predicting a pathological pelvic lymph node involvement (LNI) is very limited. Previous findings from PURE-01 trial reported a potential use of FDG-PET to exclude the few pts with T2-4N0M0 and pelvic LN uptake from neoadjuvant trials with immune-checkpoint inhibitors (ICI; PMID: 33071107). The aim of this study was to extend these findings to a wider range of experimental therapies. **Methods:** We collected the data of pts with clinical stage T2-4N0-1M0 MIBC included in past and ongoing neoadjuvant trials sponsored by our center, including single agent or combination of immune-checkpoint inhibitors (ICI), ICI+chemotherapy (ChT), standard ChT and sacituzumab govitecan. All pts had predominant urothelial carcinoma (UC) histology and were staged with standard thorax-abdomen CT scan and with PET/CT scan during screening and after treatment, before radical cystectomy (RC). PET/CT images were evaluated qualitatively for increased or abnormal areas of FDG uptake with corresponding anatomic alterations in CT slices. All pts underwent templated pelvic lymph node dissection (LND) with packeted node submission. Multivariable logistic regression analyses (MVA) for pathological LNI prediction were run, including cT-stage and the presence of variant histologies (VH). **Results:** A total of 149 pts (298 PET scans) were identified, treated between 02/2017 and 08/2023. 112 pts (75.2%) received ICI, 26 (17.4%) ICI+ChT, 11 (7.4%) the remaining therapies. 36 pts (24%) had a VH, 72 (48%) a cT3-4 stage, and 12 (8.1%) a cN1 stage. In total, 20 (13%) and 16 (11%) pts had PET+ pre- and post-therapy, respectively. The accuracy of FDG-PET and CT scan in predicting LNI in overall pts was similar, both pre-therapy (85.3% and 86.7%) and post therapy (86.7%, 84.6%), the only exceptions being a lower accuracy of PET to predict presacral LNI (76.6%, 78.8% pre- and post-therapy) and in VH pre-therapy (84.3% vs 90.9% PET vs CT). A pre-therapy FDG uptake significantly predicted a pathological LNI in MVA (OR: 17.8, 95%CI: 4.18-94.86, $p<0.001$, AUC: 0.89), with consistent results in T2-4N0M0 cohort (OR: 18.17, 95%CI: 4.15-99.25, $p<0.001$, AUC: 0.84). **Conclusions:** Despite the proportion of FDG-PET positive pts was modest in T2-4N0-1M0 MIBC, we were able to confirm that these pts were predicted to be poor responders to neoadjuvant therapies regardless of the type of treatment. FDG-PET had lower prediction ability of LNI in presacral LN region and in pts with a VH. This information should be critically considered for patient selection in neoadjuvant therapy trials. Research Sponsor: None.