THE POTENTIAL OF PET SCAN IN THE DETECTION AND MONITORING OF DIALYSIS RELATED AMYLOIDOSIS, STILL A PROBLEM IN DIALYSIS PATIENTS

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INTRODUCTION AND AIMS: Dialysis related amyloidosis is still a relevant problem in long-term dialysis patients. Two treatments options are reviving interest in this disease: the expensive adsorption columns and the inexpensive doxycycline treatment, included in the orphan drugs for beta2 microglobulin amyloid treatment. An imaging test able to identify sites of active deposition of beta2 microglobulin fibrils is still lacking. Few recent case reports suggest that positron enhanced tomography (PET scan) may reveal sites of active deposition (mild persistent inflammation), potentially representing a tool for evaluating the metabolic response to treatments. In this study we examined all PET scans performed in a cohort of patients treated in an in-hospital dialysis Centre for high comorbidity patients in the period 2016-2017.

METHODS: During the period of study 145 patients were on chronic dialysis (80% on hemodialysis); 36 had performed at least one PET scan; overall 56 scans were evaluated. A “dialysis related amyloid score” was defined by dialysis vintage (1 point per year), follow-up after kidney transplantation or pre-dialysis (0.25 per year), carpal tunnel syndrome (5 per size) and any clinical evidence of amyloid deposits (arthropathy or other tissues- organs: 5 points). PET scan was considered positive for amyloid deposits when the standardize uptake value (SUV) was higher than in liver; two settings of typical amyloid deposition were analysed (hips and shoulders). Clinical scores were defined and controlled with the senior dialysis doctor; PET scores were defined by an operator blind to the clinical score, and controlled by the senior nuclear doctor. Carpal tunnel syndrome was also considered as a proxy of diagnosis of dialysis related amyloidosis.

RESULTS: The PET scan analysed had been performed with various indications (diagnosis or follow-up of neoplasia, vasculitis, search for infections) in 36 patients (23 M, 13 F; median age 70.18 years; median RRT vintage 10.5 years; median Charlson comorbidity index: 9). The median amyloid score was 7.8. Nineteen of 22 PET scans performed in patients with clinical score ≥ 16 were positive, only 3 tested negative. Conversely, 9 of 34 PET scans in patients with score < 16 showed increased metabolic activity (6 of them in patients with active neoplasia, 1 vasculitis, 2 with systemic inflammatory syndrome). Sensitivity of the PET scan in detecting amyloid deposits was 86% and specificity 73% with respect to amyloid score. Sensitivity and specificity of PET scan were 84% and 60% with respect to carpal tunnel surgery, taken as a proxy of dialysis-related amyloidosis; once more, the positive scans were mainly in the setting of active neoplasia (10/17) or systemic inflammatory syndrome (6/17).

CONCLUSIONS: PET scan may be a useful test for detecting and monitoring dialysis related amyloidosis and for assessing the response to treatments; the positivity in case of neoplasia or vasculitis may be non specific or linked to rapid amyloid deposition in the setting of high grade inflammation; this issue and the possibility to use PET scan to control for therapeutic efficacy need further prospective studies.