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MULTIMODAL NUCLEAR MEDICINE APPROACH IN THE WORK-UP OF INFANTS AND CHILDREN WITH AN HIGH URINARY TRACT INFECTION

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BACKGROUND-AIM

In the infants and children with a known vesicoureteral reflux (VUR) or an urinary tract infection (UTI) several nuclear medicine examinations are currently performed and repeated during the time, with the aims of diagnosing and monitoring the evolution of the vesicoureteral reflux (VUR), for studying the renal residual damage (scars) or the concomitant presence of other urinary alterations.
Aim of the present study is to evaluate the sequence, the rotation and the comparative frequency of different nuclear medicine procedures in the clinical management and follow-up of these patients in order to assess their relative clinical and practical impact.

METHODS

We performed a retrospective analysis in the consecutive patients with a diagnosis of suspicious or known VUR after UTI referred to our Institute for a minimum of two or more scans in a well defined period of time.

RESULTS

From September 2003 to December 2012 a total of 509 scans has been performed in 203 patients: the first examination consisted of 32 cystoscintigraphy(CYST); 65 DMSA, 93 MAG3 renography(MAG), 23 MAG3 renography plus voiding study (indirect cystoscintigraphy) (MAG-CYST); the second examination consisted of 71 CYST; 35 DMSA, 59 MAG, 48 MAG-CYST. The third examination, performed in 63 patients, consisted of 26 CYST; 8 DMSA, 17 MAG, 12 MAG-CYST. The forth examination, performed in 17 patients, consisted of 6 CYST,2DMSA,3MAG,6 MAG-CYST. The fifth examination was performed in two patients (CYST) and the sixt in one patient (MAG-CYST). The patient studied six times performed 5 CYST and one MAG-CYST ; the patient studied 5 times performed as first examination the DMSA, but subsequently he was alternatively studied with MAG and CYST. Among the 14 patients studied four times, DMSA was performed one time in 3 pts, two and three times in other 2 pts, the remain examinations consisted of an alternance of CYST, MAG, MAG-CYST.
In the remaining patients studied two or three times, DMSA was performed as first and second examination, sometimes two times, MAG as first and second examinations, but in most cases CYSTO and MAG-CYSTO were alternatively performed as the last study.

CONCLUSION

Our data demonstrate that the DMSA, performed in 91/213 patients (43%)is only a part of the diagnostic management of these patients. MAG has been extensively added or replaced to DMSA to exclude the presence of other alterations of the urinary tract, for monitoring both renal damage and furthermore during follow-up to assess the persistence of VUR, by performing MAG-CYST as an alternative to CYST. CYST was mainly performed at diagnosis in the cases of infection not associated with echographic abnormalities, and during follow-up to confirm the definitive disappearance of VUR.