Dynamic magnetic resonance urography vs. DMSA scan, IVP, ultrasonography in children with urinary tract infection

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Background: Urinary tract infection in children causes renal scarring and permanent damage to the organ. In this study, we compared the diagnostic value of magnetic resonance urogram for urinary tract anomalies with other conventional imaging methods in children with UTI.

Methods: In this case-control study, 190 children (mean age 3.23±3.59 yrs) with UTI were recruited from the Pediatric Ward of Rasul-e-Akram Hospital during 2007-2009. The patients were divided into two groups based on the applied imaging technique: MRU (cases) and conventional imaging groups (controls).

Results: Abnormal imaging detection rates for Ultrasonography were 32%, X-ray of kidneys, ureters and bladder (KUB) 9%, Intravenous Pyelogram (IVP) 26%, Voiding Cystouretherogram (VCUG) 54%, Dimercaptosuccinic Acid scan (DMSA) indicating non-obstructive (reflux) uropathy in 76% (mean age 3.5 yrs) and MRU 43% (mean age 1.6 yrs), respectively. A meaningful correlation was observed between MRU and DMSA scan with IVP results (Kappa=0.75). KUB and Ultrasonography had similar results in cases with abnormal MRU and DMSA scan (P=0.121). MRU had strong agreement with VCUG and IVP for the detection of obstructive uropathy and scar due to congenital malformation even during intrauterine life but not with sonography results.

Conclusion: Sonography had poor results for the diagnosis of urinary tract anomalies in comparison with MRU. Use of dynamic MRU for the diagnosis of congenital anomalies (hydronephrosis, obstruction, pyelonephritis, renal scar) in children with UTI seems to be of better help, although higher costs and the need for sedation during MRU still are its disadvantages.

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