

## 3세 이상의 요로감염증 환자에서 99<sup>m</sup>-technetium dimercaptosuccinic acid scan의 필요성과 배뇨성 방광 요도 조영술의 연관성

건국대학교 의학전문대학원 건국대학교병원 소아과학교실

이 상 택 · 김 교 순

### Evaluation of Renal Parenchymal Lesions using 99<sup>m</sup>-technetium Dimercaptosuccinic Acid Scan in Children Over 3 Years of Age with Urinary Tract Infection and the Relation with Vesicoureteral Reflux

Sang Taek Lee, Kyo Sun Kim

Departments of Pediatrics, Konkuk University School of Medicine, Seoul, Korea

**Purpose :** The aim of this study is to examine the factors that might influence on the renal parenchymal lesion, which urinary tract infection (UTI) in the children presenting after the age of 3 years.

**Methods :** A total of 49 patients (12 boys and 37 girls) aged 3 to 17 years during the period July 2005 through March 2008 admitted with a first time symptomatic UTI at pediatric department of Konkuk University Hospital. The male:female ratio was 0.32 in patients aged 3 to 17 years, 0.26 in patients aged 3 to 4 years and 0.36 in patients aged 5 to 17 years. We design this study to assess the various factors that might influence on renal parenchymal lesion that leukocytosis, C- reactive protein (CRP), pyuria (>10 cells/HPF), positive urine culture, median time of fever duration between before and after therapy, renal ultrasonography (US), voiding cystourethrography (VCUG) and scintigraphy with 99m- technetium dimercaptosuccinic acid (DMSA). Correlations between variables were studied using Chi- square test and ANOVA analysis.

**Results :** A total of 49 patients, US was performed in 77.5%. Of them, 11 children (28.9%) had the abnormality. VCUG was performed in 34 children (69.8%). Of them, 15 children (44.1%) had a vesicoureteral reflux (VUR); seven grade I and II, three grade III, five grade IV and V. The DMSA scan was performed during period of urinary tract infection in 14 children (28.5%). DMSA scintigraphy result were abnormal in 8 children (57.1%). Of them, seven of them (87.5%) present VUR, which revealed three grade I and II, two grade III, three grade IV and V. Children who presented a normal DMSA study were 6 patients. One of them had VUR (grade III). There was statistical significance between abnormalities of DMSA scans and VCUG ( $p=0.008$ ). The median time of fever before admission was 48 hours. the median time of fever after therapy was 36 hours. The average duration of hospitalization was 6.4 days. The median value of CRP, WBCs, pyuria were 6.40 mg/dL, 15,765 /uL and 20 cells/ HPF, respectively. The ANOVA analysis presented that elevated CRP level, leukocytosis, duration of fever and pyuria did not correlate with the abnormalities on US, VCUG and DMSA scan.

**Conclusion :** Not all patients with VUR develop renal parenchymal lesions, and neither the presence of VUR always predispose children to renal parenchymal changes. We recommended DMSA renal scan as a tool of choice to make the diagnosis of acute pyelonephritis over 3 years of age than available laboratory tests.

**Key Words :** 요로감염, DMSA 스캔, 배뇨성 방광 요도 조영술  
Acute pyelonephritis, DMSA scan, Vesicoureteral reflux

Table 1.

		VUR		Total
		Normal	Abnormal	
DMSA scan	Normal	5 83.3%	1 16.7%	6 100%
	Abnormal	1 12.5%	7 87.5%	8 100%
Total		6 42.9%	8 57.1%	14 100%
	p value	0.008	$p<0.05$	

Abbreviations : DMSA scan, Dimercaptosuccinic acid scan; VUR, Vesicoureteral reflux