

Technetium-99m-*N,N*-ethylenedicysteine and Tc-99m DMSA scintigraphy in the evaluation of renal parenchymal abnormalities in children

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Technetium-99m dimercaptosuccinic acid (Tc-99m DMSA) as a static renal agent is currently the most frequently used agent in the detection of renal scarring, and allows accurate calculation of differential renal function (DRF). But this agent has some disadvantages such as relatively higher radiation dose and time consumption. **Methods:** The purpose of this study was to evaluate the potential of summed image that obtained from parenchymal phase of the dynamic technetium-99m-*N,N*-ethylenedicysteine (Tc-99m EC) scintigraphy in the detection of renal parenchymal defects and in the estimation of DRF, and to compare the results of this method with those of Tc-99m DMSA scintigraphy. The uptake ratios of the kidney to body background were also calculated for these two methods. Twenty-nine children with various renal disorders underwent both static Tc-99m DMSA and dynamic Tc-99m EC scintigraphy. The cortical analysis of Tc-99m EC scintigraphy was performed on the summed image obtained from dynamic images using the time interval between the first 45–120 sec. **Results:** There was a very close correlation between these two methods with respect to DRF ($r = 0.99$). In the detection of renal parenchymal lesions, scintigraphy with Tc-99m DMSA detected more lesions, and the sensitivity and specificity of the summed Tc-99m EC images were calculated as 92.6% and 100%, respectively. In addition, the ratios of mean uptake values for Tc-99m DMSA and Tc-99m EC images were 7.59 ± 2.17 and 2.95 ± 0.91 , respectively. This ratio of Tc-99m EC seems to be acceptable and allows good delineation of the kidneys. But, the main disadvantages of the summed Tc-99m EC images in comparison with static Tc-99m DMSA images are the use of only posterior projection that may be an important drawback in patients with abnormal kidney positions, lower image counts and higher pixel size because of dynamic acquisition. **Conclusion:** These results show that summed Tc-99m EC images with an acceptable high image contrast provide an accurate DRF calculation in patients without abnormal kidney positions and allow the detection of most renal parenchymal abnormalities. However, Tc-99m DMSA scintigraphy remains the gold standard method because of its well known advantages.

Key words: technetium-99m-*N,N*-ethylenedicysteine, technetium-99m-dimercaptosuccinic acid, differential renal function