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Diuretic renography in children with antenatally detected hydronephrosis

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Diuretic renography (99mTc-DTPA or 99mTc-MAG-3) is a cornerstone method for guiding the clinical management of asymptomatic antenatally detected hydronephrosis (ADH), particularly in distinguishing kidney with the poor drainage from the nonobstructive hydronephrosis with the good drainage. The most important parameter for decision-making is the differential renal function (DRF), both at initial evaluation and on follow-up studies. Semiquantitative assessment of drainage has not been yet standardized, although a general expert consensus exists about giving preference to output efficiency (OE) or normalized residual activity (NORA), less operator-dependent and with more physiological meaning than the previously described half-time for excretion (T 1/2).

On the basis of the results of one of our studies we concluded that in the presence of partial or no drainage on diuretic 99mTc DTPA renography, DRF may not be significantly imparied and finding of poor renal emptying is significantly more common among children with increasing anteroposterior pelvis diameter (APD).

In another study, the model of the multivariate logistic regression which included ultrasound parameters (APD of pyelon, calyces size and parenchymal thickness), and drainage and DRF, derived from diuretic 99mTc MAG-3 renography, which were significant predictors in univariate analysis, showed that only drainage was an independent predictor for the need of pyeloplasty in children with pelvi-ureteric junction stenosis, antenatally detected as hydronephrosis.

NORA and OE have better diagnostic accuracy compared to the standard interpretation of renography, significantly reducing the number of equivocal and false/positive findings for renal obstruction (M. Radulovic, PhD, 2022)..

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