

COMPARISON OF SCHWARTZ EGFR-CR WITH GFR MEASURED BY TC-99M-DTPA CLEARANCE IN HEALTHY CHILDREN AND IN CHILDREN WITH URINARY TRACT INFECTION WITH AND WITHOUT VESICoureTERAL REFLUX

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The aim of this study was to assess the diagnostic reliability of the estimated glomerular filtration rate based on serum creatinine and body height (eGFR-Cr Schwartz) as compared to the glomerular filtration rate (GFR) measured by a radioisotope method using Tc-99m-DTPA clearance in healthy children and in children with urinary tract infections (UTI) with and without a vesicoureteral reflux (VUR) using Bland-Altman analysis.

The retrospective study enrolled 451 paediatric patients (104 male and 347 female, aged 7.07 ± 3.02 , range of 2-15) from a single-institution database. Groups of participants were formed according to their diagnosis: the control group (CG, n = 64), the group with UTI with no documented VUR (UTI, n = 299), and the group with UTI and VUR (VUR, n = 88). The GFR was measured by the Tc-99m-DTPA clearance from a single blood sample drawn 180 minutes after administering the radiopharmaceutical. The eGFR-Cr was determined from an equation which included body height and the serum creatinine level.

When compared to Tc-99m-DTPA GFR, the eGFR-Cr yielded the following mean deviation values in the examined groups: CG: $1.937 \text{ ml/min/1.73m}^2$ (95% limits of agreement [LOA]: $-36.759-40.633 \text{ ml/min/1.73m}^2$), UTI: $-3.010 \text{ ml/min/1.73m}^2$ (LOA: $-57.292-51.272 \text{ ml/min/1.73m}^2$) and VUR: $2.183 \text{ ml/min/1.73m}^2$ (LOA: $-64.019-68.385 \text{ ml/min/1.73m}^2$). eGFR-Cr demonstrated comparable accuracy to Tc-99m-DTPA GFR in the CG and UTI groups with 95% and 82% of values within 30% of the Tc-99m-DTPA GFR. The eGFR-Cr demonstrated a lower measurement reliability in the VUR group, amounting to only 68% of the values within 30% of the Tc-99m-DTPA clearance.

The results proved eGFR-Cr to be a reliable alternative to the radioisotope method in children with preserved renal function and children with a urinary tract infection with no reflux, but a less reliable method in children with both VUR and renal impairment.

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Key words: estimated glomerular filtration rate, Tc-99m-DTPA clearance, children, vesicoureteral reflux, urinary tract infection