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MEASUREMENT OF GLOMERULAR FILTRATION RATE BY PLASMA IOHEXOL CLEARANCE WITH DIFFERENT SINGLE-SAMPLE METHODS

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INTRODUCTION AND AIMS: Iohexol plasma clearance is considered as a reference method to measure glomerular filtration rate (GFR). Single-sample (SS) plasma clearance is easy to perform and results are concordant with multiple-sample techniques. However, different mathematical models exist for the determination of SS method. In the current study, we evaluated the concordance between the different models of the SS method.

METHODS: We collected data from 5106 plasma clearances (iohexol or 51Cr-EDTA) applying the SS methods at 240 minutes after iohexol injection. Seven different mathematical models for calculating GFR from SS were compared: Jacobsson, Jacobsson iterative, Groth, Fleming, Russe, Christensen and Tauxe. Concordance between results were considered acceptable if a concordance within 10% of at least 90% was observed.

Sub-analyses according to GFR levels, body mass index (BMI) and age were also performed between methods with acceptable concordance (90% within 10%) in the whole cohort.

RESULTS: Among the 5106 study participants, mean age was 54 ± 17 years and 42.6% were women. Mean BMI was 26 ± 6 kg/m². Mean GFR obtained by SS using the iterative Jacobsson method was 62 ± 24 mL/min/1.73 m². Concordance between SS results were considered as unacceptable only between both Tauxe and Russe and all the others, and between Groth and Fleming (See Table 1). In sub-analyses, some unacceptable concordances between SS were observed, especially in extreme conditions (Table 1).

CONCLUSIONS: We showed good concordance between iohexol plasma clearance obtained with different SS methods. Further studies are still needed to know the best SS method in low GFR ranges.