

세가지 사구체여과율 측정방법들간의 상관관계 및 비교

국립중앙의료원¹, 제주한라병원², 서울대학교병원 내과³, 보라매병원 내과⁴
차란희¹, 오윤정², 이충식², 신나라³, 황진호⁴, 이하정³, 김동기³, 김성권³, 김연수³

The Correlation and Comparison Among Three Methods for GFR Measurement

Ran-hui Cha¹, Yun Jung Oh², Chung Sik Lee², Na Ra Shin³, Jin Ho Hwang⁴
Hajeong Lee³, Dong Ki Kim³, Suhnggwon Kim³, Yon Su Kim³

National Medical Center¹, Cheju Halla General Hospital²
Department of Internal Medicine³ Seoul National University Hospital
Department of Internal Medicine Boramae Hospital⁴

Background: Renal inulin clearance with continuous infusion method has been recognized as the gold standard for the measurement of glomerular filtration rate (GFR). However, inconvenience and complications associated with the method led to the development of alternative methods. In present study, we aimed to explore the relationships among three different methods for GFR measurement.

Methods: Three different tests including renal inulin clearance with continuous infusion method (gold standard), systemic inulin clearance with a single injection method (standard protocol over 4 hours and extended protocol over 24 hours), and plasma 51Cr-EDTA clearance over 5 hours were performed in one subject to measure GFR. Total of 114 participants had all of three tests. We explored the correlation between methods and compared alternative methods to gold standard method.

Results: There was a strong correlation between systemic inulin clearance and renal inulin clearance with a single injection method ($\gamma=0.89$, $p<0.001$), but renal inulin clearance overestimated systemic inulin clearance in overall. In addition, there was a very strong correlation between systemic inulin clearance measured by standard protocol over 4 hours and extended protocol over 24 hours ($\gamma=0.99$, $p<0.001$), and the difference between them was very small. The strong correlation between renal inulin clearance with continuous infusion method and systemic inulin clearance with single injection method (standard protocol) was observed ($\gamma=0.89$, $p<0.001$). The systemic inulin clearance (standard protocol) underestimated renal inulin clearance, in general (correlation coefficient: 0.89; slope: 0.64). Plasma 51Cr-EDTA clearance also had a very strong correlation with gold standard method ($\gamma=0.92$, $p<0.001$), and overestimated the renal inulin clearance on the whole (correlation coefficient: 0.92; slope: 0.81).

Conclusion: Renal inulin clearance overestimated systemic inulin clearance using a single injection method, and the systemic inulin clearance using extended blood sampling protocol showed no significant difference compared to standard protocol in overall. Alternative methods for GFR measurement such as systemic inulin clearance with a single injection method and plasma 51Cr-EDTA clearance correlated well with gold standard, even though those alternatives somewhat underestimated and overestimated gold standard, respectively.

Key Words: 사구체여과율, 측정방법

Glomerular filtration rate, Measurement method