106-04-23
內科醫學會 高醫

慢性腎臟病診斷上的迷思

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The implement of diagnostic and classification criteria of chronic kidney disease (CKD) by United States National Kidney Foundation in 2002 made it more convenient and clear in defining CKD populations. The original diagnostic criteria were based on estimate GFR, evidence of renal injuries, and time period of at least three months. With these criteria, the prevalence rate of CKD could be studied in different countries, and through community screening undiagnosed CKD population could be found out for further management. It significantly contributes to the progress of CKD. However, use of serum creatinine-based eGFR calculation still has potential bias due to differences in biological productions of creatinine from muscles, which influences the serum level of creatinine in different individuals, especially in those patients of old age with sarcopenia. For example, a CKD prevalence study from Taiwan revealed a 6.0% of CKD stage 3A (eGFR 45-60 ml/min/1.73m2), which was much higher than other stages, and CKD prevalence was high as 37.6% in people age over 65 years. It suggested that the mass of muscle, no matter due to sex or age factor, could significantly influence the eGFR value, and thus the prevalence of CKD, especially the stage 3A. Despites of the use of cystatin-based GFR equation will make the situation better, the high cost and low popularity made it difficult to be promoted.

Another factor is the quality of laboratory test of serum creatinine. Methods for creatinine measurement included Jaffe method, Folin-Wu method, enzymatic method, etc. All have their limitations in accurately measurement of true serum creatinine level, and thus influences the eGFR and subsequent diagnosis and classification of CKD.

Disease might have injury to renal glomerulus and tubules. The GFR are determined by the hemodynamic change within glomeruli and the Stariing forces of different component. A steady state of GFR is the basic requirement for measurement of renal function. Conditions involving acute and transient changes of GFR will also make a incorrect reading of GFR and results in misinterpretation of eGFR and diagnosis of CKD. There have been many countries to develop their own GFR equation through inulin or isotope-based methods in the past 10 years. It did not make the things clear but more confused.

In conclusion, characters of study population, muscle masses, calculation equations, laboratory methods could all have a potential effect on the result of CKD diagnosis and classification. Thus, eGFR calculated from different equations must be interpreted carefully and cautiously.