Estimated Glomerular Filtration Rate (eGFR)

Estimates how well the kidneys filter waste based on serum creatinine levels, age, sex, and race.

The glomerular filtration rate (GFR) serves as the most reliable indicator of glomerular function. GFR quantifies the volume of plasma filtered through the glomerulus per minute, expressed in milliliters; it essentially reflects the clearance of substances from the bloodstream. For a healthy adult male, the normal GFR ranges from 90 to 120 mL/min. However, this value can vary considerably with age. Research indicates that there may be a decline of approximately 7.5 mL/min/1.73m² after the age of 30 due to the aging process. Consequently, a healthy individual aged 70 may exhibit a GFR of around 60 mL/min/1.73m².

An ideal GFR marker should possess the following characteristics:

- It must be present in plasma at a consistent rate.
- It should be freely filtered by the glomerulus.
- It must not be reabsorbed or secreted by the renal tubules.
- It should not be eliminated through extrarenal pathways.

Since no endogenous marker currently meets these criteria, exogenous markers are employed for GFR assessment. The reference method for estimating GFR involves the use of inulin, a polysaccharide, which requires infusion followed by measuring blood levels after a designated time to calculate the inulin clearance rate. Other exogenous markers include radioisotopes such as chromium-51 ethylenediaminetetraacetic acid (51 Cr-EDTA) and technetium-99-labeled diethylenetriaminepentaacetic acid (99 Tc-DTPA). Among these, iohexol, a non-radioactive contrast agent, shows particular promise, especially in pediatric populations. The challenges associated with exogenous markers, particularly the necessity for testing to occur in specialized facilities capable of analyzing these substances, have led to an increased interest in the development of endogenous markers.

References

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