Renal Test: eGFR and Hyperkalemia

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Introduction

Understanding patient bloodwork for possible kidney dysfunction is an important concept in a TCM practitioner's education. It is essential to have a comprehensive view of patient care and know when to refer a patient to a specialist. This review examines eGFR and hyperkalemia to understand abnormal values and the potential causes of dysfunction.

Estimated Glomerular Filtration Rate

The estimated glomerular filtration rate (eGFR) is a calculated measurement to assess the kidney's ability to filter blood. In Pagana (2018), eGFR is calculated using serum creatinine levels, age, sex, and body size. Creatinine is a by-product of muscle breakdown or protein digestion, filtered by the glomerulus without reabsorption and a very accurate measurement of the kidney's ability to filter the blood (Mastenbjork, 2020). Low levels of eGFR are an indication of kidney disease. For instance, according to the National Kidney Foundation (2024), an average eGFR below 60 for three months indicates chronic kidney disease, yet some elderly patients can have low eGFR without kidney disease. According to the National Kidney Foundation, an eGFR below 15 indicates kidney failure. The following chart shows the normal levels of eGFR according to age (Mosby, 2018, p.175).

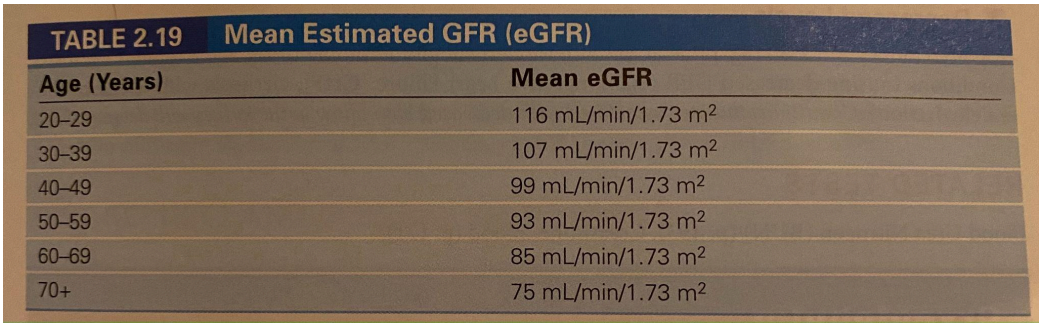

TABLE 2.19 Mean Estimated GFR (eGFR)

Age (Years)	Mean eGFR
20–29	116 mL/min/1.73 m^2
30–39	107 mL/min/1.73 m^2
40–49	99 mL/min/1.73 m^2
50–59	93 mL/min/1.73 m^2
60–69	85 mL/min/1.73 m^2
70+	75 mL/min/1.73 m^2

According to the National Kidney Foundation (2024), the eGFR rate is essential for the early detection of kidney disease as a lower-than-normal value can indicate the stage of chronic kidney disease. See Table 2.20 below. The eGFR is also used to calculate medication dosage (Pagana, 2018, p. 174). The National Kidney Foundation reports the following may affect eGFR: exercise, high meat consumption, age, pregnancy, obesity, and certain medications.

STAGES OF CHRONIC KIDNEY DISEASE		GFR*	% OF KIDNEY FUNCTION
Stage 1	Kidney damage with **normal** kidney function	90 or higher	
Stage 2	Kidney damage with **mild loss** of kidney function	89 to 60	
Stage 3a	**Mild to moderate** loss of kidney function	59 to 45	
Stage 3b	**Moderate to severe** loss of kidney function	44 to 30	
Stage 4	**Severe** loss of kidney function	29 to 15	
Stage 5	Kidney **failure**	Less than 15	

* Your GFR number tells you how much kidney function you have. As kidney disease gets worse, the GFR number goes down.

Table 2.20 (by National Kidney Foundation)

Recent Research

When searching Alt Health Watch, the most recent studies involving eGFR evaluated how well treatments worked on various diseases. For example, Chen and Zhang (2022) researched how effective Western medications in combination with TCM syndrome were when treating patients with hypertension and diabetes mellitus. In this study, eGFR was measured along with other bloodwork. Another study measured how well outpatient home nurse care

managed patients with chronic kidney disease (CKD) (Hu et al., 2022). In addition, Su et al. (2022) researched better tests to detect early kidney disease than eGFR calculation. In this study, 44 biomarkers were found as indicators of kidney failure. Research from the past two years revealed that quite a few studies have been using eGFR to evaluate the effectiveness of treatments in kidney disease.

Hyperkalemia

Another test for kidney disease is the electrolyte panel. According to the U.S. National Library of Medicine (n.d.), a routine electrolyte panel is usually part of a comprehensive metabolic panel that tests sodium, chloride, potassium, bicarbonate, calcium, magnesium, and phosphate levels in the blood. While electrolyte balance may be off for many reasons, it can also indicate kidney disease. If the kidney cannot filter the blood properly, electrolytes will build up in the blood, not being excreted. One such electrolyte imbalance is hyperkalemia (high potassium levels). Normal serum potassium levels are 3.5 - 5 meQ/l (Mastenbjork, 2020). Potassium balance is essential in cell function (moving products and water in and out), muscle and nerve function, and regulating heartbeat (Raman, 2023). Too much serum potassium can cause muscle weakness, an irregular heartbeat, difficulty breathing, nausea and vomiting, and numbness and tingling (Higuera, 2023). So, in addition to kidney disease symptoms, the patient may also have these symptoms with hyperkalemia.

Since high serum electrolytes can have life-threatening complications (especially with the heart), chronic kidney disease patients with hyperkalemia take medication to bring the

potassium levels down into the normal range, just as they would be on medication for kidney disease.

Recent Research

One study (Sevamontree et al., 2024) looked at the rate of hyperkalemia in outpatient care for patients because of the severe life risk and the burden on the healthcare system. In this study, the rate of outpatients with hyperkalemia was at expected levels and indicative of those levels seen in other countries. Another study looked at hyperkalemia in a woman with a rare disease called Gordon's syndrome (Manas & Singh, 2024). However, another study looked at high potassium levels and early detection of BRASH SYNDROME (Santos et al., 2024). Defined in this study, "BRASH syndrome consists of bradycardia, renal failure, atrioventricular nodal block, shock, and hyperkalemia. Research in the past two years shows that high potassium appears in several severe diseases and is a measurement used in much research.

Conclusion

This review evaluated eGFR and hyperkalemia tests in kidney disease. The research shows that these values are also measured in relation to other diseases and conditions. Understanding abnormal values will help alternative medicine providers refer patients to the relevant practitioner, understand the disease's complexity, and guarantee the most accurate TCM diagnosis and treatment to facilitate the patient's quality of life.

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