

The impact of utilising the Kidney Failure Risk Equation for referral into secondary care for individuals with chronic kidney disease in the UK

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Introduction: The 2014 National Institute for Health and Care Excellence (NICE) CKD guideline criteria for referral to secondary care nephrology are predominantly based on estimated Glomerular Filtration Rate (eGFR). For many individuals, however, eGFR is not a strong determinant of progression to end-stage renal failure (ESRF), the major reason for patient monitoring and management in secondary care. The 4-variable Kidney Failure Risk Equation (KFRE) incorporates eGFR with the important co-variables for risk of ESRF of age, gender, and albumin-to-creatinine ratio (ACR). The KFRE has very high sensitivity and specificity for risk of ESRF, including validation in UK cohorts. A KFRE of >3% at 5-year is being used to triage patients referred from primary care to secondary care in routine clinical practice in Canada. We performed a population based study to assess the impact of using KFRE to improve the precision of referral of patients in the UK.

Methods: The Health Improvement Network (THIN) database was used to identify all individuals registered in primary care with confirmed stage 3-5 CKD between 1st Jan 2016 and 31st March 2017, based on a CKD-EPI eGFR calculated on at least two serum creatinine (sCr) results with the second sCr available >90 days prior to or after the index sCr. The KFRE was calculated for all patients with confirmed stage 3-5 CKD. We excluded patients who were pregnant, or receiving treatment with renal replacement therapy, or with an eGFR <10 ml/min/1.73m².

Results: 3,146,563 adults were analysed; 27.9% (878,569) had two sCr tests, 3.4% (107,962) had confirmed stage 3-5 CKD and no exclusion criteria. Only 40% of individuals with stage 3-5 CKD had an ACR done in the study period, so imputation was used for missing data. Of the included patients, whilst 16.5% (n=17,837) had a >3% 5-year ESRF risk by the KFRE, 38.6% (6,877) of these did not fulfil NICE criteria for referral; conversely, whilst 16.8% (18,137) fulfilled NICE guideline criteria, only 60.4% (10,960) of these patients had a 5-year risk of ESRF of >3%. Findings were similar in complete case analysis and in analysis with multiple imputation.

Conclusion: At a population level almost four in 10 patients with a 5-year ESRF risk >3% do not fulfil NICE criteria for referral to secondary care; conversely almost four in 10 patients who fulfil NICE criteria have a 5-year risk of ESRF <3%. Using the KFRE in the UK at a >3% 5-year ESRF risk threshold would lead to redesignation of care for 48.3% of all those identified by the current NICE Guideline or a >3% 5-year ESRF risk. These data have major implications for patient communication, clinical outcomes, resource utilisation, and health economics. The current lack of precision of referral guidelines, reinforced by poor ACR monitoring rates, may be the most important quality improvement shortfall in kidney care in the UK: introduction of the KFRE in the UK is a major opportunity to address this.