What is the most reliable score to predict progression of chronic kidney disease to ESRD in older patients with CKD stage 3b or higher (eGFR < 45 ml/min/1.73 m²)?

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European Renal Best Practice Guidelines

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Introduction

The prevalence of CKD increases sharply with age such that almost 50% of people aged over 70 years are affected, but only a minority progress to end-stage kidney disease. It is therefore important to have an accurate method to predict risk of progression in older people so that high risk persons can be identified early to allow adequate time for preparation for possible renal replacement therapy (RRT) whereas those at low risk can be spared unnecessary preparation. We therefore sought to identify the most reliable risk prediction equation for use in older people.

Methods

We conducted a systematic literature search in PubMed and MEDLINE. “Eldery” was defined as older than 65 years; progression of CKD was defined as progression to CKD stage 5 (category G5), a point which would generally prompt initiation of discussion regarding possible RRT in the elderly. The abstracts of all papers were assessed independently by two assessors. Differences were resolved by discussion. From the initial search papers were identified for detailed review and data extraction.

Results

The literature search identified 960 papers, 64 were selected for detailed review and 11 for data extraction (Table). Two were excluded because they included participants without CKD (5,6). After data extraction, we identified 3 prospective (1,2,4) and 6 retrospective (3, 7-11) cohort studies that aimed to identify risk factors and/or develop a risk prediction score for progression to ESKD in predominantly older people. All of the prospective studies and two retrospective studies (7,9) were excluded from further consideration because they did not attempt to develop a risk prediction score. A further retrospective study was excluded due to significant selection bias and missing data (8). A retrospective study that included data from predominantly male patients at a Veterans Administration (VA) Medical Centre performed well but did not include a measure of proteinuria and has not been validated in general populations (3). The Kidney Failure Risk Equation (KFRE) was developed in Canadian adults who were referred to Nephrologists with eGFR 10-59 ml/min/1.73 m². The 8-variable KFRE achieved excellent discrimination in development (C statistic=0.917) and validation cohorts (C statistic=0.841) and a 4-variable KFRE performed almost as well (10). The KFRE has recently been validated in a large dataset (CKD Prognosis Consortium) that included 721,357 individuals with CKD Stages 3-5 from 31 cohort studies. The 4-variable KFRE achieved excellent discrimination in development and validation with C statistic of 0.90 at 2 years and 0.88 at 5 years. Discrimination was similar in subgroups aged ≥65 years versus younger for both the 4- and 8-variable KFRE. To improve calibration in non-American populations, a correction factor was applied. Further subgroup analysis confirmed good discrimination in people aged ≥65 years with eGFR<45ml/min/1.73m² (11).

Conclusion

We recommend that the 4-variable Kidney Failure Risk Equation (KFRE) predicts the risk of progression of CKD to ESRD in older patients at stage 3b or higher (GFR<45ml/min/1.73m²), sufficiently well to be a useful aid to shared decision making (1B).