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VALIDATION OF THE BANSAL AND WEISS MORTALITY SCORES IN THE MRC OLDER AGE STUDY

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Introduction

Older patients with chronic kidney disease (CKD) are at a high risk of death. Recently, two mortality risk scoring models incorporating age, kidney function and markers of other underlying comorbidity have been published for this target population (Bansal et al, CJASN 2015, and Weiss et al, JAGS, 2015). The aim of this analysis was to examine the performance of the Bansal and Weiss Scores in older people with CKD aged 75+years.

Methods

Data derive from the Medical Research Council's (MRC) study of assessment of older people. This study recruited 15,336 participants from 53 UK general practices between 1994 and 1999. Analyses were based on participants with either a CKD-EPI estimated glomerular filtration rate (eGFR) <60ml/min/1.73m^2 or positive dipstick proteinuria without evidence of urinary tract infection and full baseline data for calculation of the respective risk scores (Figure 1). Follow-up for mortality was done by the Office of National Statistics.

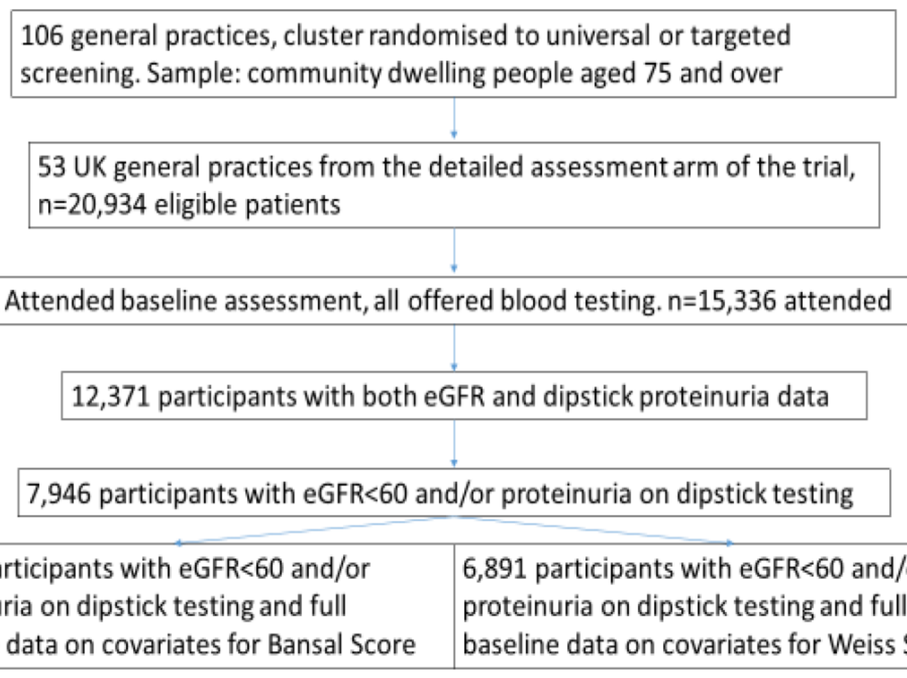

Fig. 1 Flow chart of study participants contributing data to this study.

Shortness of breath talking or leg swelling in the morning was defined as a proxy of potential heart failure. Risk scores were calculated for both the Bansal and the Weiss Score. For the Weiss Score 'not using statins' and 'total number of anti-hypertensives used' were not taken as predictor variables as the dataset predated practice changes with regards of routine statin use and hypertension treatment at this age.

Baseline characteristics	Participants with CKD n=7,946	Participants with eGFR<45ml/min/1.73m^2 n=2,657
Female, n (%)	5,319 (66.9 %)	1,913 (72.0%)
Age, years, mean (SD)	82 (4.8)	83 (5.1)
Diabetes, n(%)	639 (8.0%)	251 (9.5%)
Current smoker, n(%)	837 (10.6%)	267 (10.1%)
Ex smoker, n(%)	3,774 (47.6%)	1,223 (46.2%)
Previous stroke, n(%)	751 (9.5%)	329 (12.5%)
Potential heart failure, n(%)	768 (9.7%)	319 (12.1%)
Bansal score, median(IQR)	5 (4, 7)	7 (5, 8)
Weiss score, median(IQR)	104 (75, 134)	108 (76, 139)

Table 1 Description of study participants contributing data to this study.

For each risk score, a high risk, medium risk and low risk group were created. Partial validation was carried out using predicted population averaged survival curves in these risk groups using Cox proportional hazards models (Royston, 2015). Sensitivity analyses were carried out using only participants with eGFR<45ml/min/1.73m^2

Results

The mean age of participants was 82 years, with the majority being women (Table 1). The Bansal score was easier to derive, and identified more people at higher mortality risk (Groups 2&3). Generally both scores performed well.

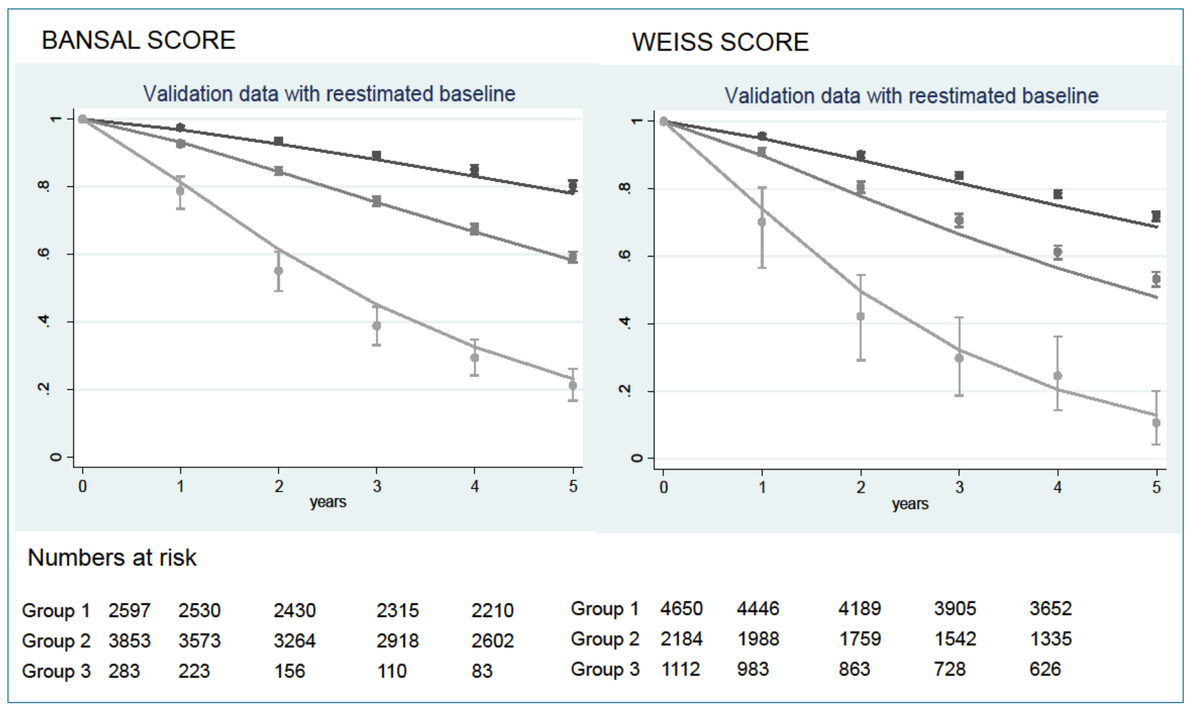

Fig. 2 Partial calibration using prognostic indices evaluated on participants with eGFR<60 and/or proteinuria on dipstick testing, with re-estimation of the baseline cumulative hazard function. Smooth lines represent predicted survival probabilities, and vertical capped lines Kaplan-Meier estimates with their 95% confidence intervals.

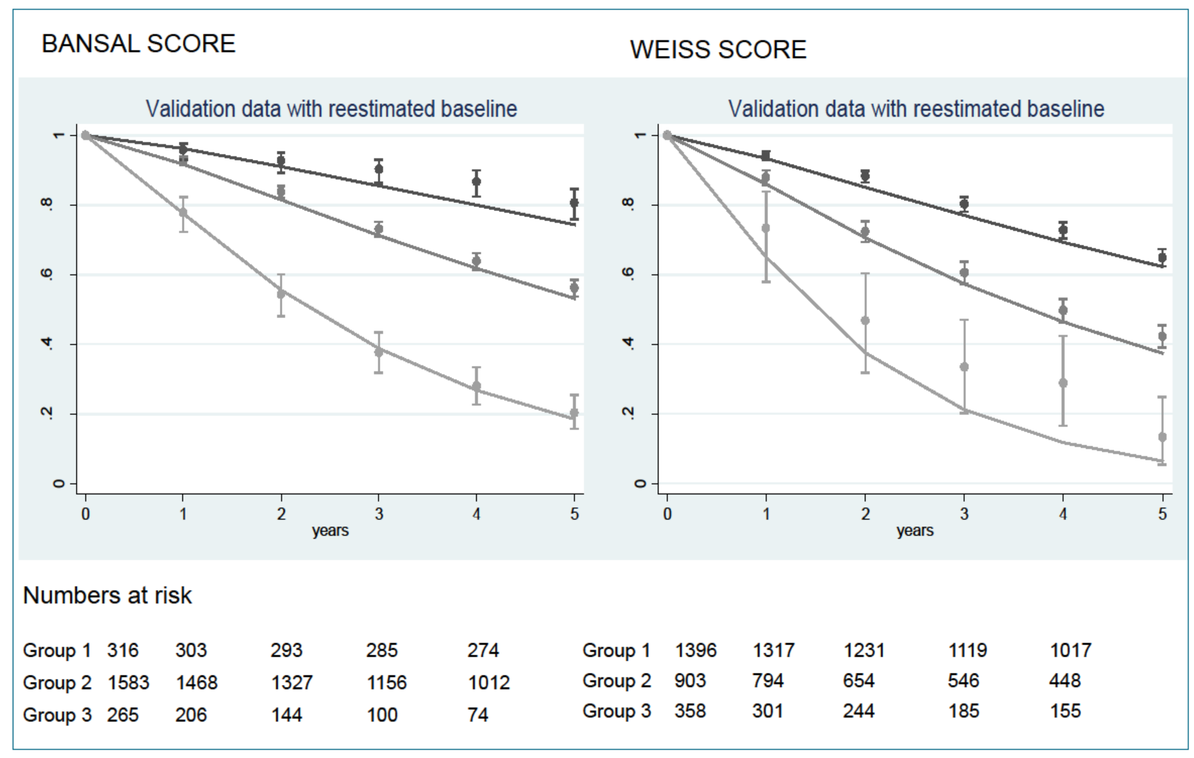

Fig. 3 Partial calibration using prognostic indices evaluated on participants with eGFR<45, with re-estimation of the baseline cumulative hazard function. Smooth lines represent predicted survival probabilities, and vertical capped lines Kaplan-Meier estimates with their 95% confidence intervals.

In the sensitivity analyses using only those with eGFR<45, the Bansal score had greater accuracy in identifying those at highest risk of death (group 3), whilst the Weiss score predicted somewhat worse long term outcomes than observed in the data.

Strengths and Limitations

+ Large representative general UK population data

- Only one eGFR/urine test available at baseline
- Data predate current practices with regards to statin prescription, and current management of heart failure and hypertension in older people.

Conclusions

Both published risk prediction scores showed overall a good performance in participants of the MRC older age study.

References

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