Scale and Costs of Introducing Cystatin-C eGFR Calculations to UK Primary Care

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Background

CKD-EPI eGFR and cystatin-C are better predictors of development of ESRF and cardiovascular events[1,2]. Their use has been recommended in recent CKD guidance including the UK[3]. The cost impact for primary care has not been studied in depth.

Aim

We evaluated the potential impact on CKD diagnosis of the CKD-EPI formula and subsequent cost of cystatin-C in a large UK primary care CKD cohort.

Methods

We used the baseline cohort from the PSP-CKD study, to study the reclassification rates of CKD using MDRD and EPI formulae. We then calculated the cost of performing cystatin-C on the eligible population.

PSP-CKD Cohort Characteristics

The records of 353,256 individuals were analysed by IMPAKT, a primary care CKD audit and research tool, to create the PSP-CKD cohort. The cohort consists of:

- 31,274 individuals with 1 MDRD eGFR<60 ml/min/1.73m²
- Mean MDRD eGFR of 51.1 ml/min/1.73m² (SD 9.1)
- 69.9% of individuals had no coded history of cardiovascular disease
- Mean blood pressure was 134/75 mmHg
- 65% had known hypertension
- 19% had known diabetes mellitus

Results

Rechecking and Reclassification of eGFR

10,141 (33.5%) individuals required another eGFR measurement to confirm their diagnosis of CKD. Within this group, 1,086 (11.1%) were reclassified to an EPI eGFR ≥60. This group were also less likely to have their urine assessed for proteinuria.

Only 3.3% of individuals with two MDRD eGFRs<60 were reclassified to an eGFR ≥60 when using the EPI formula (p<0.001 compared to those with a single MDRD<60).

Reclassification	1 MDRD<60	≥2 MDRD<60	Whole Cohort
EPI<60	8,689	18,909	27,598
EPI≥60	1,086 (11.1%)	662 (3.3%)	1,748 (6.0%)
No serum creatinine*	366	595	961
Total	**10,141**	**20,166**	**30,307**

Table 1 (above): Reclassification of CKD using EPI equation. *Where only an MDRD eGFR but no serum creatinine was available a conversion to EPI eGFR was not made.

Eligibility for Cystatin-C

Further analysis of the 20,166 Individuals with confirmed MDRD CKD showed that 12,142 (60.2%) had EPI CKD stage 3A. 7,153 (58.9%) had stage A1 proteinuria and were therefore eligible for cystatin-C assessment.

Population Group	N	% Adults	% of Group Above
Assessed for Study	353,256	-	-
1 MDRD<60	30,307	8.6%	8.6%
≥2 MDRD<60	20,166	5.7%	66.5%
EPI<60	18,909	5.4%	93.8%
EPI 3A	12,142	3.4%	64.2%
Eligible for Cystatin-C (Proteinuria A1)	7,153	2.0%	58.9%

Table 2 (above): Estimation of population proportion CKD reclassifications and eligibility for cystatin-C.

Extrapolating across the UK, 1,000,000 (2.0%) adults could be eligible for a cystatin-C blood test. At a conservative cost of £5.50 (€7.50) per test, the initial cost of implementing cystatin-C testing would be £5.5 million (€7.5 million). This estimate does not include costs of interpretation, consequent changes to clinical management or inappropriate tests.

Conclusions

Over a third of individuals in UK primary care with a MDRD eGFR<60 require a second confirmatory test. 3.3% of individuals would be reclassified to not having CKD on the basis of using the EPI eGFR formula instead of MDRD. Overall, 2.0% of adults would require a cystatin-C measurement based on their eGFR and proteinuria assessment. For the whole UK, implementation in line with recent guidance would cost £5.5 (€7.5) million.

References
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This research was funded by the National Institute for Health Research Collaboration for Leadership in Applied Health Research and Care (NIHR CLAHRC) East Midlands at Nottinghamshire Healthcare NHS Trust. The views expressed are those of the author(s) and not necessarily those of the NHS, the NIHR or the Department of Health.

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53 ERA
Chronic Kidney Disease. Clinical Epidemiology.
Rupert Major
DOI: 10.3252/pso.eu.53era.2016
ePosters supported by F. Hoffmann- La Roche Ltd.