PREDICTION OF SIGNIFICANT EVENTS ON A CKD COHORT BY GFR ESTIMATES BASED ON A CREATININE OR CYSTATIN C

Sofia Santos[1], Jorge Malheiro[1], Andreia Campos[1], Sofia Pedroso[1], Josefina Santos[1], António Cabrita[1]
[1]Hospital Santo António Centro Hospitalar Porto, Portugal

INTRODUTION: Plasma cystatin C has been shown to be superior to plasma creatinine for the estimation of adverse clinical outcomes, specifically cardiovascular morbidity and mortality.

AIM: investigate eGFR using formulas based in plasma cystatin C and creatinine; their relationship with end stage renal disease (ESRD) and death prediction.

METHODS:

Cystatin C and creatinine were measured in 234 patients with CKD.
For each patient eGFR was calculated:

- Modification Diet Renal Disease4 formula (MDRD) for creatinine;
- Steven's and Rule's formulas based on Cystatin C (Cyst_St and Cyst_Rule, respectively).

They were followed for 50.6±17.7 months for the occurrence of a predefined endpoint event: need for renal replacement therapy or death.

Receiver operating characteristics (ROC) analyses and reclassification analysis were performed to explore prediction ability for each marker for events evaluated.

3 groups of patients were created:

- those reclassified for a higher eGFR percentile by Cyst_St or Cyst_Rule vs MDRD
- those reclassified for a lower eGFR percentile by Cyst_St or Cyst_Rule vs MDRD
- those without reclassification

These 3 groups were compared by the logrank test for event occurrence (death or ESRD). Furthermore, patients reclassification status as event predictor, considering patients without reclassification as reference, were explored by Cox regression adjusted for sex, diabetes, hypertension, proteinuria >0.3g/g and previous cardiovascular disease.

RESULTS:

75% of the population was classified in CKD 35 (by MDRD).
47 events were recorded: 27 deaths and 20 ERSD.

Table I.	No event (NE) (n=187)	Event (E) (n=47)	*P*-v
Female	42.2%	53.2%	0.177
Age	60.9±19.5	72.1±11.4	<0.001
Diabetes	32.1%	61.7%	<0.001
Hypertension	82.9%	91.5%	0.144
Cardiovascular disease	25.4%	29.8%	0.542
Proteinuria >0.3g/g	42.2%	61.7%	0.017
Creatinine	1.44±0.57	2.07±0.82	<0.001
Cystatin C	1.29±0.54	1.98±0.74	<0.001
eGFR MDRD-4	55.4±29.4	34.2±20.8	<0.001
eGFR Cyst_Rule	69.7±34.9	41.1±19.8	<0.001
eGFR Cyst_St	67.3±36.5	37.9±18.5	<0.001

ROC analyses for prediction of death showed Cyst_St having the highest area under de curve (AUC 0.731; p<0.001), followed by Cyst_Rule (AUC 0.722; p<0.001) and MDRD (AUC 0.657; p=0.008).
ROC analyses for prediction of ESRD showed MDRD having the highest AUC (0.824), and both Cystatin based formulas with the same AUC (0.786), all with p<0.001.

Table II. Reclassification analysis_ Death Event	No event at 60 months	logrankP	Hazard ratio	Cox P
MDRD-4 = Cyst_Rule (N=88)	83%	reference		reference
MDRD-4 > Cyst_Rule (N=73)	79.4%	0.190		0.939
MDRD-4 < Cyst_Rule (N=73)	96.1%	0.112	0.271	0.039
MDRD-4 = Cyst_St (N=79)	78.7%	reference		Ref
MDRD-4 > Cyst_St (N=76)	79.6%	0.464		0.539
MDRD-4 < Cyst_St (N=79)	98.2%	0.008	0.156	0.007

For the event ESRD there were not significantly differences between the three formulas.

CONCLUSIONS: Death prediction was improved with the reclassification of kidney function by cystatin C formulas. ESRD prediction was similar between reclassification groups. Although the link between cystatin C and mortality goes beyond kidney function, it brings significant impute in the clinical risk stratification of an elderly CKD population as ours.

BIBLIOGRAPHY:

Rogacev el atl; *The CKD-EPI equation incorporating both cystatin C and creatinine best predicts indiviudal risk: a cohort study in 444 patientes with chronic kidney disease*; Nephrol Dial Transplant (2013) 0: 1-9. Delanaye et al; *The applicability of eGFR equations to different populations*; Nature Reviews Nephrology (2013) 9, 513-522. Peralta el al; *Cystatin C identifies Chronic Kidney disease patiets at Higher risk for complications*; J Am Soc Nephrol (2011) 22:147-155. Inker et al; Estimating glomerular filtration rate for serum creatinine and Cystatin C. N Engll J Med (2012) 367: 20-29;

51ERA-EDTA
160-SP
H) Clinical Nephrology, CKD. H1) Lab methods, progression & risk factors for CKD 1-5, nutrition in CKD, renal diseases (except GNs and cystic diseases).
Sofia Santos
DOI: 10.3252/pso.eu.51era.2014
Poster presented at: