Reclassification of Severe Renal Failure using modified KDIGO Classification

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Background:

Chronic kidney disease (CKD) has emerged as an important health concern for people living with HIV (PLWH). Preventing long-term kidney toxicity from antiretroviral therapy is therefore critical[1].

Clinicians can use several monitoring tools, routine measurements of proteinuria or estimated glomerular filtration (eGFR) or the KDIGO risk score (Kidney Disease: Improving Global Outcomes), to identify high-risk individuals who may require an intervention and prevent adverse outcomes of morbidity and mortality[2].

Methods:

This is a single centre cohort study of consecutive PLWH attending a variety of clinics at a metropolitan hospital. We retrospectively analysed the results of 111 PLWH, 104 of whom had an eGFR performed and of those, 94 patients had a urinary Protein Creatinine Ratio (PCR) performed. We then re-categorised according to the modified Kidney Disease Improving Global Outcomes (KDIGO) 2012 classification, replacing Albumin Creatinine Ratio (ACR) with PCR (Table 1.) We also aimed to see if there was a correlation between high blood pressure and proteinuria

Table 1. Grading of Proteinuria. Adapted from Table 7: Relationship among categories for albuminuria and proteinuria. KDIGO 2012 Clinical Practice Guideline for the Evaluation and Management of Chronic Kidney Disease

Measure	Normal to mildly increased (A1)	Moderately increased (A2)	Severely increased (A3)
ACR (mg/mmol)	< 3	3 – 30	> 30
PCR (mg/mmol)	< 15	15 - 50	> 50
Protein reagent strip	Negative to trace	Trace to +	+ or greater

Results:

The study population included 111 PLWH, 30 (27%) females and 81 (73%) males with a mean age of 49.6yrs (±11.4) and mean BP of 138.1/84.5mmHg (±17.7/11.9). High blood pressure (>140/90mmHg) was found in 44 patients (39.6%); 26 (23.4%) of whom were known hypertensive on treatment, however 11 (42.3%) patients were poorly controlled. Hypercholesterolaemia (total cholesterol >5.0mmols) was present in 40 (38.9%) PLWH .

Table 2. Severity of Proteinuria and correlation with High Blood Pressure.

PCR	mg/mmol	Number	High BP	Percentage
Normal	<15	67	32	47.8%
Moderate	15-50	21	7	33.3%
Severe	>50	6	2	33.3%
	Total	94	40	42.6%

Table 3. Traditional grading of severity of Chronic Kidney Disease using non-ethnically adjusted eGFR and correlation with High Blood Pressure.

CKD	eGFR	Number	High BP	Percentage
G1	>90	42	13	31.0%
G2	60-89	53	17	32.1%
G3a	45-59	7	4	57.1%
G3b	30-44	2	2	100.0%
G4	15-29	0	0	0.0%
G5	<15	0	0	0.0%
	TOTAL	104	36	34.6%

Table 4. Modified KDIGO Table using PCR against eGFR re-risk stratifying severity of chronic kidney disease by percentage.

		Proteinuria		
CKD Grading	eGFR	P1	P2	P3
G1	>90	28.7%	9.6%	1.1%
G2	60-89	40.4%	7.4%	4.3%
G3a	45-59	1.1%	5.3%	0.0%
G3b	30-44	1.1%	0.0%	1.1%
G4	15-29	0.0%	0.0%	0.0%
G5	<15	0.0%	0.0%	0.0%

Table 5. Estimated prevalence of chronic kidney disease using KDIGO classification using our London HIV population against a Japanese HIV Population[3] .

	Prevalance of CKD	
Risk	London	Japan
Low	69.1%	85.9%
Moderate	18.1%	11.0%
High	11.7%	2.1%
Very High	1.1%	1.0%

Discussion:

In a sub group analysis there was no significant correlation between those with proteinuria and those with high blood pressure.

Using the Modified KDIGO classification we were able to reduce the number of PLWH classified as at very high risk of developing CKD who would require intervention, however the number at high risk who would require closer monitoring increased.

Compared to a Japanese cohort we have higher attrition rate of CKD in our HIV population . They analysed 1,447 PLWH, (97% males; 3% female) with an average age of 44.4 years. A reason for the higher prevalence of CKD between the populations is likely due to the eGFR not accounting for Afro-Caribbean ethnicity.

Conclusions:

We have demonstrated that urinary PCR and eGFR alone are poor discriminators of CKD. The combined use of both, as suggested by the KDIGO guidelines can be used easily and the results may provide a more accurate picture of risk due to kidney disease.

In our cohort we were not able to demonstrate a strong correlation between proteinuria, kidney disease and high blood pressure.

In the future we propose to repeat our analysis with a larger number of patients and account for ethnicity using the Modified KDIGO classification.

Conflicts of Interest: None declared

References:

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