

Impaired Renal Function of Patients Initiating HAART in Two Developing Countries

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Background

HIV-related nephropathy is well-known in developed countries but few data are available from developing countries. Certain anti-retroviral drugs have renal toxicity and/or need dose adjustment in those with significant declines in renal function. Creatinine measurement is often not available, particularly in peripheral health centers where scale-up of anti-retroviral therapy (ART) is on-going. Surrogate markers of renal insufficiency, such as the measurement of proteinuria by urine dipstick, would prove useful in a resource-poor setting.

Methods

In Arua (Uganda), 195 anti-retroviral naïve adult patients with a CD4 count < 200 cells/ml or WHO Stage 4 HIV disease prospectively underwent serum creatinine (Cr) testing and urine protein determination by dipstick prior to initiation of ART. In Guatemala City (Guatemala), baseline serum creatinine levels done prior to the start of ART (using same entry criteria as in Arua) for the most recent 200 adults enrolled in the program were retrospectively collected. Patient age, weight, and gender were noted in both groups. Cr was measured by automated colorimetry. Creatinine clearance (CrCl) was estimated using the Cockcroft-Gault equation, with correction factor of 0.85 used for female patients. Level of proteinuria was visually determined by dipstick color change and reported as 0, 1+, 2+, or 3+.

Results

Historically, mean CD4 count at the initiation of ART is 88 (IQR:39-142) and 87 (IQR:35-162) cells/ μ l in Arua (n=1499) and Guatemala City (n=688), respectively.

A CrCl of <50 ml/min was found in 43% (83/195) of the patients in Arua and in 19% (37/200) of the patients in Guatemala City. In Arua, among the 155 patients with a

negative urine dipstick, 61 (39.3%) had a CrCl <50; in 40 patients with any proteinuria (1+ to 3+), 22 (55%) had a CrCl <50 (p=0.075).

	Arua (n=195)	Guatemala City (n=200)
M:F	0.70	1.41
Mean age, y (range)	36.0 (19-62)	35.2 (18-69)
Mean weight, kg (range)	52.3 (37-106)	52.9 (33-96)
Mean serum Cr, mg/dl (range)	1.30 (0.9-3.8)	1.06 (0.6-4.1)
Mean CrCl, ml/min (range)	53.9 (18.4-95.2)	72.6* (13.3-158.2)
CrCl < 50 ml/min (n)	43% (83)	19%* (37)

*p<0.001

Conclusions

- Impaired renal function can be highly prevalent in resource-limited settings.
- Renal dysfunction, as estimated by a creatinine clearance of less than 50 ml/min, is significantly more prevalent in the Ugandan compared with the Guatemalan cohort
- Proteinuria, as measured by urine dipstick, did not appear useful for predicting renal insufficiency.
- Treatment simplification strategies for scaling up in developing countries could be affected by the need to adapt ART regimens

and dosing based on renal function, as would the need for laboratory follow-up when using first-line agents with possible renal toxicity.