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Estimating renal impairment and evaluating antiretroviral dose adjustments among HIV-positive patients: a comparison of three hospitals

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Purpose of the study

As HIV-positive patients are now surviving longer, they are exposed to an increasing number of risk factors for chronic renal failure (CRF) including HIV itself, aging and co-morbidities such as hypertension, diabetes and vascular disease. This necessitates an increased awareness of potential CRF by both HIV clinicians and pharmacists [1,2].

The purpose of this study was to estimate prevalence of renal impairment in a randomly selected group of HIV-infected patients at three hospital outpatient clinics (one Melbourne, two London) and to analyse antiretroviral (ARV) dosing in those patients found to have renal impairment; by comparing published dosing recommendations with actual dosing.

Methods

Patients were selected randomly from outpatient ARV prescriptions dispensed in pharmacy. Two serum creatinine samples taken at least 6 months apart were reviewed for each patient. Creatinine clearance (CrCl) was estimated firstly using the Modification of Diet in Renal Disease formula (eGFR). Patients with an eGFR of <60 mL/min were reviewed further by estimating CrCl using the Cockcroft-Gault (CG) formula. Patients with both CG CrCl measurements <50 mL/min, which may require ARV dosage adjustment, were checked against pharmacy dispensing records to see if the appropriate dose had been prescribed.

Summary of results

Patient cohorts included Alfred Hospital (n = 200), St Mary's Hospital (n = 225) and Chelsea & Westminster Hospital (C&W, n = 197). Total number of patients included was 622. Results showed that overall 21 (3.4%) and 19 (3.1%) patients had a CrCl of <60 mL/min using eGFR and CG, respectively. Dosage adjustments were required in 13 patients, but were only made in five patients. Antiretrovirals concerned included lamivudine, emtricitabine and tenofovir. Of the eight patients who failed to have dosage adjustments made, seven were taking a combination product, either Truvada® or Kivexa®. Some patients were on more than one ARV drug requiring dose adjustment. (Tables 1 and 2.)

Conclusion

Although eGFR is now clinically regarded as the new standard for measuring renal impairment, dose adjustment recommendations for ARV drugs are based on CG estimates. With the introduction of fixed dose combina-

Table 1: Patient demographics.

	Alfred	St Marys	C&W
Number of patients	200	225	197
Median age in years (range)	46 (22–81)	42 (17–76)	45 (18–76)
Male (%)	184 (92)	175 (78)	173 (88)
Race: non-Black (%)	196 (98)	154 (68.4)	169 (85.8)

Table 2: Results.

	Alfred	St Marys	C&W	Overall
Number of patients	200	225	197	622
eGFR <60 mL/min/1.73 m2	7 (3.5%)	6 (2.7%)	8 (4.1%)	21 (3.4%)
CG <60 mL/min	5 (2.5%)	6 (2.7%)	8 (4.1%)	19 (3.1%)
CG <50 mL/min requires ARV dose adjustment	5 (2.5%)	3 (1.3%)	5 (2.5%)	13 (2.1%)
Number of patients prescribed correct adjusted ARV dose if required	3 (60%)	1 (33%)	1 (20%)	5 (38%)
No. of patients on lamivudine requiring dose adjustment	5 (2 adjusted)	1 (0 adjusted)	3 (0 adjusted)	9 (2 adjusted)
No. of patients on emtricitabine requiring dose adjustment	0	1 (0 adjusted)	2 (1 adjusted)	3 (1 adjusted)
No. of patients on tenofovir requiring dose adjustment	2 (2 adjusted)	2 (1 adjusted)	2 (1 adjusted)	6 (4 adjusted)

tions, pharmacists should be aware that drug dose adjustment may require use of individual drugs and liquid formulations. Further work needs to be undertaken in individual units to develop a system for identifying patients who require careful renal monitoring and subsequent dosage adjustment. The result of not adjusting doses when required needs to be studied.

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