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P375 -Cockroft-Gault vs CKD-EPI for estimating GFR when dosing aminoglycosides

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Introduction

Despite international guidance supporting use of the Chronic Kidney Disease Epidemiology Collaboration (CKD-EPI) equation for estimating glomerular filtration rate (GFR), and increasingly widespread use of CKD-EPI in pathology reporting services, many local trust guidelines continue to use the Cockcroft-Gault (CG) equation for aminoglycoside dosing.

We have concerns about the ongoing use of the CG equation for dosing aminoglycosides, in part due to its inaccuracy (and therefore incorrect dosing calculations) and in part due to its over-complication of a process that should be kept as straightforward as possible when dealing with sick patients, often in an emergency setting.

Our aim was therefore to audit aminoglycoside dosing calculations in acutely unwell medical patients and compare the doses calculated using the CG equation for estimating GFR (as per our local trust guidance) with doses calculated using the CKD-EPI equation.

Methods

We carried out a prospective audit of all patients admitted under acute medicine over a one-month period and receiving at least one dose of an aminoglycoside antibiotic. Patients with an acute kidney injury were excluded.

Results

34 patients were included (median age 78; 65% female). 29 patients (85%) received Amikacin and 5 (15%) received Gentamicin. Signs of sepsis were present in 20 patients (59%). 14 patients (41%) had Chronic Kidney Disease (CKD) (eGFR <60 ml/min/1.73m²). 26 patients (75%) received their first dose of aminoglycoside in the emergency department with the remaining being given on the acute medical unit. CG GFR was calculated (by a pharmacist or a doctor) prior to the first dose of aminoglycoside in only 10 patients (29%). Dosing errors were made in the treatment of 11 patients (32%).

Use of the CKD-EPI equation to estimate GFR would have resulted in 13 patients (38%) receiving a higher dose of Aminoglycoside than they would have received using the CG equation. 9 of these 13 patients (69%) had CKD. The median dose increase using the CKD-EPI equation was 33% (range 25-50%).

Discussion

Our data suggest that using the CG equation to estimate GFR when calculating aminoglycoside doses results in under-dosing of these antibiotics. Furthermore, in practice CG-estimated GFR is not being calculated in the majority of patients before they receive their first dose of an aminoglycoside resulting in frequent

dosing errors, and raising safety concerns about the use of different equations for laboratory reporting and dosing calculations.

We therefore propose that when prescribing aminoglycosides, CKD-EPI should be used for dosing calculations.