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Effect of Cefepime drug dosing by cystatin C based eGFR

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Objectives: Cefepime requires renal dose adjustment, but the recommended dose may vary by 4-6 times even in the same renal function depending on the purpose of use. Elderly patients hospitalized with pneumonia are likely to have decreased muscle mass, and have possibilities of drug overdosing due to overestimation of Cr-based eGFR. In this study, we investigated the treatment outcome and adverse event of drug dosing according to cystatin C-eGFR in patients who were prescribed cefepime for pneumonia.

Methods: The patients who were hospitalized for pneumonia and treated with cefepime between July 1, 2016 and December 31, 2018. Among those, 72 patients with both Cr-eGFR and cystatin C-eGFR, information about AKI, neurologic complications, 30-day mortality, and in-hospital mortality were collected.

Results: 46 patients were administered adequate dose for anti-pseudomonas coverage of cefepime based on cystatin C-eGFR and 26 patients were administered higher dose. The incidence of AKI was tended to high in the high dose group (57.7% vs. 28.3%, P=0.076). In patients who were given cefepime for more than 7 days, severe AKI (stage 2-3) occurred significantly more in the high dose group (26.7% vs. 3.3%, P=0.036). In multivariate analysis with peak CRP level, a difference between Cr-eGFR and cystatin C-eGFR (ΔGFR) and total cumulative dose of cefepime, the peak CRP level (HR 1.011, 95% CI 1.001-1.021, P=0.028) and the larger ΔGFR (HR 1.072, 95% CI 1.021-1.126, P=0.005) were related with the occurrence of severe AKI. In tree analysis, severe AKI was related with shock (P = 0.006) and high dose group (P = 0.017). Neurologic complications or death-related outcomes of pneumonia treatment were not significantly different between the two groups.

Conclusions: There was no significant difference in treatment outcome among patients who were dosing properly with cefepime based on cystatin C-eGFR. However, severe renal impairment occurred in high dose patients.