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Optimal amikacin levels for patients with sepsis in intensive care unit of Cipto Mangunkusumo Hospital, Jakarta, Indonesia

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Abstrak

Background: Amikacin is one of the antibiotics of choice for sepsis and septic shock. Pharmacokinetic of amikacin can be influenced by septic condition with subsequent effect on its pharmacodynamic. At Cipto Mangunkusumo Hospital (RSCM), Jakarta, adult patients in the ICU were given standard amikacin dose of 1 g/day, however the achievement of optimal plasma level had never been evaluated. This study aimed to evaluate whether the optimal plasma level of amikacin was achieved with the use of standard dose in septic conditions.

Methods: all septic patients admitted to the intensive care unit of a national tertiary hospital receiving standard dose of 1g/day IV amikacin during May-September 2015 were included in this study. Information of minimum inhibitory concentration MIC was obtained from microbial culture. Cmax of amikacin was measured 30 minutes after administration and optimal level was calculated. Optimal amikacin level was considered achieved when Cmax/MIC ratio >8.

Results: average Cmax achieved for all patients was 86.4 (43.5-238) µg/mL with 87% patients had Cmax of >64 µg/mL.MIC data were available for 7 of 23 patients. MICs for identified pathogens were 0.75 - >256 µg/mL (K. pneumonia), 0.75 - >256 µg/mL(A. baumanii), 1.5 - >256 µg/mL (P. aeruginosa)and 0.75 - 16 µg/mL(E. coli). Four out of seven patients achieved optimal amikacin level.

Conclusion: despite high Cmax, only half of the patients achieved optimal amikacin level with highly variable Cmax. This study suggests that measurement of Cmax and MIC are important to optimize septic patients management.