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.
.....mikasin merupakan salah satu pilihan antibiotik untuk tatalaksana sepsis dan syok septik. Kondisi sepsis dapat mempengaruhi farmakokinetik amikasin yang juga dapat berefek pada farmakodinamiknya. Saat ini belum pernah dilakukan penelitian untuk mengevaluasi kadar puncak (Cmax) amikasin dengan dosis standar pada pasien sepsis dewasa di Indonesia. Tujuan penelitian ini adalah untuk mengetahui ketercapaian kadar amikasin optimal pada pasien sepsis dengan dosis standar.
Metode: semua pasien sepsis di ICU RSCM periode Mei-September 2015 yang mendapat amikasin dosis 1 g/hari IV diikutkan dalam penelitian. Data hasil kultur mikrobiologi dan minimum inhibitory concentration (MIC) didapatkan dari pemeriksaan mikrobiologi. Dilakukan pengukuran Cmax amikasin dan penghitungan Cmax/MIC. Kadar optimal amikasin dinyatakan tercapai bila Cmax/MIC >8.
Hasil: rerata Cmax amikasin adalah 86,4 (kisaran 43,5-238) g/mL, dengan 87% pasien memiliki Cmax >64 g/mL. Data MIC didapatkan dari 7 dari 23 pasien. Bakteri yang banyak ditemukan dari hasil kultur pasien sepsis di ICU RSCM ialah K. pneumonia, A. baumanii, P. aeruginosadan E. coli. Rentang nilai MIC untuk patogen tersebut berturut-turut yaitu 0,75 - >256 g/mL, 0,75 - >256 g/mL, 1,5 - >256 g/mL dan 0,75 - 16) g/mL. Sebanyak 4 dari 7 pasien mencapai kadar amikasin yang optimal.
Kesimpulan: Cmax amikasin yang dicapai dengan dosis 1g/hari sangat bervariasi. Hanya pasien mencapai kadar amikasin optimal meskipun kadar puncak yang dicapai cukup tinggi. Pengukuran kadar puncak dan

MIC bakteri sangat penting dalam mencapai terapi yang optimal