Ertapenem blood concentration: a retrospective cohort study to analyze risk for neurotoxicity.

David Campany-Herrero[1], Alba Pau-Parra[1], Pablo González-Moreno[1], Jaume Vima-Bofarull[1], Danae Anguita-Domingo[1], and Bruno Montoro-Ronsano[1]

[1]Hospital Universitari Vall d'Hebron

October 21, 2022

Abstract

Aim Several cases of ertapenem-related neurotoxicity has been published in the current literature. However, studies evaluating the ertapenem blood concentration as a risk of these adverse events are scarce. We aimed to evaluate the relationship between the ertapenem concentration and the risk of neurological toxicity. Methods Retrospective study, including patients who underwent ertapenem treatment between october 2019 and february 2021. We excluded critical patients and those whose blood sample were not properly took in order to analyze ertapenem trough concentration. We also excluded patients whose clinical follow-up was not properly realized for the entire period of ertapenem treatment. The main outcome was the presence of any suspicious neurological side effect owing to ertapenem administration and its relationship with the plasma concentration. Secondary outcomes were to identify other clinical and analytical data contributing to a higher risk of neurotoxicity. Results Cohort was initially composed by 158 individuals. For the final analysis we evaluated 102 patients, reporting a neurological alteration in 13/102 (12.7%). Mean ertapenem trough plasma concentration was significantly higher in patients showing neurotoxicity in comparison with those who did not (37.8 mcg ml-1 SD±35.7 vs 14.6 mcg ml-1 SD±15.2; p=0.002). In multivariable logistic regression analysis, ertapenem plasma concentration (OR= 1.07; p=0.006), a moderate renal insuficiency (OR= 9.2; p=0.02) and a history of previous neurologic disease (OR=9.9;p=0.02) were identified as risk factors of neurological alteration during ertapenem treatment. Conclusions Identifying properly patients who may accumulate the antibiotic by determining their plasma levels could be helpful to minimize the risk of neurotoxicity.

Hosted file

`Main_document.docx` available at https://authorea.com/users/516564/articles/591374-ertapenem-blood-concentration-a-retrospective-cohort-study-to-analyze-risk-for-neurotoxicity

Hosted file

`figure_1.docx` available at https://authorea.com/users/516564/articles/591374-ertapenem-blood-concentration-a-retrospective-cohort-study-to-analyze-risk-for-neurotoxicity

Hosted file

`Figure_2.docx` available at https://authorea.com/users/516564/articles/591374-ertapenem-blood-concentration-a-retrospective-cohort-study-to-analyze-risk-for-neurotoxicity