Abstract:

Purpose of review: The aim of this review is to discuss the rationale of and current evidence for prolonged beta-lactam infusion in the management of Gram-negative infections.

Recent findings: Pharmacokinetic/pharmacodynamic (PK/PD) data from various in-vitro and in-vivo experimental studies conclusively support prolonged infusion over intermittent infusion in terms of achieving effective beta-lactam exposure for maximal bacterial killing. Superior PK/PD target attainment has been demonstrated with prolonged beta-lactam infusion in patient populations that are more likely to have less susceptible Gram-negative infections. These populations include critically ill patients, cystic fibrosis patients and patients with malignant diseases. The clinical impact of prolonged beta-lactam infusion is likely to be the greatest in these patient groups: critically ill patients with a high level of illness severity who are not receiving renal replacement therapy; patients with nonfermenting Gram-negative bacilli infection and patients with respiratory infection. Critically ill patients with augmented renal clearance may not achieve effective beta-lactam exposure even with the use of prolonged infusion. Maximizing the effectiveness of prolonged beta-lactam infusion via therapeutic drug monitoring is becoming a more common strategy in the management of critically ill patients with Gram-negative infection.

Summary: Prolonged beta-lactam infusion may not benefit all patients but only for those who are critically ill and/or immunocompromised, who are also more likely to have less susceptible Gram-negative infections.

Reference:

Abdul-Aziz MH, Portunato F, Roberts JA. Prolonged infusion of beta-lactam antibiotics for Gram-negative infections: rationale and evidence base. Curr Opin Infect Dis. 2020 Sep 29. doi: 10.1097/QCO.0000000000000681. Epub ahead of print. PMID: 33009140.