The mortality of patients with sepsis and septic shock is still unacceptably high. An effective calculated antibiotic treatment within 1 h of recognition of sepsis is an important target of sepsis treatment" Richter et al (2018).

Abstract:
The mortality of patients with sepsis and septic shock is still unacceptably high. An effective calculated antibiotic treatment within 1 h of recognition of sepsis is an important target of sepsis treatment. Delays lead to an increase in mortality; therefore, structured treatment concepts form a rational foundation, taking relevant diagnostic and treatment steps into consideration. In addition to the assumed infection and individual risks of each patient, local resistance patterns and specific problem pathogens must be taken into account during the selection of anti-infective treatment. Many pathophysiologic alterations influence the pharmacokinetics (PK) of antibiotics during sepsis. The principle of standard dosing should be abandoned and replaced by an individual treatment approach with stronger weighting of the pharmacokinetics/pharmacodynamics (PK/PD) index of the substance groups. Although this is not yet the clinical standard, prolonged (or continuous) infusion of β-lactam antibiotics and therapeutic drug monitoring (TDM) can help to achieve defined PK targets. Prolonged infusion is sufficient without TDM, but for continuous infusion, TDM is generally necessary.

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A further argument for individual PK/PD-oriented antibiotic approaches is the increasing number of infections due to multidrug-resistant (MDR) pathogens in the intensive care unit. For effective treatment, antibiotic stewardship teams (ABS teams) are becoming more established. Interdisciplinary cooperation of the ABS team with infectious disease (ID) specialists, microbiologists, and clinical pharmacists leads not only to rational administration of antibiotics, but also has a positive influence on treatment outcome. The gold standards for pathogen identification are still culture-based detection and microbiologic resistance testing for the various antibiotic groups. Despite the rapid investigation time, novel polymerase chain reaction(PCR)-based procedures for pathogen identification and resistance determination are currently only an adjunct to routine sepsis diagnostics, due to the limited number of studies, high costs, and limited availability. In complicated septic courses with multiple anti-infective therapies or recurrent sepsis, PCR-based procedures can be used in addition to treatment monitoring and diagnostics. Novel antibiotics represent potent alternatives in the treatment of MDR infections. Due to the often defined spectrum of pathogens and the practically (still) absent resistance, they are suitable for targeted

treatment of severe MDR infections (therapy escalation).

Reference:

Richter, D.C., Heininger, A., Brenner, T., Hochreiter, M., Bernhard, M., Briegel, J., Dubler, S., Grabein, B., Hecker, A., Kruger, W.A., Mayer, K., Pletz, M.W., Storzinger, D., Pinder, N., Hoppe-Tichy, T., Weiterer, S., Zimmermann, S., Brinkmann, A., Weigand, M.A. and Lichtenstern, C. (2018) Bacterial sepsis : Diagnostics and calculated antibiotic therapy. Der Anaesthesist. January 30th. .

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