Carbapenems

Carbapenems are highly potent bactericidal beta-lactam antibiotics, which are beta-lactamases resistant.

Antimicrobial spectrum and indications

Carbapenems have an extremely broad spectrum of action. They are effective against both aerobic and anaerobic microorganisms, G + and G−, including *Pseudomonas aeruginosa* and strains of *Streptococcus pneumoniae* highly resistant to penicillins. In general, they have the broadest spectrum of all beta-lactams.

They are used in the treatment of *'life-threatening infections'* and *'nosocomial infections'* caused by multidrug-resistant strains (*Acinetobacter* spp., *Klebsiella spp.*, *Enterobacter spp.* , *Pseudomonas aeruginosa*), severe pneumonia, complicated intra-abdominal infections, and severe skin and soft tissue infections. They are also used in the empirical treatment of febrile neutropenia.

Pharmacokinetics

Carbapenems are administered exclusively parenterally. They penetrate well into tissues and fluids, including the cerebrospinal fluid. They are excreted by the kidneys.

Side effects

They are quite rare and insignificant. The most common are allergic skin symptoms and GIT problems. Having an allergy to carbapenems does not signify an allergy to other beta-lactams. Overgrowth of yeast may occur after therapy.

Carbapenem resistance

Due to its low resistance, carbapenems are among the so-called backup antibiotics (last resort use), the use of which is limited to the most serious cases with the potential occurrence of resistant strains. Nevertheless, carbapenem-resistant bacterial strains appear. The most important mechanism of carbapenem resistance is the production of carbapenemases. Carbapenemases are enzymes produced by gram-negative microorganisms that are able to hydrolyze a carbapenem molecule. The emergence of carbapenem-resistant strains is associated with the use of broad-spectrum antibiotics. These organisms can cause both asymptomatic colonization and a range of infections such as bacteremia, ventilator-associated pneumonia, urinary tract infections, or catheter-associated sepsis. Carbapenemase-producing microorganisms include some strains of K. pneumoniae and E. coli. The treatment of infections caused by these microorganisms is very difficult and must involve a combination of carefully selected broad-spectrum antibiotics.

Examples

imipenem

The combination with cilastatin is used (not an ATB, but prevents imipenem from being converted to inactive metabolites in the kidneys by dehydropeptidase I activity).

meropenem, ertapenem

These have good penetration into body fluids and tissues (lungs, bronchial secretions, bile, cerebrospinal fluids, gynecological tissues, skin, fascia, muscles, and peritoneal exudate). They penetrate into G + and G- bacteria.

References

Related Articles

- Antibiotics
- Beta-lactam antibiotics
- Penicillins
- Monobactams
- Cephalosporins

External links

- Karbapenemy (česká wikipedie)
- Carbapenem (anglická wikipedie)

Source

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