Tigecycline- A New Tetracycline Derivative for MRSA Infection

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ABSTRACT

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Introduction: The inevitable consequence of the widespread use of antimicrobial agents has been the emergence of antibiotic-resistant pathogens, fueling an ever-increasing need for new antimicrobial agents.

Methodology: The clinical use and therapeutic effects of the new drug Tigecycline is described.

Result: Tigecycline is an example of a new drug developed in response to the growing prevalence of antibiotic resistance in bacteria such as Staphylococcus aureus. It was approved by FDA in 2005

Keywords: Tigecycline, Antibiotic resistance, Irrational use of antibiotics, Broad spectrum antibiotic

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Unlike other diseases antimicrobial therapy is aimed at the pathogen. The inevitable consequence of the widespread use of antimicrobial agents has been the emergence of antibiotic-resistant pathogens, fueling an ever-increasing need for new antimicrobial agents (AMA). Tigecycline is an example of a new AMA developed in response to the growing prevalence of antibiotic resistance in bacteria such as Staphylococcus aureus. It was approved by FDA in 2005

Tigecycline is a glycyl cycline structurally related to minocycline (N, N-dimethylglycylamido)-6- demethyl-6-deoxytetracycline.

Mechanism of action

It binds to the 30 S ribosomal unit in the bacterial cell. Consequently the binding of aminoacyl t RNA to the mRNA ribosome complex is interfered with. The peptide chain elongation does not occur and thus inhibits protein synthesis and multiplication. It is a bacteriostatic agent.

Bacterial spectrum

Tigecycline has expanded broad - spectrum antimicrobial activity. It is active against many Gram +ve bacteria, Gram -ve bacteria and anaerobes, including Methicillin resistant Staphylococcus aureus (MRSA) and multi-drug resistant strains of Acinetobacter baumannii. It has no activity against Pseudomonas spp or Proteus spp.

Dose

There is no oral form available at present. It is given by slow intravenous infusion (30 to 60 minutes). A single dose of l 00 mg is given first, followed by 50 mg every twelve hours. It is not licensed for use in children.

Kinetics

71-89 % is protein bound and is not metabolised in the body. Excretion is 59% biliary, 33% renal. Patients with impaired liver function need to be given a lower dose. No adjustment is needed for patients with impaired kidney function.

Indications

Tigecycline is efficacious for the treatment of complicated intra abdominal infections and complicated skin and skin structure infections suppurative wound infections, IJV line infection and bacterial endocarditis caused by MRSA.

Adverse drug reaction (ADR)

Allergic potential is less. Common ADR are diarrhea, nausea and vomiting, dizziness, asthenia, raised SGOT, alkaline phosphatase and LDH. Nausea and vomiting is mild or moderate and usually occurs during the first two days of therapy. Other side effects include pain

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at the injection site, swelling and irritation. Like tetracycline, it shows increased sensitivity to sunlight. It affects bone and teeth and avoid use in children and pregnancy. As with other antibiot1cs, overgrowth of organisms that are not susceptible to tigecycline can occur.

Drug interaction

With co-administered Warfarin, INR is raised.

AMA resistance

Decreased susceptibility to the development of resistance when compared with other tetracycline antibiotics.

END NOTE

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Conflict of Interest: None declared

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