Oxacillin*

Class: β-lactam

Overview

Oxacillin was developed by adding an acyl side chain to the penicillin molecule. The acyl side chain prevents disruption of the β-lactam ring by penicillinase. Thus oxacillin, along with methicillin and nafcillin, is a member of a group of β-lactams referred to as penicillinase resistant penicillins.

The mechanism of action of oxacillin is interference with cell wall synthesis by attachment to penicillin-binding proteins (PBPs), inhibition of cell wall peptidoglycan synthesis and inactivation of inhibitors to autolytic enzymes.

Resistance

Some strains of *Staphylococcus aureus* have developed resistance by exhibiting PBPs with lower affinity for penicillins. This type of resistance is employed by methicillin resistant *Staphylococcus aureus* (MRSA). MRSA microorganisms are uniformly resistant to all of the β-lactamase resistant penicillins, including oxacillin. Coagulase negative staphylococci are predominantly resistant.

Effectiveness

Oxacillin is extremely effective against the β-lactamase producing staphylococci such as methicillin sensitive *Staphylococcus aureus* (MSSA) and *S epidermidis*. Compared with penicillin G, however, oxacillin is generally less potent against other Gram-positive organisms.

See the penicillin section for an explanation of uptake in body fluids and CSF.

***References available by request. Call the Infectious Disease Epidemiology Section, Office of Public Health, Louisiana Department of Health and Hospitals (504-219-4563)**