Indiana Medicaid Therapeutics Committee
Therapeutic Class Review Summary

Therapeutic Class:
Ophthalmic Antibiotics

Overview:
Ophthalmic antibiotic agents are used to treat superficial ocular bacterial and fungal infections. These superficial bacterial infections include conjunctivitis, blepharitis, and corneal ulcers. Acute conjunctivitis is the most common disorder of the eye seen by the primary care physician, and the term encompasses a broad group of conditions presenting as inflammation of the conjunctiva. The most common pathogen of bacterial infections varies with age. In children, that pathogen is *H. influenzae* and *S. pneumoniae*, and the pathogens in adults range from Staphylococcus to Pseudomonas, usually introduced as a contagious manifestation. Most cases, usually about 80%, become bilateral, justifying bilateral treatment even when presenting unilaterally. A typical case of untreated conjunctivitis will usually resolve in about 8 days. With medication, conjunctivitis symptoms are alleviated in approximately 4 days.

Treatment of superficial ocular infections with topical agents is indicated within 4 days of the onset of symptoms. There are several therapeutic options approved for the treatment of superficial ocular infections. The topical agents used to treat ocular infections are grouped into various classes such as aminoglycosides (gentamicin, neomycin, and tobramycin), macrolides (azithromycin, erythromycin), fluoroquinolones (ciprofloxacin, levofloxacin, ofloxacin, gatifloxacin, and moxifloxacin), and others including natamycin (should be reserved for fungal eye infections). Gatifloxacin and moxifloxacin are two newer fluoroquinolones; azithromycin is a new macrolide. Combination products are also available and include various combinations of bacitracin, neomycin sulfate, and/or polymyxin B sulfate, tobramycin and dexamethasone.

Few studies of ophthalmic antibiotics have been done that compare the efficacy of these agents. This may be due to the age of some of these products and the established use by physicians. Resistance is a concern with all antibiotics; however, there have not been any clinical trials to evaluate resistance to ophthalmic antibiotics. The safety profiles of the ophthalmic antibiotics are very different. Neomycin is associated with a significant incidence of contact dermatitis, while gentamicin and tobramycin are associated with ocular toxicities. The fluoroquinolones are broad-spectrum (including coverage for pseudomonas) antibiotics with mild to moderate side effects; however, they are expensive and should be reserved for severe infections.

Generic Name	Trade Name	Dosage Form	Manufacturer	Generic
Azithromyin	Azasite™	Solution	Inspire	N
Bacitracin	AK-Tracin®	Ointment	Akorn	Y
Ciprofloxacin	Ciloxin®	Solution, Ointment	Alcon	Y
Erythromycin	Ilotycin®	Ointment	Various	Y
Gatifloxacin	Zymar®	Solution	Allergan	N
Gentamicin	Garamycin® (BRAND PRODUCT DISCONTINUED)	Ointment, Solution	Various	Y
Levofloxacin	Quixin® (0.5%), Iquix® (1.5%)	Solution	Santen	N N
Moxifloxacin	Vigamox®	Solution	Alcon	N
Natamycin	Natacyn®	Suspension	Alcon	N
Neomycin Sulfate	Neosporin®	Ointment, Solution	Various	Y
Ofloxacin	Ocuflox®	Solution	Allergan	Y
Polymyxin B Sulfate & Bacitracin	Polysporin® (BRAND PRODUCT DISCONTINUED)	Ointment	Various	Y
Tobramycin	Tobrex®	Solution, Ointment	Various	Y

Summary:
Selection of a topical, ophthalmic antibiotic for the preferred drug list should be based on the spectrum of activity, efficacy, and safety. Many of these agents are generically available. A fluoroquinolone agent should be utilized if there is a need to increase the spectrum of coverage for resistant organisms. The two newer fluoroquinolones, gatifloxacin and moxifloxacin, and the new macrolide, azithromycin, have been added to the arsenal of treatment agents for ophthalmic bacterial infections. However, current data do not suggest that the newer agents have any clinical advantage over previously available agents. Selection of an agent for the preferred drug list should be based on spectrum of coverage, safety, and cost.