Ocular Sodium Cromoglycate
An Overview of its Therapeutic Efficacy in Allergic Eye Disease

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Contents

Summary ............................................................................................................. 131
1. Pharmacodynamic Properties ................................................................. 134
2. Pharmacokinetic Studies ........................................................................ 135
3. Therapeutic Trials .................................................................................. 136
   3.1 Classification of Different Allergic Eye Diseases ............................... 136
   3.2 Design of Clinical Trials in Allergic Eye Diseases ......................... 137
   3.3 Trials in Allergic Conjunctivitis ....................................................... 137
      3.3.1 Open Studies ............................................................................. 137
      3.3.2 Controlled Studies ..................................................................... 140
   3.4 Trials in Vernal Keratoconjunctivitis ............................................... 141
   3.5 Giant Papillary Conjunctivitis .......................................................... 144
4. Side Effects .............................................................................................. 145
5. Dosage and Administration ................................................................... 145
6. The Place of Ocular Sodium Cromoglycate in the Treatment of Allergic Eye Disease. 146

Summary

Synopsis: Sodium cromoglycate stabilises mast cell membranes and prevents the release of histamine and other biochemical mediators. When topically applied to the eye before allergen exposure, ocular sodium cromoglycate\(^1\) prevents many of the signs and symptoms associated with type I allergic reactions (which includes hayfever, acute allergic and chronic allergic conjunctivitis, and vernal keratoconjunctivitis) and giant papillary conjunctivitis.

Although difficulties exist in evaluating clinical trials in allergic eye disease, both open and controlled studies have shown ocular sodium cromoglycate to be very effective in re-

\(^1\) ‘Opticrom’, ‘Opticon’ (Fisons Pharmaceuticals).
lieving the subjective symptoms and clinical signs of the above ocular disorders. In addition, ocular sodium cromoglycate may decrease the need for supplementary oral antihistamines and, more importantly, the need for ocular corticosteroids, thus decreasing the incidence of steroid-induced ocular side effects. However, in severe cases and in instances of acute exacerbation of symptoms, the combined ocular application of sodium cromoglycate and corticosteroids may be very effective.

No systemic or severe adverse reactions have been attributed to ocular sodium cromoglycate, which is not surprising since systemic drug absorption from the eye is minimal. However, transient local stinging and burning have been reported.

Thus, although further studies in giant papillary conjunctivitis and comparative studies with corticosteroids in allergic conjunctivitis and vernal keratoconjunctivitis are needed to more clearly define the extent of benefits that may be obtained from ocular sodium cromoglycate, it is clear that the safety and efficacy of the drug in type I allergic eye diseases is such that it should be considered as a first-line agent when drug therapy of these disorders is indicated.

Pharmacodynamic Properties: Since the conjunctiva of the eye contains numerous inflammatory cells responsible for antigen elimination, phagocytosis and immunological memory of the individual, it is susceptible to a number of different types of allergic eye disease. The pharmacological effects of sodium cromoglycate have been ascribed to stabilisation of the mast cell membrane, which prevents the release of histamine and other biochemical mediators after the antigen (or offending allergen) has reacted with antibody at the cell surface. However, once these mediators have been released and symptoms have occurred, sodium cromoglycate is not effective except to prevent a reaction to the next exposure. Sodium cromoglycate has no direct vasoconstrictor, bronchodilator, antihistamine or anti-inflammatory activity.

Pharmacokinetic Studies: Sodium cromoglycate is effective only by topical administration due to its lipid insolubility. Only very low concentrations of sodium cromoglycate are systemically absorbed after ocular administration to man (about 0.03%) or rabbits (up to 0.02%). Sodium cromoglycate has been found to be detectable in aqueous humour of the rabbit eye for up to at least 7 hours but less than 24 hours after topical application. Systemically absorbed drug is excreted unchanged in the bile and urine.

Therapeutic Trials: Of the 4 major types of allergic eye conditions, ocular sodium cromoglycate is effective primarily on those of the IgE-mediated type I (atopic allergy or immediate hypersensitivity reaction) variety. These type I reactions include hay fever conjunctivitis and acute allergic conjunctivitis, which are caused by pollen and non-pollen allergens, respectively. Other type I reactions include chronic allergic conjunctivitis, which is used to describe the perennial form of allergic conjunctivitis, and vernal keratoconjunctivitis (potentially the most severe of the type I reactions). However, giant papillary conjunctivitis, which may be seen in users of contact lenses or associated with other foreign bodies, is unlikely to be mediated directly by IgE although ocular sodium cromoglycate has proven useful.

There are many difficulties in evaluating clinical trials of agents used to treat allergic eye diseases. Trials should be placebo-controlled and performed during the pollen season and be of 'within-patient' design. Since ocular sodium cromoglycate is essentially prophylactic, treatment should also ideally be initiated before any allergic symptoms have appeared. Importantly, since there has been no proven simple and reliable objective method of measuring the severity of symptoms of allergic eye diseases, reliance has been placed on patient subjective assessments of changes in the severity of their symptoms, using patient diary cards.

Open studies in allergic conjunctivitis have suggested ocular sodium cromoglycate 2