

Corticosteroids for hospitalised children with acute asthma

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The World Health Organization has produced guidelines for the management of common illnesses in hospitals with limited resources. This series reviews the scientific evidence behind WHO's recommendations. The WHO guidelines, and more reviews are available at: http://www.who.int/child-adolescent-health/publications/CHILD_HEALTH/PB.htm

This review addresses the question: *When are oral steroids indicated in acute asthma?*

The **WHO Pocketbook of Hospital Care for Children** recommends that if a child has a severe acute attack of wheezing and a history of recurrent wheezing, oral prednisolone should be given, 1mg/kg, usually for 3 days.

(Pocketbook chapter 4.4.2, page 90).

Introduction:

It is estimated that 300 million people worldwide currently suffer from asthma¹. Although prevalence is considerably higher in developed countries, the burden of asthma in developing countries is increasing, particularly in big cities of Africa and Latin America. Asthma is an important cause of hospitalisation in children and the rate of hospitalisation increases with inadequate long term treatment. Prevalence of asthma symptoms in children is already 15-20% in several big cities of Latin America and Africa². Asthma accounts for approximately 250 000 deaths a year worldwide, many of which could be prevented. Many deaths result from poor long-term healthcare and delay in treatment during attacks¹. Corticosteroids have proven useful in the treatment of acute asthma in developed countries but recommendations on dosage and delivery vary considerably.

Methodology

The Cochrane Library was searched and one review was found on this subject. This article reviews studies conducted in developed countries, however looks at the effectiveness of prednisolone in the treatment of acute asthma. It details the selection strategy and the inclusion criteria of the studies. The interventions and outcomes assessed are clearly outlined, and the limits of each RCT described³.

Seven randomised controlled trials were included, observing children between 1-18 years. Three of these looked specifically at the effect of oral prednisolone, at three different single doses. Nebulised bronchodilators (usually salbutamol 0.15mg/kg or 5mg dose) were used as a co-intervention in each study.

Results

Two studies, looking at a total of 210 children, reported a significant difference between length of stay in prednisolone treated groups and control groups; treatment groups were more likely to be discharged at first re-examination (under 4 hours after admission) (OR=3.83; 95% CI 1.28-11.44, OR=15.11; 95% CI:3.37-67.67). The pooled results of these studies (OR=7.00; 95% CI:2.98-16.45) show significant favour towards treatment.

Two studies found that there were no re-referrals with acute asthma in the two weeks following the treatment. The third found no exacerbations in either group within one week. The NNT (number needed to treat) for this outcome when all studies were combined showed that treating three children with systemic steroids prevents one relapse within 1-3 months.

Comparison of prednisolone with a nebulised steroid reported that although the severity of

shortness of breath decreased to a greater extent with nebulised steroids, pulmonary function testing seemed to favour prednisolone; there was no significant difference between the two drugs. None of the studies looked specifically at side effects; however all suggested that short courses were safe when treating acute exacerbations of asthma. Formal evaluations of safety were not made.

Prednisolone takes effect within 1-4 hours, and its half-life is 12-30 hours. Subsequently effects may be seen initially, and then gradually decrease. Additionally pulmonary function testing is difficult in young children. There is generally insufficient research on nebulised steroids, and none of the studies included those requiring intensive care or in status asthmaticus, which may be applicable in the developing world. Additionally no studies included patients already taking steroids for treatment of chronic asthma, so findings may not apply to these patients.

This review concluded that there is little difference between corticosteroids as they all have approximately similar benefits, including early discharge and improving symptom scores. Emergency treatment of an acute asthma exacerbation with prednisolone seems to result in earlier recovery of illness.

Summary

- Use of systemic corticosteroids such as oral prednisolone results in earlier discharge (in the first 4-6 hours). It does not appear to reduce length of stay if admitted to hospital.
- Relapses are less common 1-3 months after discharge if acute asthma is treated with systemic corticosteroids.
- Although not formally tested, corticosteroids seem to be safe and well tolerated.
- Systemic corticosteroids decrease the duration of illness.

References

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