



EVALUATION OF THE EFFICACY OF ORAL PREDNISOLONE IN FIRST EPISODIC WHEEZE IN 6MONTHS - 24 MONTHS OLD CHILDREN: A RANDOMISED CONTROL TRIAL.

**Dr Subhash
Chander**

MD, Pediatrician, Civil hospital, Jwalamukhi, Kangra Himachal Pradesh

**Dr Avishek
Dhiman***

MS ENT, Civil hospital, Jwalamukhi, Kangra Himachal Pradesh
*Corresponding Author

ABSTRACT

Acute viral wheeze is one of the most common medical emergency situations in infancy and physicians caring for acutely ill children will regularly be faced with this condition. The role of systemic corticosteroids in the treatment of children with acute wheezing remains a controversial subject. We studied the effect of oral prednisolone vs placebo in first episodic wheeze children aged 6months to 24 months for the duration of hospital stay and recurrent hospitalisation within 2 months of discharge from hospital.

KEYWORDS : Prednisolone, viral wheeze, bronchiolitis

INTRODUCTION

Acute wheezing affects one third of young children¹. Acute expiratory wheezing illnesses (bronchiolitis, acute asthma) are the primary causes of hospitalization in children. American Academy of Pediatrics (AAP) together with the European Respiratory Society (ERS) underlined that bronchiolitis is a clinical diagnosis, recognized as "a constellation of clinical symptoms and signs including a viral upper respiratory prodrome followed by increased respiratory effort and wheezing in children less than 2 years of age" An estimated 3% of children without other medical conditions are hospitalized for bronchiolitis². Fifty percent of these children continue to wheeze, at least recurrently, until school age. The risk factors for recurrent wheezing include host, environment, and genetic factors such as male sex, eczema, atopy, rhinitis apart from colds, older siblings, maternal smoking, maternal asthma^{1,3}. Acute wheezing is predominantly related to viral respiratory Infection and RSV contributing most of the times.^{3,6} The other viral aetiologies associated with recurrent wheezing are not well known due to lack of viral diagnostic tool availability. Rhinovirus is particularly interesting, because it is the second most common virus, triggering early wheezing in as many as 45% of cases.^{4,6} It would be of utmost importance to identify children at high risk for recurrent wheezing and provide them with effective intervention. However systemic corticosteroids are effective in the management of asthma exacerbations in children⁷, many efficacy studies of early wheezing have been discouraging. First episodes of RSV-induced wheezing in infants do not respond to systemic corticosteroids at standard doses.^{8,11}

METHODS

Children aged from 6 months to 24 months, admitted In Civil hospital Jwalamukhi district Kangra, for acute wheezing for the first time, were considered for the study. We report here the efficacy of prednisolone in the treatment of first viral wheezing in children aged 6months to 24months. Excluded were children with previous wheezing attack, inhaled corticosteroids, systemic corticosteroid treatment in the preceding 4 weeks, chronic disease (other than asthma or allergy), severe wheezing necessitating intensive care unit treatment or previous participation in this study.

Study Design

The need for hospitalization was decided independently of the study by an on-duty physician in the emergency room. In the ward, the eligible children were randomly assigned in a double-blind fashion to receive either oral prednisolone (first dose 2 mg/kg, then 2 mg/kg/d in two divided dosages. 5-mg Prednisolone tablets or placebo after informed consent from guardians. The children were randomized using computer

generated methods. The tablets and packages were indistinguishable in appearance from those of the active drug and provided in numbered containers. The study drugs were administered by nurses independent of the study. The tablets were minced and administered with water or yogurt.

All patients received nebulized levosalbutamol at 2-hour intervals for the first 12 hours and then at 4-hour intervals while in the hospital. After Discharge, beta2-agonists were used on demand. Oxygen inhalation and i.v. fluids were given according to necessity. The study physicians examined the patients on study entry and twice daily thereafter at 8–10 AM and 8–10 PM during their hospital stay and scored the respiratory symptoms. Each patient was scored throughout the study by the same investigator. The guardian filled in a questionnaire on patient characteristics. After the child's discharge, the guardian recorded the child's symptoms in a diary for 2 weeks, which was followed by a follow-up visit. After 2 months, the parents were contacted by phone to record any relapses necessitating a visit to a physician or hospitalization.

Outcome Measures

The primary end point was the time until ready for discharge, which was defined as a duration of respiratory symptoms score ≤ 1 during the hospital stay. The respiratory symptoms score, which was assessed every 12 hours during hospitalization, is a summed score for the degree of dyspnea (0 _ none, 1 _ mild, 2 _ moderate, 3 _ severe), type of breathing (0 _ normal, 1 _ use of stomach muscles, 2 _ use of intercostal muscles, 3 _ nasal flaring), severity of auscultatory findings on wheezing (0 _ none, 1 _ expiratory, 2 _ inspiratory and expiratory, 3 _ audible without stethoscope). An estimation of 6 hours was used for the last 12-hour period between hospital assessments i e, the period during which the patient became ready for discharge. The readmission to the outpatient Clinic or hospital for recurrent wheezing during a 2-month period after discharge was also enquired telephonically.

Statistical analysis

Data were presented as frequency, percentage, mean, and standard deviation. Quantitative and qualitative variables were compared using Student t-test and Chi square test. P value less than 0.05 was considered significant. Statistical analysis was performed using SPSS v21.0.

RESULTS

During the study 80 patients have been enrolled 40 in each of two groups study group which used prednisolone 2 mg/kg/day in two divided doses and other placebo group which received placebo rest of the treatment protocol was same in both of groups.

Average age in the study group was 13.3 months and in placebo group 14 months (Figure 1) (P=0.597). 47.5% children in study group and 52.5% in placebo group were males (Figure 2).

Mean time to discharge in study group was significantly lower in comparison to placebo group (4.35±1.00 vs. 5.52±1.26; P<0.0001).

We observed the respiratory system score at start of treatment then 12 hourly till score become less than or equal to 1 which was of discharge point for the both of groups. 17.5% patients in study group who were given prednisolone have hospitalisation due to recurrent wheeze within 2 months of discharge which was less than that of placebo group which reported hospitalisation due to recurrent wheeze within 2 months of discharge in 27.5% cases (P=0.189) (Figure 3).

DISCUSSION

Results in this study showed that systemic corticosteroids i.e. Prednisolone in this study may be effective in accelerating the clinical recovery of children admitted with first episodic wheeze. Patients who were treated with prednisolone showed a significant faster clinical improvement, reduced hospital stay and reduced recurrent wheeze episodes within 2 months of discharge. A randomised placebo-controlled clinical trial study done by Csonka et al. demonstrated that children 6 to 35 months Old with virally induced respiratory distress benefited from a 3-day course of oral prednisolone treatment. The proportion of children requiring more than 3 days of hospitalization was 47.5% in the prednisolone group and 67.7% in the placebo group (P = 0.023). There was less need for additional asthma medication (18.0% vs. 37.1%, P = .018) in the prednisolone group and were more likely to be discharged earlier.¹² A study done by Schuh et al. found a significant clinical benefit 4 hours after a single dose of oral dexamethasone (1 mg/kg) administered in the emergency department for children age 2 to 23 months with moderate to severe bronchiolitis.¹³ This finding may be explained by the relatively large dose of dexamethasone used and by its fourfold to six-fold greater potency compared with prednisolone. Acute bronchiolitis is an acute inflammatory condition of the respiratory tract. It would appear to be a condition that should get modified by steroid therapy. According to published material by Committee on drugs for American Academy of Pediatrics concluded in 1970 "there is no scientific basis for routine administration of Corticosteroids in bronchiolitis. An article published in 1997 reviewed the studies on role of Corticosteroids in bronchiolitis.¹⁴ Before AAP statement was made, there was only one double blind control¹⁵ which showed significant reduction in time of oxygen therapy (25 vs 40 hr.) and more rapid discharge (4.4 vs 7.0 days). Subsequent trials however failed to show that systemic steroids had any effect on natural history of bronchiolitis.¹⁶⁻¹⁹

CONCLUSION:

The use of Prednisolone reduced the hospital stay as well as relapses during a 2-month period after first episodes of wheezing.

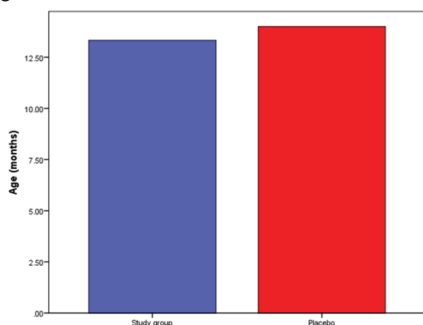


Figure 1: Comparison of age (months)

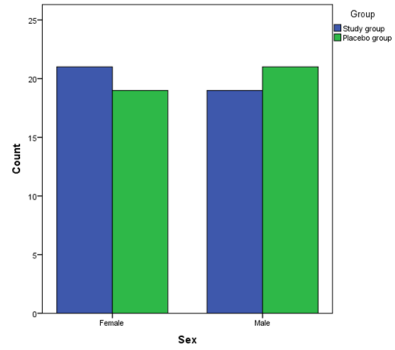


Figure 2: Sex based distribution

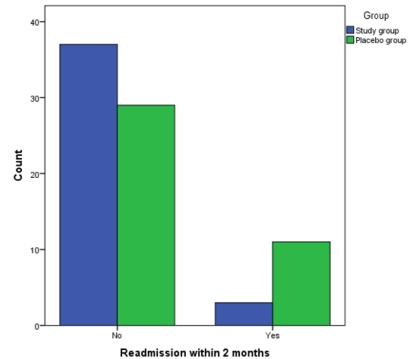


Figure 3: Readmission within 2 months

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