LETTER TO THE EDITOR
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Comparative Efficacy of Dexamethasone versus Hydrocortisone in Severe Acute Pediatric Asthma

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ABSTRACT

This study aimed to compare the efficacy of dexamethasone and hydrocortisone in the treatment of acute paediatric asthma. Forty seven asthmatic children were randomised to receive either dexamethasone (0.6 mg/ml, maximum 16 mg) in a single dose or hydrocortisone (8-10 mg/kg/day) in 4 equal doses for 2 days. Our findings showed that the mean length of hospitalization in children receiving dexamethasone was significantly shorter than those receiving hydrocortisone.

Key words: Asthma; dexamethasone; Hydrocortisone

LETTER

Corticosteroids are effective for treating asthma exacerbations but their efficacies are reported to be varied in different studies because of their different anti-inflammatory potencies.[1-3] Glucocorticoids, hydrocortisone, prednisone, and methylprednisolone are commonly used for treatment of acute asthma. The efficacy of these corticoids in comparison to corticosteroid for treatment of severe acute asthma is controversial.[4,5] Moreover there are reports indicating that glucocorticoids may cause allergic reactions, even anaphylaxis.

The most commonly reported corticosteroids causing anaphylaxis like reactions are hydrocortisone, prednisone, and methylprednisolone.[6]

This study was designed to compare the efficacy of dexamethasone and hydrocortisone in the treatment of severe acute paediatric asthma.

This is a double blind clinical trial where 47 children, aged 2 to 120 months (mean 32.7) took part. These patients were diagnosed as cases of mild-moderate exacerbation of hospital during March 2004 to September 2005.

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Patients were randomised to receive either dexamethasone (0.6 mg/ml, maximum 16 mg) intravenous in a single dose or hydrocortisone (8-10 mg/kg/day) intravenous in 4 equal doses for 2 days. Patients were discharged if they had relief of symptoms, no sign of wheezing or difficulty in breathing, and no or rare episode of coughing. Both groups had been taking B2 antagonist for their asthmatic condition.

The two groups of children were similar in age, sex distribution and severity of illness (Table 1). Statistical analysis showed no significant difference in age ($p<0.05$, 95%CI: -19.43, 15.44) and sex ($p<0.05$).

Results of this study showed that the mean length of hospitalization in the children receiving dexamethasone (3.16 days, SD 2.378) was significantly shorter than the children receiving hydrocortisone (4.68 days, SD 1.375). Statistical analysis, using independent samples T test showed that the difference was significant ($P<0.05$, 95% CI: 2.7, 0.35). Noticeable improvement and rapid response to treatment, with respect to decrease in coughing and wheezing as well as decrease in shortening of breath which resulted to short course of hospitalization, were achieved in dexamethasone group.

It has been shown that using steroids to treat acute exacerbation of asthma will decrease the need for visiting emergency department and hospitalisation, shortening the duration of symptoms and reducing recidivism.

Dexamethasone, methylprednisolone, prednisolone and prednisone have all been used to treat acute exacerbations of asthma, although prednisolone and prednisone are more commonly used. In a study Qureshi et al., showed that two doses of dexamethasone, one given on the first day and the second given the next day, were as effective as 5 doses of prednisolone given first on the admission day and then once daily for 4 days.[7] There were no significant differences in hospital admission rates, relapse rates after discharge from the admission day, or symptom persistence.

Scarfone et al, showed that nebulized dexamethasone was similar to oral prednisone in asthma treatment. The dexamethasone group showed a more rapid response to treatment.[8]

Two doses of dexamethasone over 24 hours have been as effective as 6 doses of prednisone over 5 days in the study by Qureshi et al., although the longer half life of dexamethasone might produce a greater effect on adrenal and immune functions.

Results of our study showed that dexamethasone was more effective than hydrocortisone in the treatment of acute paediatric asthma. Considering the recent report regarding the allergic reaction of hydrocortisone which might worsen the symptoms of asthmatic patients, dexamethasone is a suitable alternative for treatment of acute asthma. Moreover, in our study, group receiving dexamethasone spent shorter time in hospital in comparison to group receiving hydrocortisone. This is a very important issue where scarcity of beds is a concern in the hospital and where the cost of hospitalization is high and the economical status of people is low.

Considering the results of this study and the above mentioned points, hydrocortisone might be replaced by dexamethasone for treatment of severe paediatric asthma. However, further studies are needed to confirm these findings.

Table 1. Characteristics of the studied groups.

Topics	Dexamethasone group	Hydrocortisone group	P value
Mean age (months)*	31.96	33.95	0.819
Sex	17 male,8 female	14 male, 8 female	0.412
Temperature on admission day	37.2	36.9	0.517
Temperature on discharge day	36.9	36.9	0.642
Respiratory rate on admission day	43.1	42.1	0.336
Respiratory rate on discharge day	26.3	25.8	0.128
Length of hospitalization (day)**	3.16	4.68	0.013

*95% Confidence Interval (CI): -19.43, 15.44 **95% CI: 2.7, 0.35

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