



Review Article

Systematic review and meta-analysis of randomized controlled trials on the role of mometasone in adenoid hypertrophy in children



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ABSTRACT

Objectives: Mometasone has been reported to improve the symptoms of nasal obstruction in children with adenoidal hypertrophy. This systematic review and meta-analysis were conducted to evaluate the role of mometasone on different nasal symptoms, otitis media with effusion, adenoid size, and quality of life in children with adenoidal hypertrophy.

Methods: A comprehensive search of MEDLINE, EMBASE, CINAHL and COCHRANE Collaboration databases was undertaken. We identified all the randomized controlled trials (RCTs) in children with adenoidal hypertrophy that compared the effects of mometasone nasal spray and normal saline nasal spray on different outcomes. The deadline of the search was April 2015. The search was supplemented by hand searching of cross-references in the studies and reviews and by contacting the authors of various studies. Only English language RCTs were considered for the systematic review. The primary outcomes were improvement in symptoms of nasal obstruction, mouth breathing, rhinorrhea, snoring, cough, and total nasal symptoms. The secondary outcomes were improvement in otitis media with effusion, quality of life, and size of adenoid. Quality assessment of RCTs was performed using SIGN 50 and Cochrane risk of bias tools. Risk ratio (RR), weighted mean differences (WMD) and their 95% confidence intervals (CI) were calculated for dichotomous and continuous data, respectively. Random effects model was used for the analyses. Heterogeneity was measured by using the I^2 statistics and p value <0.05.

Results: Our search generated 87 citations, of which eight RCTs met the inclusion criteria. The methodological quality of all the RCTs was poor. There was no significant difference between mometasone and control groups for the patient's characteristic and grades of different nasal symptoms, otitis media with effusion, obstructive sleep apnea, and quality of life at the basal level. There was also no significant difference in the number of patients with different symptoms at the basal level. After the administration of mometasone, there were significant improvements in grades of nasal obstruction, 0.8 ± 0.5 versus 2.0 ± 0.6 , WMD -1.16 [$-2.09, -0.23$], snoring 0.3 ± 0.4 versus 1.6 ± 0.6 , WMD -1.07 [$-2.09, -0.05$], total nasal symptoms 2.9 ± 1.3 versus 6.9 ± 1.5 , WMD -4.09 [$-6.64, -1.53$], obstructive sleep apnea, 0.6 ± 0.3 versus 1.4 ± 0.4 , WMD -0.95 [$-1.74, -0.16$], as well as the percentage of patients with nasal obstruction, snoring, obstructive sleep apnea, compared to control. There was tendency of improvement in rhinorrhea, and cough with mometasone.

Compared to control, mometasone nasal spray significantly improved adenoid size or adenoid/choana ratio 50.9 ± 8.8 versus 74.2 ± 12.6 , WMD -21.2 [$-34.0, -8.4$], change in adenoid/choana obstruction from the basal level ($p = 0.01$), and percentage of patients with adenoid hypertrophy, 26% versus 92%, RR 0.29 [0.18, 0.48]. There was improvement in otitis media with effusion, 40% versus 72%, pure tone audiometry 5.2 ± 11 versus 11.6 ± 11 dB, WMD -6.40 dB [$-12.65, -0.15$], and quality of life with mometasone. Subgroup analyses showed that RCTs that followed blinding showed significantly less response compared to RCTs that did not follow it for most of the outcomes.

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Conclusions: Mometasone caused improvements in outcomes of nasal obstruction, snoring, total nasal symptoms, pure tone audiometry, otitis media with effusion, adenoid size, and quality of life. The data is based on meta-analysis of RCTs of poor methodological quality. A high methodological quality, placebo controlled RCT of different doses and duration of administration of mometasone is required to evaluate its clear efficacy and safety in children with adenoid hypertrophy.

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1. Introduction

The adenoids are pyramid-shaped aggregation of lymphoid tissue located in the upper and posterior wall of the nasopharynx. They are present since birth and their hypertrophy is a common problem in childhood. Obstructive adenoids may cause nasal obstruction, mouth breathing, snoring, rhinorrhea, postnasal drip, cough, dry mouth, halitosis, swallowing difficulty, hyponasal voice, restlessness sleep, enuresis, and morning headache. In severe cases, they may induce obstructive sleep apnea, otitis media with effusion, and craniofacial growth abnormality [1–3]. Traditionally, adenoidal hypertrophy and its related symptoms are treated by adenoidectomy [4], though various conservative treatments to its management are under investigation. Recently, the potential role of corticosteroids, especially the topical nasal spray without any systematic side effects has been reported in adenoidal hypertrophy [5,6]. Two systematic reviews reported some improvement in nasal obstruction with intranasal steroids in children with adenoidal hypertrophy [3,7]. They included about seven studies of steroids, such as beclomethasone (three studies), flunisolide (one study), mometasone (two studies), and fluticasone (one study) and did not perform any meta-analysis.

Mometasone is a potent 17-heterocyclic corticosteroid and on intranasal administration, it has a higher binding to corticosteroid receptors, poor systematic concentration (0.1%), and extensive first pass metabolism. It does not suppress the hypothalamo-pituitary axis in the usual doses that are used for intranasal administration

[6,8]. Other authors [10–13] and we [1,9] found some beneficial effect of mometasone nasal spray on some outcomes of nasal obstruction induced after adenoidal hypertrophy. However, there has been no systematic review on the role of mometasone in children with adenoidal hypertrophy, though one to two studies of this topic have been explained in the previous systematic reviews of intranasal steroids [3,7].

The objective of this systematic review and meta-analysis of randomized controlled trials (RCTs) was to evaluate the role of mometasone on symptoms of nasal obstruction, adenoid size, otitis media with effusion, and quality of life in children with adenoidal hypertrophy.

2. Materials and methods

A comprehensive search of MEDLINE, EMBASE, CINAHL and COCHRANE collaboration databases was performed. There was no restriction of publication year and the deadline of search was April 2015. Only English language articles were searched. We used the search strategy of RCTs comparing the effect of mometasone nasal spray with normal saline nasal spray or control in children with adenoidal hypertrophy on different outcomes. The search term included, adenoid or adenoids; hypertrophy, enlarged, overgrow, or swollen; and mometasone or mometasone furate. For Medline, the search was expanded to look for all fields and MeSH Terms. The search was supplemented by search of grey literature from Google, hand search of cross-references of selected articles and review

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