

Steroids as adjuvant treatment of sore throat in acute bacterial pharyngitis

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Abstract

Question I see many children suffering from sore throat and acute pharyngitis. Some adult studies describe faster pain relief when sore throat is treated with steroids. Would a single dose of a steroid, as an anti-inflammatory agent, provide accelerated pain relief for sore throat in children?

Answer A single dose of oral dexamethasone (0.6 mg/kg, maximum 10 mg) leads to significantly ($P < .05$) faster onset of pain relief and shorter suffering, especially in children with severe or exudative group A β -hemolytic streptococcus-positive acute pharyngitis.

Les stéroïdes comme adjuvants thérapeutiques pour le mal de gorge dû à la pharyngite bactérienne aiguë

Résumé

Question Je vois beaucoup d'enfants qui souffrent de maux de gorge et de pharyngite aiguë. Certaines études chez l'adulte décrivent un soulagement plus rapide de la douleur lorsque le mal de gorge est traité avec des stéroïdes. Une dose unique de stéroïdes comme agent anti-inflammatoire procurerait-elle un soulagement accéléré de la douleur chez l'enfant souffrant de mal de gorge?

Réponse Une seule dose de dexaméthasone (0,6 mg/kg, maximum de 10 mg) par voie orale accélère considérablement ($P < ,05$) le soulagement de la douleur et en raccourcit la durée, surtout chez les enfants souffrant de pharyngite aiguë grave ou exsudative due au streptocoque β -hémolytique du groupe A.

Acute pharyngitis is one of the most frequent indications for medical attention, accounting for 1% to 2% of all outpatient visits in the United States. Group A β -hemolytic streptococcus (GABHS) accounts for approximately 25% of acute pharyngitis infections in children, causing inflammation of the pharynx and surrounding lymphatic tissue. Streptococcal pharyngitis is primarily a disease of school-aged children, with a peak incidence between 5 and 15 years of age. The illness results in at least 2 missed days of school and possible dehydration due to odynophagia or dysphagia.¹⁻⁵

Current treatment recommendations for acute pharyngitis vary. While antibiotics such as penicillin are commonly prescribed in cases of bacterial origin, they have been shown to reduce the duration of illness by only 1 day. They are recommended to prevent complications such as peritonsillar abscess, mastoiditis, and rheumatic fever.⁶ Over-the-counter analgesic drugs and gargling or drinking warm liquids are common supportive treatments to manage pain.

Corticosteroids are used effectively as anti-inflammatory agents in asthma, bronchiolitis, and croup, and have also been shown to be effective in

patients with upper respiratory tract infections, acute sinusitis, and infectious mononucleosis, leading to reduction of inflammation-induced pain.^{7,8} Whether steroids can serve as treatment of pain related to pharyngeal inflammation is a question clinicians have asked for more than half a century.⁹ Several prospective trials, mostly in adults, explored the effectiveness of steroids as adjuvant therapy for acute pharyngitis.

Six randomized controlled trials (N=661) have been conducted in outpatient settings, 3 with children (n=393; mean age 8 to 11 years)¹⁰⁻¹² and 3 including children and adults (n=268; mean age 26 to 30 years).¹³⁻¹⁵ Oral^{10-12,15} or intramuscular¹³ dexamethasone (0.6 mg/kg, maximum 10 mg) was given as a single dose or over 3 consecutive days, sometimes with supportive analgesics such as acetaminophen or ibuprofen. One group was given a single dose of beta-methasone (8 mg intramuscularly).¹⁴ Based on a positive rapid streptococcal antigen test result, patients received additional penicillin or erythromycin. Throat swab cultures positive for streptococci were reported for 30% to 60% of patients in most studies.

Primary outcomes were defined mostly as time to onset of symptom reduction and time to complete

pain relief. To quantify severity of symptoms, the patients were asked to grade their pain on a visual analogue scale at the start of treatment and at different points during follow-up, usually once a day until day 2 to 5 after treatment.

Preliminary findings in adults

In a study from Florida, 58 patients 12 years of age and older with exudative acute pharyngitis who were taking antibiotics (penicillin or erythromycin) received a single intramuscular injection of either 10 mg of dexamethasone or saline placebo. Their mean baseline pain score reached 2.5 (scale 0.0 to 3.0). After 24 hours, the pain improved to an average of 0.8 (SD 0.8) in the 26 patients from the dexamethasone group and 1.3 (SD 0.9) in the 25 patients from the placebo group ($P < .05$). Time to onset of pain relief was also faster in steroid-treated patients, who demonstrated relief beginning at 6.3 (SD 5.3) hours, compared with 12.4 (SD 8.5) hours in the placebo group ($P < .01$).¹⁵ Marvez-Valls et al found similar results with intramuscular betamethasone. Significantly better pain scores at follow-up ($P = .0005$) and significantly fewer hours to pain relief ($P = .004$) were documented compared with placebo. In adults with GABHS-positive cultures, there was also a significant reduction in pain scores at follow-up ($P = .02$ to $.006$).¹⁴

In a group of Minnesota patients older than 15 years of age, oral or intramuscular dexamethasone resulted in a similarly quicker onset of pain relief, approximately 4 hours earlier than for those receiving placebo ($P = .029$). Intramuscular administration was slightly but not significantly better than the oral route, but was accompanied by higher drug costs and a more time-consuming administration (oral, \$0.12 [US]; intramuscular, \$0.17 [US]).¹⁵ Statistically significant differences in GABHS-positive patients in terms of onset of pain relief between the oral (8.0 [SD 6.1] hours) and intramuscular (5.3 [SD 6.1] hours) dexamethasone and placebo (15.0 [SD 9.6] hours) arms were confirmed.¹⁵

A recent meta-analysis, including 8 trials in adults, concluded that a combination of corticosteroids and antibiotics shortens the time to onset of pain relief by 6 hours on average, compared with no steroids, even without considering confirmed streptococcal infection.⁸

Effectiveness in children

Three randomized controlled trials in children over the past decade reported considerable differences in pain relief for children with streptococcal infection. Results of rapid streptococcal antigen tests were used to categorize patients into GABHS-positive and GABHS-negative subgroups.¹⁰⁻¹²

Group A β -hemolytic streptococcus-positive subgroup. In 2003, a group from Winnipeg recruited 157 children, of whom 46% were GABHS-positive and 37% had exudative tonsils. Using oral dexamethasone (0.6 mg/kg, maximum 10 mg), pain relief was noted after 6 hours, which was 5.5 hours earlier than in the placebo group ($P < .02$). However, the oral dexamethasone showed no significant effect on complete pain relief ($P = .86$).¹⁰ Similar findings were described by Olympia et al.¹¹

Among 125 children 5 to 18 years old, patients who received dexamethasone had earlier onset of pain relief (9.2 vs 18.2 hours, $P < .001$), fewer hours to complete resolution of sore throat (30.3 vs 43.8 hours, $P = .04$), and larger decline in the McGrath Facial Affective Scale score over the first 24 hours (-0.58 vs -0.43 , $P = .002$).¹¹ Use of different analgesic measures might explain at least some of the differences between these 2 studies.

A group from Ohio conducted a randomized, 3-arm, placebo-controlled trial ($N = 90$) comparing the effectiveness of 1 dose versus 3 daily doses of oral dexamethasone (0.6 mg/kg, maximum 10 mg) in GABHS-positive pharyngitis.¹² Significant improvement in general condition (hazard ratio 1.87, $P = .001$) and return to activity (hazard ratio 2.25, $P < .001$), but not in sore throat symptoms (hazard ratio 1.72, $P = .03$), was found with a single dose of oral dexamethasone. In contrast, 3 daily doses (0.6 mg/kg each) were highly beneficial in relieving sore throat (hazard ratio 2.12, $P = .05$) as well as in improvement of general condition (hazard ratio 1.72, $P = .05$) and promoting return to normal activity (hazard ratio 2.26, $P < .001$). There was no significant difference in the number of days of missed work or school ($P = .68$), but subgroups in this study were small.

Group A β -hemolytic streptococcus-negative subgroup. In children without streptococcal detection, diverse results were found after giving adjuvant oral dexamethasone (0.6 mg/kg, maximum 10 mg). This subgroup, in contrast to the GABHS-positive subgroup, did not receive any antibiotics. Among GABHS-negative children, and hence, among children not treated with antibiotics, no significant difference was found in time to onset of pain relief ($P = .32$) or complete pain resolution ($P = .61$).¹⁰ However, in children with severe symptoms, Olympia et al found a distinct decrease in time to onset of pain relief (8.7 [SD 8.9] hours vs 24 [SD 22.8] hours in the placebo group) and in time to complete pain relief (37.9 [SD 31.4] hours vs 70.8 [SD 49.6] hours in the placebo group).¹¹

Steroid safety profile

Parents and health care providers are at times reluctant to give steroids owing to their potential long-term side

effects.¹⁶ However, no corticosteroid-induced long-term side effects were observed when steroids were used for acute pharyngitis. Only 1 case of hiccups was reported, and that resolved spontaneously after 12 hours.¹⁵

No current recommendation exists for the use of steroids in acute pharyngitis. However, studies in adults and children show that corticosteroids in combination with antibiotic treatment provide symptomatic relief of pain and faster recovery, mainly in patients with severe or exudative sore throat caused by GABHS. For children with severe symptoms and bacterial pathogens confirmed by rapid streptococcal tests, a single dose of oral dexamethasone can be considered a safe adjunctive treatment with antibiotics.^{11,12} Further studies must consolidate previous results in children to determine the role of corticosteroids with antibiotic treatment. 🌸

Competing interests

None declared

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