Corticosteroids for pain relief in sore throat: systematic review and meta-analysis


CRD summary
This review concluded that corticosteroids provided symptomatic pain relief alongside antibiotics. This was a generally well-conducted review and the authors' conclusions appeared to reflect the evidence. However, limitations with the included studies and the issues surrounding the generalisability of the results should be taken into account when interpreting the conclusions.

Authors' objectives
To assess the effects of systemic corticosteroids on pain relief in adults and children with sore throat.

Searching
MEDLINE, EMBASE, The Cochrane Library, DARE and NHS EED were searched from inception to August 2008. Search terms were reported. Citation searches of relevant papers were also undertaken.

Study selection
Randomised controlled trials (RCTs) that compared the effects of systemic corticosteroid versus placebo in adults and children in outpatient (ambulatory) settings were eligible for inclusion, as were studies of patients with clinical signs of acute tonsillitis or pharyngitis and patients with clinical symptoms of sore throat. Studies of patients with infectious mononucleosis, sore throat following tonsillectomy or intubation and peritonsillar abscesses were excluded. The primary outcomes of interest were the proportion of participants with improvement or complete resolution of symptoms, mean times to onset of pain relief and complete resolution of pain.

Included studies were conducted in emergency departments or general practices. Patient ages ranged between four and 65 years; approximately half the population was children. The severity of sore throat was measured by testing for exudate and group A β-haemolytic streptococcus. Most studies administered only one dose of corticosteroids (mostly dexamethasone). All studies administered antibiotics. Analgesics were permitted.

Two reviewers independently screened studies for inclusion. Disagreements were resolved through discussion with a third reviewer.

Assessment of study quality
Two reviewers independently assessed the quality of each study, including items on: allocation concealment; randomisation; comparability of groups at baseline; blinding; treatment adherence; and percentage participation. Disagreements were resolved through discussion with a third reviewer.

Data extraction
Two reviewers independently extracted dichotomous outcome data (number of events) to calculate relative risks and their 95% confidence intervals (CIs). Means and standard deviations were extracted for continuous outcomes, ultimately to calculate mean differences with their 95% CIs. Disagreements were resolved through discussion with a third reviewer.

Methods of synthesis
Where there was no evidence of statistical heterogeneity, a fixed-effect model was used to combine relative risks and weighted mean differences. Where sufficient primary outcome data were reported, the number needed to treat was calculated. When statistical heterogeneity was detected, a random-effects model was used. Statistical heterogeneity was assessed using the I² test.

Sensitivity analyses were undertaken, excluding each study in turn to assess the robustness of the findings. Subgroup analyses using meta-regression were also carried out by age (adults or children), route of corticosteroid, presence of positive bacterial culture or direct antigen test and severity of sore throat.
Results of the review
Eight RCTs (n=743) were included in the review. Sample sizes ranged from 51 to 184 participants. The quality of the included studies was reported to be high. All trials were double-blinded and all had adequate allocation concealment and baseline comparability.

Corticosteroids were significantly more effective than placebo in resolving pain completely at 24 hours (relative risk 3.16, 95% CI 1.97 to 5.08, p<0.001; four RCTs) and 48 hours (relative risk 1.65, 95% CI 1.32 to 2.06, p<0.001; three RCTs). There was no evidence of statistical heterogeneity. The number needed to treat was 3.7 at 24 hours and 3.3 at 48 hours. Subgroup analyses indicated significant effects in adult patients only at 24 and 48 hours (both p<0.001) and significant effects for oral administration of corticosteroids at 24 hours (p<0.001) and 48 hours (p=0.004).

The mean time to onset of pain relief occurred on average 6.3 hours earlier in patients treated with corticosteroids compared to controls (95% CI 9.29 to 3.35, p<0.001; six RCTs). There was evidence of significant statistical heterogeneity (I²=73%). Sensitivity analyses did not significantly alter the findings. Subgroup analyses indicated a significant reduction in mean time to onset of pain relief in patients with exudative sore throat (weighted mean difference 5.5 hours, 95% CI 8.0 to 3.0; two RCTs), sore throat that was bacterial pathogen positive (weighted mean difference 5.3, 95% CI 8.0 to 2.6, p<0.001; four RCTs) and trials of patients with severe sore throat (weighted mean difference 7.2 hours, 95% CI 10.0 to 4.3, p<0.001; two RCTs). There were some discrepancies in the results reported in the text and tables for mean time to onset of pain relief; the data reported here were presented in the tables. Subgroup analyses in trials with children only showed no significant differences between intervention and controls in mean time to onset of pain relief.

The findings for trials that measured time to complete resolution of symptoms were inconsistent and could not be pooled due to heterogeneity. Secondary outcomes were reported in the review.

Authors’ conclusions
Corticosteroids administered with antibiotics provided symptomatic pain relief in patients with sore throat, mainly those with severe or exudative sore throat.

CRD commentary
The review question and inclusion criteria were clear. An appropriate search strategy was undertaken using five electronic databases. It was not possible to assess for publication bias due to the small number of trials, so publication bias cannot be ruled out completely. There was no apparent search for unpublished data, which meant that potentially relevant studies may have been missed. Validity was assessed using appropriate criteria and the quality of the included studies was reported to be high. Suitable methods were used throughout the review process to minimise the risk of reviewer error and bias. Appropriate methods were used to combine the data and account for statistical heterogeneity. The authors acknowledged certain limitations with the included studies, such as the use of antibiotics in all trials (including control patients). The included studies were also limited by the small number of trials and small sample sizes, and confidence intervals were wide for some outcomes, which may have affected the robustness of the results. This was a generally well-conducted review. The authors’ conclusions appeared to reflect the evidence presented, but the limitations of the included studies, including the generalisability of the findings, should be borne in mind when interpreting the results.

Implications of the review for practice and research
Practice: The authors stated that patients with severe sore throat would benefit from a single dose of corticosteroids. The authors also stated that the results may not be generalisable to European populations and the effects of corticosteroids in children remained uncertain.

Research: The authors stated that further trials that investigated the use of corticosteroids in Europeans, children and antibiotic-naïve patients were warranted. Future research should include the measurement of symptom resolution at 72 hours, standardised pain scores and should be large enough to assess adverse events and days missed from school or work. Further research should also focus on the effects of corticosteroids on antibiotics and measure longer-term outcomes such as re-attendance with recurrent sore throats.
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