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[Intervention Review]

Inhaled corticosteroids for bronchiectasis

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ABSTRACT

Background

Bronchiectasis is being increasingly diagnosed and recognised as an important contributor to chronic lung disease in both adults and children in high- and low-income countries. It is characterised by irreversible dilatation of airways and is generally associated with airway inflammation and chronic bacterial infection. Medical management largely aims to reduce morbidity by controlling the symptoms, reduce exacerbation frequency, improve quality of life and prevent the progression of bronchiectasis. This is an update of a review first published in 2000.

Objectives

To evaluate the efficacy and safety of inhaled corticosteroids (ICS) in children and adults with stable state bronchiectasis, specifically to assess whether the use of ICS: (1) reduces the severity and frequency of acute respiratory exacerbations; or (2) affects long-term pulmonary function decline.

Search methods

We searched the Cochrane Register of Controlled Trials (CENTRAL), the Cochrane Airways Group Register of trials, MEDLINE and Embase databases. We ran the latest literature search in June 2017.

Selection criteria

All randomised controlled trials (RCTs) comparing ICS with a placebo or no medication. We included children and adults with clinical or radiographic evidence of bronchiectasis, but excluded people with cystic fibrosis.

Data collection and analysis

We reviewed search results against predetermined criteria for inclusion. In this update, two independent review authors assessed methodological quality and risk of bias in trials using established criteria and extracted data using standard pro forma. We analysed treatment as 'treatment received' and performed sensitivity analyses.

Main results

The review included seven studies, involving 380 adults. Of the 380 randomised participants, 348 completed the studies.

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Due to differences in outcomes reported among the seven studies, we could only perform limited meta-analysis for both the short-term ICS use (6 months or less) and the longer-term ICS use (> 6 months).

During stable state in the short-term group (ICS for 6 months or less), based on the two studies from which data could be included, there were no significant differences from baseline values in the forced expiratory volume in the first second (FEV₁) at the end of the study (mean difference (MD) -0.09, 95% confidence interval (CI) -0.26 to 0.09) and forced vital capacity (FVC) (MD 0.01 L, 95% CI -0.16 to 0.17) in adults on ICS (compared to no ICS). Similarly, we did not find any significant difference in the average exacerbation frequency (MD 0.09, 95% CI -0.61 to 0.79) or health-related quality of life (HRQoL) total scores in adults on ICS when compared with no ICS, though data available were limited. Based on a single non-placebo controlled study from which we could not extract clinical data, there was marginal, though statistically significant improvement in sputum volume and dyspnoea scores on ICS.

The single study on long-term outcomes (over 6 months) that examined lung function and other clinical outcomes, showed no significant effect of ICS on any of the outcomes. We could not draw any conclusion on adverse effects due to limited available data.

Despite the authors of all seven studies stating they were double-blind, we judged one study (in the short duration ICS) as having a high risk of bias based on blinding, attrition and reporting of outcomes. The GRADE quality of evidence was low for all outcomes (due to non-placebo controlled trial, indirectness and imprecision with small numbers of participants and studies).

Authors' conclusions

This updated review indicates that there is insufficient evidence to support the routine use of ICS in adults with stable state bronchiectasis. Further, we cannot draw any conclusion for the use of ICS in adults during an acute exacerbation or in children (for any state), as there were no studies.

PLAIN LANGUAGE SUMMARY

Role of inhaled corticosteroids (ICS) in the management of bronchiectasis

Background

Bronchiectasis is a lung disease. People with bronchiectasis often experience long-term symptoms such as productive or wet cough, repeated flare-ups (exacerbations) and poor quality of life. People with bronchiectasis have airway inflammation and many have asthmalike symptoms (such as cough and wheeze). Because of this, inhaled corticosteroids (ICS), commonly used in asthma, might also improve symptoms, reduce flare-ups and/or reduce worsening of lung function for people with bronchiectasis. However, routine use of ICS may also cause unwanted side effects.

Review question

What are the benefits of using ICS regularly in the management of adults and children with bronchiectasis?

Study characteristics

We included studies that compared ICS with no ICS, or with a placebo (i.e. a medication made to look the same as ICS but with no active ingredients). We only included studies where it was decided at random who would receive ICS and who would not. The participants included in the seven studies were 380 adults who had bronchiectasis diagnosed by symptoms or from a detailed lung scan (computed tomography (CT)). We did not include studies that involved participants with cystic fibrosis, which can also cause bronchiectasis. Although we planned to include studies involving children with bronchiectasis, we did not find such studies.

What evidence did we find?

From available evidence up to June 2017, we found seven eligible studies involving adult participants that examined the role of ICS in bronchiectasis. The adults had stable bronchiectasis - they were not having a flare-up at the start of the study.

We were able to include results from two studies that gave ICS for less than six months to adults with stable bronchiectasis. ICS did not make a difference to lung function, number of exacerbations during the study or quality of life. In a different study, which also gave ICS for less than six months, we found a small reduction in sputum (phlegm) and improvement in breathlessness. However, as these results were from a study which did not use a placebo we cannot be certain about them.

The single study on long-term use of ICS (i.e. for over 6 months) showed no meaningful benefit of ICS for any of the outcomes.

There were no studies conducted when the participants were having a flare-up of their bronchiectasis. There were also no studies that involved children with bronchiectasis. Importantly, we do not know if ICS are linked to more unwanted side effects, because the studies did not provide much information about this.

Conclusion

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The review found that there is not enough evidence for the routine use of ICS in adults with stable bronchiectasis. We can make no conclusions about the use of ICS for flare-ups of bronchiectasis, or about their use in children, because we did not find any studies.

Quality of evidence

Overall, we judged the quality of evidence to be low. We were concerned because the largest study, which showed some benefits, did not use a placebo. This means that participants and staff in the study would have known who was getting ICS and who was not, which could affect the results. Also, our confidence was reduced because we only found a small number of studies to include in our review and some of the studies may have included people with other types of lung disease, in addition to bronchiectasis.