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Oral non-steroidal anti-inflammatory drug therapy for lung disease in cystic fibrosis

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Study design (if review, criteria of inclusion for studies)

Randomized controlled trials comparing oral NSAIDs, at any dose for at least two months, to placebo in people with CF.

List of included studies (4)

Konstan 1991; Konstan 1995; Lands 2007; Sordelli 1994

Participants

Children and adults, of any age, with defined CF, diagnosed clinically and by quantitative sweat chloride testing or genetic testing or both. People with CF at all stages of lung disease were included.

Interventions

Oral nonsteroidal anti-inflammatory drug

Outcome measures

Annual rate of change in % ideal body weight; Annual rate of change in % ideal body weight (split by age); Annual rate of change in % predicted FEF25-75%; Annual rate of change in % predicted FEF25-75% (split by age); Annual rate of change in % predicted FEV1; Annual rate of change in % predicted FEV1 (split by age); Annual rate of change in % predicted FVC; Annual rate of change in % predicted FVC (split by age); Chest X-ray score; Chest X-ray score (split by age); Decrease in abdominal pain; Decrease in conjunctivitis; Decrease in epistaxis; Increase in abdominal pain; Increase in conjunctivitis; Increase in diarrhoea; Increase in epistaxis; Increase in nausea; Number of deaths; Occult blood; Proportion with at least one gastrointestinal hospitalisation; Proportion with at least one hospital admission; Proportion with at least one respiratory hospitalisation; Stool frequency

Main results

The searches identified 17 trials; four are included (287 participants aged five to 39 years; maximum follow-up of four years) and one is currently awaiting classification pending publication of the full trial report and two are ongoing. Three trials compared ibuprofen to placebo (two from the same center with some of the same participants); one trial assessed piroxicam versus placebo.The three ibuprofen trials were deemed to have good or adequate methodological quality, but used various outcomes and summary measures. Reviewers considered measures of lung function, nutritional status, radiological assessment of pulmonary involvement, intravenous antibiotic usage, hospital admissions, survival and adverse effects. Combined data from the two largest ibuprofen trials showed a lower annual rate of decline for lung function, % predicted forced expiratory volume in one second (FEV1), mean difference (MD) 1.32 (95% confidence interval (CI) 0.21 to 2.42) (moderate-quality evidence); forced vital capacity (FVC), MD 1.27 (95% CI 0.26 to 2.28) (moderate-quality evidence); forced expiratory flow (FEF25%-75%), MD 1.80 (95% CI 0.15 to 3.45). The post hoc analysis of data from two trials split by age showed a slower rate of annual decline of FEV1 % predicted and FVC in the ibuprofen group in younger children, MD 1.41% (95% CI 0.03 to 2.80) (moderate-quality evidence) and MD 1.32% (95% CI 0.04 to 2.60) (moderate-quality evidence) respectively. Data from four trials demonstrated the proportion of participants with at least one hospitalization may be slightly lower in the ibuprofen group compared to placebo, Peto odds ratio 0.61 (95% CI 0.37 to 1.01) (moderate-quality evidence). In one trial, long-term use of high-dose ibuprofen was associated with reduced intravenous antibiotic usage, improved nutritional and radiological pulmonary status. No major adverse effects were reported, but the power of the trials to identify clinically important differences in the incidence of adverse effects was low.We did not have any concerns with regards to risk of bias for the trial comparing piroxicam to placebo. However, the trial did not report many data in a form that we could analyze in this review. No data were available for the review's primary outcome of lung function; available data for hospital admissions showed no difference between the groups. No analyzable data were available for any other review outcome.

Authors' conclusions

High-dose ibuprofen can slow the progression of lung disease in people with cystic fibrosis, especially in children, which suggests that strategies to modulate lung inflammation can be beneficial for people with cystic fibrosis.

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See also

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Keywords

Anti-Inflammatory Agents; Oral; pharmacological_intervention; Anti-Inflammatory Agents - excl Steroids;