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[Intervention Review]

Antibiotic strategies for eradicating Pseudomonas aeruginosa in people with cystic fibrosis

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ABSTRACT

Background

Lower respiratory tract infection with *Pseudomonas aeruginosa* occurs in most people with cystic fibrosis (CF). Once chronic infection is established, *Pseudomonas aeruginosa* is virtually impossible to eradicate and is associated with increased mortality and morbidity. Early infection may be easier to eradicate.

Objectives

To determine whether antibiotic treatment of early *Pseudomonas aeruginosa* infection in children and adults with CF eradicates the organism, improves clinical and microbiological outcome and is superior to or more cost-effective than other strategies.

Search methods

We searched the Cochrane CF and Genetic Disorders Group Trials Register comprising references identified from comprehensive electronic database searches and handsearches of relevant journals and abstract books of conference proceedings.

Most recent search: 11 December 2008.

Selection criteria

We included randomised controlled trials (RCTs) of people with CF, in whom *Pseudomonas aeruginosa* had recently been isolated from respiratory secretions. We compared combinations of inhaled, oral or intravenous antibiotics with placebo, usual treatment or other combinations of inhaled, oral or intravenous antibiotics. We excluded non-randomised trials, cross-over trials, and those utilising historical controls.

Data collection and analysis

Both authors independently selected trials, assessed methodological quality and extracted data.

Main results

The search identified 25 trials. Four trials (95 participants) were eligible for inclusion; two trials are ongoing. Evidence from two trials showed treatment of early *Pseudomonas aeruginosa* infection with inhaled tobramycin results in microbiological eradication of the organism from respiratory secretions more often than placebo, OR 0.15 (95% CI 0.03 to 0.65) and that this effect may persist for up to 12 months. These trials were of low methodological quality.

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The only identified RCT of oral ciprofloxacin and nebulised colistin versus usual treatment was of poor methodological quality. Results suggested treatment of early infection results in microbiological eradication of *Pseudomonas aeruginosa* more often than usual treatment, after two years, OR 0.24 (95% CI 0.06 to 0.96). There is insufficient evidence to determine whether antibiotic strategies for the eradication of early *Pseudomonas aeruginosa* decrease mortality or morbidity, improve quality of life, or are associated with adverse effects compared to placebo or standard treatment.

Authors' conclusions

We found that nebulised antibiotics, alone or in combination with oral antibiotics, were better than no treatment for early infection with *Pseudomonas aeruginosa*. Eradication may be sustained in the short term. Overall, there is insufficient evidence from this review to state which antibiotic strategy should be used for the eradication of early *Pseudomonas aeruginosa* infection in CF.

PLAIN LANGUAGE SUMMARY

Different ways of giving antibiotics to remove *Pseudomonas aeruginosa* infection in people with CF

Cystic fibrosis is an inherited condition where the airways frequently become blocked with mucus, often associated with respiratory infections. These infections may lead to progressive respiratory failure and death from breathing failure. A germ called *Pseudomonas aeruginosa* is a frequent cause of infection. We wanted to compare different combinations of inhaled, oral and intravenous antibiotics. There are four trials included in the review. Two trials are still ongoing. We found that when treating early infection, nebulised antibiotics were better than no treatment in eliminating the germ in most people. This was also true for a combination of nebulised and oral antibiotics. The trials had quite a short follow-up period. Therefore, we could not show whether treatment made people with cystic fibrosis feel better or live longer. Further research is needed to see whether removing the germ completely improves the well-being and quality of life in people with cystic fibrosis. There have not yet been satisfactory trials comparing outcomes for people with cystic fibrosis treated with oral or intravenous antibiotics.

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