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Single versus combination intravenous anti-pseudomonal antibiotic therapy for people with cystic fibrosis

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

Randomised controlled trials (RCTs) comparing a single intravenous antibiotic with a combination of that antibiotic plus a second antibiotic in people with CF.

List of included studies (8)

Costantini 1982; Huang 1982; Master 1997; McCarty 1988; McLauglin 1983; Parry 1977; Pedersen 1986; Smith 1999

Participants

Children and adults with defined CF diagnosed clinically and by sweat or genetic testing including all ages and all degrees of severity.

Interventions

Single (aminoglycosides or beta lactams) intravenous antibiotic therapy regimen

Outcome measures

Mean change Pseudomonas density in cfu/g at end of course; Mean FEV1 at end of course (% pred); Mean FVC at end of course (% pred); Mean MMEF at end of course (% pred); Mean PFR at end of course (% pred); Mean RV at end of course (% pred); Mean RV/TLC at end of course (% pred); Mean Schwachman score at end of course; Mean time to next course of antibiotics (weeks); Mean TLC at end of course (% pred); Mean WBC count at end of course; Number adverse events; Number of Pseudomonas isolates eradicated at end of course; Number readmitted; Number resistant strains

Main results

We identified 59 trials, of which we included eight trials (356 participants) comparing a single antiâ€•pseudomonal agent to a combination of the same antibiotic and one other. There was a wide variation in the individual antibiotics used in each trial. In total, the trials included seven comparisons of a betaâ€•lactam antibiotic (penicillinâ€•related or third generation cephalosporin) with a betaâ€•lactamâ€•aminoglycoside combination and three comparisons of an aminoglycoside with a betaâ€•lactamâ€•aminoglycoside combination. There was considerable heterogeneity amongst these trials, leading to difficulties in performing the review and interpreting the results. These results should be interpreted cautiously. Six of the included trials were published between 1977 and 1988; these were singleâ€•centre trials with flaws in the randomisation process and small sample size. Overall, the methodological quality was poor and the certainty of the evidence ranged from low to moderate. The review did not find any differences between monotherapy and combination therapy in either the short term or in the long term for the outcomes of different lung function measures, bacteriological outcome measures, need for additional treatment, adverse effects, quality of life or symptom scores.

Authors' conclusions

The results of this review are inconclusive. The review raises important methodological issues. There is a need for an RCT which needs to be wellâ€•designed in terms of adequate randomisation allocation, blinding, power and longâ€•term followâ€•up. Results need to be standardised to a consistent method of reporting, in order to validate the pooling of results from multiple trials.

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See also

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Keywords

Aminoglycosides; Anti-Bacterial Agents; Bacterial Infections; Cephalosporins; Combined Modality Therapy; Infection; Intravenous; pharmacological_intervention; Respiratory Tract Diseases; Respiratory Tract Infections;