Cochrane Database of Systematic Reviews - - Cochrane Review

Nebulized and oral thiol derivatives for pulmonary disease in cystic fibrosis

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

Randomized and quasi-randomized controlled trials comparing nebulized or oral thiol derivatives to placebo or another thiol derivative in people with cystic fibrosis.

List of included studies (9)

Bishop 2005; Caramia 1995; Dauletbaev 2009; Howatt 1966; Mitchell 1982; Ratjen 1985; Stafanger 1988; Stafanger 1989; Weller 1980

Participants

All individuals diagnosed with CF based on standard diagnostic criteria (sweat testing or genetics and clinical features or family history) were included. There were no restrictions on pulmonary disease severity, gender, or pancreatic status.

Interventions

Nebulized thiols; Oral thiols

Outcome measures

Antibiotic treatment [weeks]; Change in flow 25% FVC [% predicted]; Change in flow 50% FVC [% predicted]; Change in flow 75% FVC [% predicted]; Change in forced expiratory volume in 1 sec/vital capacity [% predicted]; Change in forced expiratory volume in 1 second; Change in forced expiratory volume in 1 second [% predicted]; Change in forced vital capacity; Change in peak expiratory flow [% predicted]; Change in residual volume/total lung capacity [% predicted]; Change in thoracic gas volume [% predicted]; Change in total gas volume [% predicted]; Change in total lung capacity [% predicted]; Change in vital capacity [% predicted]; Forced expiratory flow 25-75; Peak expiratory flow; Peak expiratory flow [L/min]; RV/TLC; Six-minute walk test [metres]; Sputum viscosity; Vmax50% Vital capacity

Main results

Searches identified 23 trials; nine trials (255 participants) are included, of these seven trials are more than 10 years old. Three trials of nebulized thiol derivatives were identified (one compared 20% N-acetylcysteine to 2% N-acetylcysteine; another compared sodium-2-mercaptoethane sulphonate to 7% hypertonic saline; and another compared glutathione to 4% hypertonic saline). Although generally well-tolerated with no significant adverse effects, there was no evidence of significant clinical benefit in our primary outcomes in participants receiving these treatments. Six trials of oral thiol derivatives were identified. Three trials compared N-acetylcysteine to placebo; one compared N-acetylcysteine, ambroxol and placebo; one compared carbocysteine to ambroxol; and one compared low and high-dose N-acetylcysteine. Oral thiol derivatives were generally well-tolerated with no significant adverse effects, however there was no evidence of significant clinical benefit in our primary outcomes in participants receiving these treatments.

Authors' conclusions

Authors' conclusions: We found no evidence to recommend the use of either nebulized or oral thiol derivatives in people with cystic fibrosis. There are very few good quality trials investigating the effect of these medications in cystic fibrosis, and further research is required to investigate the potential role of these medications in improving the outcomes of people with cystic fibrosis.

http://onlinelibrary.wiley.com/doi/10.1002/14651858.CD007168.pub3/abstract

See also

Nash EF, Stephenson A, Ratjen F, Tullis E. Nebulized and oral thiol derivatives for pulmonary disease in cystic fibrosis. Cochrane Database of Systematic Reviews 2013, Issue 7 Art. No.: CD007168. doi: 10.1002/14651858.CD007168.pub3

Keywords

Acetylcysteine; Ambroxol; Antioxidants; Carbocysteine; Inhalation OR nebulised; Oral; pharmacological_intervention; thiols; Airway clearance drugs -expectorants- mucolytic- mucociliary-; Hypertonic Solutions; hydration; Glutathione; Respiratory System Agents; Mucosolvan; Respiratory Tract Diseases;