HTA - - Health Technology Assessment Report

Short-term effects of positive expiratory pressure mask on ventilation inhomogeneity in children with cystic fibrosis: A randomized, sham-controlled crossover study.

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

Systematic literature review (search date February 2023). Network meta-analyses were conducted where head-to-head data were not available

List of included studies

Data from 19 primary studies and 7 open-label extension studies were prioritised in the systematic literature review.

Participants

Searching electronic databases (MEDLINE, EMBASE, Cochrane Central Register of Controlled Trials), bibliographies of relevant systematic literature reviews, clinical trial registers, recent conferences and evidence provided by Vertex Pharmaceuticals (Boston, MA, USA). OBJECTIVES: To appraise the clinical effectiveness and cost-effectiveness of elexacaftor-tezacaftor-ivacaftor, tezacaftor-ivacaftor and lumacaftor-ivacaftor within their expected marketing authorisations for treating people with cystic fibrosis and at least one F508del mutation, compared with each other and with established clinical management before these treatments.

Interventions

Eelexacaftor-tezacaftor-ivacaftor, tezacaftor-ivacaftor and lumacaftor-ivacaftor

Outcome measures

Acute change in per cent predicted forced expiratory volume in 1 second (change in weight-for-age z-score; and change in pulmonary exacerbation frequency requiring intravenous antibiotics. Long-term effectiveness. Cost-effectiveness of the three modulator treatments.

Main results

Elexacaftor/tezacaftor/ivacaftor was associated with a statistically significant increase in predicted forced expiratory volume in 1 second and weight-for-age z-score and a reduction in pulmonary exacerbations compared with established clinical management, lumacaftor/ivacaftor and tezacaftor/ivacaftor, and also led to a reduction in the rate of predicted forced expiratory volume in 1 second decline relative to established clinical management, although the magnitude of this decrease was uncertain. Lumacaftor/ivacaftor and tezacaftor/ivacaftor were also associated with a statistically significant increase in predicted forced expiratory volume in 1 second and reduction in pulmonary exacerbations relative to established clinical management, but with a smaller effect size than elexacaftor/tezacaftor/ivacaftor. There was some evidence that tezacaftor/ivacaftor reduced the rate of predicted forced expiratory volume in 1 second decline relative to established clinical management, but little evidence that lumacaftor/ivacaftor reduced the rate of predicted forced expiratory volume in 1 second decline relative to established clinical management. The incremental cost-effectiveness ratios from the economic analysis were confidential. However, for all genotypes studied the incremental cost-effectiveness ratios were above what would be considered cost-effective based on the National Institute for Health and Care Excellence threshold of £20,000-30,000 per quality-adjusted life-year gained.

Authors' conclusions

Despite the improved clinical benefits observed, none of the cystic fibrosis transmembrane conductance regulator gene modulators assessed would be considered cost-effective based on the National Institute for Health and Care Excellence threshold of £20,000-30,000 per quality-adjusted life-year gained. This is largely driven by the high acquisition costs of cystic fibrosis transmembrane conductance regulator gene modulator treatments.

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See also

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Keywords

Adult; Aged; CFTR Modulators; Genetic Predisposition to Disease; pharmacological_intervention; placebo; VX-770; VX-661; ivacaftor; Aminophenols; tezacaftor; VX-445; elexacaftor; Trikafta; Child; Adolescent; Orkambi; lumacaftor; VX-809; Symkevi; Symdeco; kaftrio;