Supplemental Oxygen Therapy for Pulmonary Fibrosis During Exertion: Clinical Effectiveness, Cost-Effectiveness and Guidelines
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Acknowledgments:

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Research Questions

1. What is the clinical effectiveness of supplemental oxygen therapy for adults with pulmonary fibrosis during exertion?

2. What is the cost-effectiveness of supplemental oxygen therapy for adults with pulmonary fibrosis during exertion?

3. What are evidence-based guidelines informing the use of supplemental oxygen therapy for adults with pulmonary fibrosis during exertion?

Key Findings

Two systematic reviews, one randomized controlled trial, and one non-randomized study were identified regarding the clinical effectiveness of supplemental oxygen therapy for adults with pulmonary fibrosis during exertion. In addition, two evidence-based guidelines were identified that informed the use of supplemental oxygen therapy for adults with pulmonary fibrosis during exertion.

Methods

A limited literature search was conducted on key resources including PubMed, The Cochrane Library, University of York Centre for Reviews and Dissemination (CRD) databases, Canadian and major international health technology agencies, as well as a focused Internet search. No methodological filters were applied to limit retrieval by study type. Where possible, retrieval was limited to the human population. The search was also limited to English language documents published between January 1 2013 and May 1 2018. Internet links were provided, where available.

Selection Criteria

One reviewer screened citations and selected studies based on the inclusion criteria presented in Table 1.

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<td>Populations</td>
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Results

Rapid Response reports are organized so that the higher quality evidence is presented first. Therefore, health technology assessment reports, systematic reviews, and meta-analyses are presented first. These are followed by randomized controlled trials, non-randomized studies, economic evaluations, and evidence-based guidelines.

Two systematic reviews, one randomized controlled trial, and one non-randomized study were identified regarding the clinical effectiveness of supplemental oxygen therapy for adults with pulmonary fibrosis during exertion. In addition, two evidence-based guidelines were identified that informed the use of supplemental oxygen therapy for adults with pulmonary fibrosis during exertion. No relevant health technology assessments or economic evaluations were identified.

Additional references of potential interest are provided in the appendix.

Overall Summary of Findings

Two systematic reviews,1,2 one randomized controlled trial,3 and one non-randomized study4 were identified regarding the clinical effectiveness of supplemental oxygen therapy for adults with pulmonary fibrosis (PF) or interstitial lung disease (ILD) during exertion.

The authors of one systematic review1 concluded that there were no effects of oxygen therapy on dyspnea (labored breathing) when patients with ILD were examined during exercise. However, they did note that exercise capacity was increased.1 The authors of another systematic review2 that sought to examine the effects of ambulatory and short-burst oxygen on exercise, quality of life, and dyspnea in patients with ILD concluded that there was not evidence to either support or refute ambulatory or short-burst oxygen use in these patients.

In a randomized controlled trial, Nishiyama et al.3 observed no additional benefit of air over ambulatory oxygen during exertion in patients with idiopathic PF without resting hypoxemia but who had desaturation upon exercise. They recommended against the use of routine ambulatory oxygen in this population.3 Downman et al.4 examined the effects of oxygen (at a fraction of inspired oxygen [\(\text{FiO}_2\)] of 0.50) or compressed air during exercise in 11 patients with idiopathic PF. They observed a reduction in dyspnea, an alleviation of exercise-induced hypoxemia, and increased exercise tolerance with oxygen at an \(\text{FiO}_2\) of 0.50.4

Two evidence-based guidelines5,6 were identified that informed the use of supplemental or ambulatory oxygen therapy (AOT) for adults with lung disease during exertion. The British Thoracic Society recommends the following:

- "AOT should not be routinely offered to patients who are not eligible for long-term oxygen therapy. (Grade B)"5

- "AOT should not be routinely offered to patients already on long-term oxygen therapy. (Grade D)"5

- "AOT assessment should only be offered to patients already on LTOT if they are mobile outdoors. (Grade A)"5
“AOT should be offered to patients for use during exercise in a pulmonary rehabilitation programme or during an exercise programme following a formal assessment demonstrating improvement in exercise endurance. (Grade B)”

It should be noted, however, that most of the studies informing the aforementioned recommendations were not performed in patients with ILD or idiopathic PF. The British Thoracic Society provided some “good practice points” that stated that patients with ILD who do not desaturate upon exercise but do not qualify for long-term oxygen therapy may benefit from AOT following a formal assessment. In addition, patients with high respiratory rates should receive AOT using a Venturi mask that can exceed their peak exertional inspiratory and tidal peak flow.5

The National Institute for Health and Care Excellence (NICE) states that there should be an assessment regarding the causes of breathlessness, the degree of hypoxia, and the potential for AOT in patients with PF who are breathless upon exertion.6

No economic evaluations were identified; therefore, no summary can be provided.

References Summarized

Health Technology Assessments
No literature identified.

Systematic Reviews and Meta-analyses


Randomized Controlled Trials

Non-Randomized Studies

Economic Evaluations
No literature identified.
Guidelines and Recommendations

See: AMBULATORY OXYGEN THERAPY, page i18

See: Best supportive care, page 8
Appendix — Further Information

Randomized Controlled Trials – Protocol


Non-Randomized Studies

Alternative Population (Interstitial Lung Disease) and Alternative Outcome


Alternative Intervention/Outcome


Review Articles
