Cochrane Database of Systematic Reviews - - Cochrane Review

Respiratory muscle training for cystic fibrosis

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

Randomised or quasi-randomised clinical controlled trials comparing different inspiratory muscle training regimens with each other or a control in people with cystic fibrosis.

List of included studies (10)

Albinni 2004; Amelina 2006; Asher 1983; Bieli 2017; Chatham 1997; de Jong 2001; Enright 2004; Heward 2000; Sawyer 1993

Participants

People with CF, of any age, diagnosed by clinical criteria, sweat test or genotyping or both.

Interventions

Inspiratory muscle training (IMT) (as achieved by voluntary isocapnic hyperpnoea, resistive loading or threshold loading) vs each other or with no or sham IMT

Outcome measures

Primary outcomes: 1. Health-related quality of life - Chronic Respiratory Disease Questionnaire (emotion); Chronic Respiratory Disease Questionnaire (mastery); 2. Pulmonary function tests (performed at rest): i) forced expiratory volume at one second (FEV1) ii) forced vital capacity (FVC) 3. Exercise tolerance: i) field-based tests ii) laboratory-based tests

Main results

Authors identified 20 studies, of which 10 studies with 238 participants met the review's inclusion criteria. There was wide variation in the methodological and written quality of the included studies. Four of the 10 included studies were published as abstracts only and lacked concise details, thus limiting the information available. Eight studies were parallel studies and two of a crossâ€•over design. Respiratory muscle training interventions varied dramatically, with frequency, intensity and duration ranging from thrice weekly to twice daily, 20% to 80% of maximal effort, and 10 to 30 minutes, respectively. Participant numbers ranged from 11 to 39 participants in the included studies; five studies were in adults only, one in children only and four in a combination of children and adults. No differences between treatment and control were reported in the primary outcome of pulmonary function (forced expiratory volume in one second and forced vital capacity) or postural stability (very lowâ€•quality evidence). Although no change was reported in exercise capacity as assessed by the maximum rate of oxygen use and distance completed in a six minute walk test, a 10% improvement in exercise duration was found when working at 60% of maximal effort in one study (n = 20) (very lowâ€•quality evidence). In a further study (n = 18), when working at 80% of maximal effort, healthâ€•related quality of life improved in the mastery and emotion domains (very lowâ€•quality evidence). With regards to the review's secondary outcomes, one study (n = 11) found a change in intramural pressure, functional residual capacity and maximal inspiratory pressure following training (very lowâ€•quality evidence). Another study (n=36) reported improvements in maximal inspiratory pressure following training (P

Authors' conclusions

There is insufficient evidence to suggest whether this intervention is beneficial or not. Healthcare practitioners should consider the use of respiratory muscle training on a caseâ€•byâ€•case basis. Further research of reputable methodological quality is needed to determine the effectiveness of respiratory muscle training in people with cystic fibrosis. Researchers should consider the following clinical outcomes in future studies; respiratory muscle function, pulmonary function, exercise capacity, hospital admissions, and healthâ€•related quality of life. Sensoryâ€•perceptual changes, such as respiratory effort sensation (e.g. rating of perceived breathlessness) and peripheral effort sensation (e.g. rating of perceived exertion) may also help to elucidate mechanisms underpinning the effectiveness of respiratory muscle training.

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See also

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Keywords

Adolescent; Adult; Inhalation OR nebulised; non pharmacological intervention - psyco-soc-edu-org; non pharmacological intervention - devices OR physiotherapy; pharmacological_intervention; training; inspiratory muscle training; exercise; Chest physiotherapy;