276 Posture in adult inpatients with cystic fibrosis

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Objective: To evaluate the short-term effects of musculoskeletal (MSK) physiotherapy on posture, lung function and health related quality of life (HRQoL) in adults with cystic fibrosis admitted for a respiratory exacerbation.
Method: A single blind prospective randomised controlled design. Subjects were recruited on admission and randomised to a treatment or control group. The treatment group received MSK assessment and were given MSK treatment on alternate days during their inpatient stay. The control group received normal optimal care. A blinded, independent observer measured both groups on days 0, 5, 10 and before discharge. Posture using thoracic index (TI), lung function and HRQoL (Brompton Cystic Fibrosis Questionnaire, BCFQ) were measured. Data were analysed using descriptive statistics and linear regression.
Result: Fifty-three patients (57% male) mean age 27.6 years (SD 10.3), mean forced expiratory volume in one second (FEV_1) 1.05L (SD 0.8) were recruited. There were no differences between the groups at baseline. The improvements in TI, FEV_1 and FVC were greater per unit time (shown by linear regression) in the treatment than the control group with differences of 1 ratio unit, 0.2L and 0.4L respectively. The control group showed an increase (worsening) in TI at 5 days. None of these were statistically significant. BCFQ improved statistically significantly in the treatment group ($p = 0.04$).
Conclusion: There were no statistically significant differences in posture or lung function between the two groups, but further work to determine the minimally important clinical difference in TI may explain whether the improvements in HRQoL could be due to postural improvements.

277 Thoracic kyphosis in cystic fibrosis: a challenge for children?

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Rationale: Postural problems and declining lung function are evident in adults with cystic fibrosis. It has been assumed that these problems develop during childhood or adolescence and are related. However, limited evidence is available to demonstrate this.
Objectives: The aim of this study is to establish at what age thoracic kyphosis becomes evident in children with cystic fibrosis and to determine the relationship between thoracic kyphosis and lung function.
Design and Method: This retrospective study uses 74 sets of annual review data taken from children with cystic fibrosis aged 8 to 16 years. Thoracic kyphosis is measured using an alternative Cobb Method (2 line method on lateral chest x-ray), lung function via spirometry and disease severity using the Shwachman scoring system. Correlations between these measures and age are explored using Pearson's Product Moment Tests.
Results: Increased thoracic kyphosis is not widely evident in the study population and there is no relationship between thoracic kyphosis and age. There is, however, a relationship between lung function and degree of thoracic kyphosis in females. This finding cannot be fully explained but it is consistent with the generally poorer outcomes for females with cystic fibrosis.
Conclusions: Thoracic kyphosis is not a significant problem for young people with cystic fibrosis but can occur in specific cases. Monitoring is required to identify the few cases that could benefit from active intervention. Studies of older age groups may bring further understanding of increasing thoracic kyphosis in people with cystic fibrosis.
Keywords: Thoracic kyphosis, cystic fibrosis, children, Cobb Method, lung function

278 Use of Positive Expiratory Pressure physiotherapy in Australian children with cystic fibrosis under five years of age

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Physiotherapy management of cystic fibrosis (CF) has evolved with many international variations. Positive Expiratory Pressure (PEP) physiotherapy airway clearance theory includes both volume change via collateral ventilation, and airway stabilisation. Australian children with CF often start PEP prior to school commencement, around 5 years of age. From infant diagnosis, this prospective investigation (ACFBAL study) included records of physiotherapy approaches used in the first 5 years. Baseline, exacerbation, routine and final outcome reviews were analysed separately. PEP alone or used as an adjunct was compared to other techniques. 170 children (Mean age 3.6 mths, SD 1.6) from 8 Australasian sites were enrolled. 62% of children used PEP during the study, median age of introduction 3.85 yrs (IQR 2.65, 4.59; Range 0.23, 5.26). 44% used PEP at final outcome. 12% of the cohort were diagnosed with significant tracheomalacia (TM) at some time, however there was no association between barking or croupy coughs typically associated with malacia. Only 7% of children with TM used PEP at final outcome. 72% of PEP users had a cough compared with 40% of the cohort. Reasons for early initiation of PEP may include the presence of persistent cough, physiotherapist familiarity with PEP, or unexpected bronchoscopy findings indicating need for changed therapy regimen. Our expectation that early use of PEP would be associated with barking or croupy cough; nocturnal cough, and/or malacia was not supported. Further systematic study of this emerging trend is warranted, particularly where airway malacia is identified in young children.

279 Should high frequency chest wall oscillation be considered in acute pulmonary exacerbation in cystic fibrosis adults?

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Background: Due to a lack of published evidence, rather than safety concerns, the BTS Guidelines (2009) recommend HFCWO is not utilised in acute exacerbation in CF adults. The HFCWO (Vest System) has however, been effectively utilised simultaneously with active techniques, such as ACBT and AD within our centre during exacerbation.
Aim: To report use of HFCWO in addition to usual ACT during acute exacerbation. To heighten awareness, promote discussion and enhance consideration of HFCWO.
Method: Audit was undertaken of 71 acute Rx episodes (range 3–35 days, mean 12 days) in 40 CF adults (28 males, 12 females), age 18–46 yrs (mean 35 yrs).
Results: Data collected included lung disease severity, mild ($FEV_1 > 70\%$), n = 11/40 (27%), M 7:F 4. Moderate disease (FEV_1 41–70%) n = 20/40 (50%), M 11:F 9. Severe disease ($FEV_1 \leqslant 40\%$) n = 9/40 (23%) M 6:F 3. ACT utilised with HFCWO: ACBT, AD, PEP, Flutter, Acapella and NIV. No adverse effect on O_2 sats or HR pre/post Rx. Outcomes: FEV_1 (% predicted, best in 12 mths), mean increase 18% (range –6%, 56%), wet sputum weight increased in 90% patients.
Conclusion: HFCWO utilised simultaneously with usual ACT was well tolerated and perceived of benefit in 90% CF adults. In line with previous research improved sputum clearance, patient satisfaction and no adverse effects or complications were noted. Future study is required to adequately assess effectiveness of this approach, which may benefit CF adults during acute exacerbation.

Reference(s)

Physiotherapy Guideline Development Group on behalf of the British Thoracic Society (2009) Guidelines for the physiotherapy management of the adult, medical, spontaneously breathing patient, *Thorax* 2009; 64; 1–52.