primary studies - published RCT

Chest physiotherapy in cystic fibrosis: improved tolerance with nasal pressure support ventilation.

Code: PM10049988 **Year:** 1999 **Date:** 1999

Author: Fauroux B

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

Randomised, cross-over trial.

Participants

16 participants with CF. Stable participants. Mean (SD) age 13 (4) years.

Interventions

Order of intervention was randomised. Session 1: CPT (10 to 15 forced expiration manoeuvres separated by rest periods) and inspiratory PSV via nasal mask using pressure support generator. Session 2: CPT with no PSV. Sessions 20 minutes. Time between sessions unclear - paper states sessions were conducted on two different days at the same time of day by same physiotherapist.

Outcome measures

FVC; FEV1; PEF; FEF 25%; FEF50%; FEF25-75%; airway resistance; SpO2; RR; PI max; PE max; FEF25-75; sputum weight; subjective participants impressions of fatigue, ease sputum clearance; participant preference (1 = worse to 3 = marked preference).

Main results

Mean lung function parameters were comparable before the PSV and the control sessions. Baseline pulse oximetry (SpO2) was significantly correlated with the baseline vital capacity (% predicted) and forced expiratory volume in 1 second (FEV1) (% predicted). PSV was associated with an increase in tidal volume (Vt) from 0.42 +/- 0.01 liters to 1.0 +/- 0.02 liters. Respiratory rate was significantly lower during PSV. SpO2 between the FET maneuvers was significantly higher during PSV as compared with the control session. SpO2 decreases after FET were significantly larger during the control session (nadir: 91.8 +/- 0. 7%) than during the PSV session (93.8 +/- 0.6%). Maximal pressures decreased during the control session (from 71.9 +/- 6.1 to 60.9 +/- 5.3 cmH2O, and from 85.3 +/- 7.9 to 77.5 +/- 4.8 cmH2O, for PImax and PEmax, respectively) and increased during the PSV session (from 71.6 +/- 8.6 to 83.9 +/- 8.7 cmH2O, and from 80.4 +/- 7.8 to 88.0 +/- 7.4 cmH2O, for PImax and PEmax, respectively). The decrease in PEmax was significantly correlated with the severity of bronchial obstruction as evaluated based on baseline FEV1 (% predicted). Forced expiratory flows did not change after either CPT session. The amount of sputum expectorated was similar for the two CPT sessions (5.3 +/- 5.3 g vs 4.6 +/- 4.8 g after the control and PSV session, respectively; NS). Fifteen patients felt less tired after the PSV session. Ten patients reported that expectoration was easier with PSV, whereas 4 did not note any difference; 2 patients did not expectorate. Nine patients expressed a marked and 5 a small preference for PSV, and 2 patients had no preference. The physiotherapists found it easier to perform CPT with PSV in 14 patients and did not perceive any difference in 2 patients.

Authors' conclusions

Our study in CF children shows that respiratory muscle performance, as evaluated based on various parameters, decreased after CPT and that significant falls in oxygen saturation occurred after the FET maneuvers despite the quiet breathing periods between each FET cycle.

http://dx.doi.org/10.1542/peds.103.3.e32

See also

Pediatrics. 1999 Mar;103(3):E32.

Keywords

Adolescent; Artificial Ventilation; Child; non pharmacological intervention - devices OR physiotherapy; Ventilators; Positive-Pressure Respiration- PEP- pep mask; Airway clearance technique; Chest physiotherapy; forced expiration technique; Active Cycle of Breathing

Technique -ACBT-;