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Course of Severe COPD with and without Physiotherapy with the RC-Cornet®


The efficacy of respiratory physiotherapy by combined-Pep (RC-Cornet® in combined-Pep-position) was evaluated in a long-term study with the following set up.

**STUDY DESIGN:** Randomized prospective clinical trial over 2 years in 50 patients with severe COPD (12 f, 38 m, 63.1 y, FEV 1 41 %, DLCO 51 % of the normal). Patients were without infection and exsmokers at begin of the trial. One group was treated only by drug therapy (theophylline, salmeterol, ipratropium bromide, systemic steroids 5 mg prednisolone equivalent). The second group received the same drug therapy plus physical therapy with the RC-Cornet® (oscillating PEP; in combined PEP-position) 3 times daily at least for 5 minutes or whenever needed. Lung function data were recorded every 3 months during first year and every 4 months in the second year. The compliance was checked by theophylline and cortisol blood levels, inspection of the functionality of the RC-Cornet® and by questioning the patient about compliance with the therapy.

**RESULTS:** TGV (% of normal) and airway resistance (measured by bodyplethysmography) decreased significantly in contrast to the "mere" drug therapy (p < 0.0177, p < 0.0179). VC (% of normal) increased significant p < 0.0179 in the RC-Cornet® therapy group. In this group significantly less patients (13/24) needed antibiotics in comparison to the "mere" drug group (Chi-Quadrat p < 0.0004). Also the need for hospital care was significantly less in the RC-Cornet® group (5/12) in comparison to the drug therapy group (Chi-Quadrat < 0.000765). The length of hospital stay in the two groups was not significantly different: 16.2 +/- 6.3 days in the RC-Cornet®-group and 18.3 +/- 4.7 days in the drug therapy-group.

**CONCLUSION:** This study demonstrates the efficacy of respiratory physiotherapy with combined-Pep in addition to drug therapy in the management of COPD-patients.
Cegla UH, Bautz M, Frode G, Werner T.

Physical therapy in patients with COPD and tracheobronchial instability--comparison of 2 oscillating PEP systems (RC-Cornet®, VRP1 Desitin). Results of a randomized prospective study of 90 patients


STUDY DESIGN: In a randomised prospective study in 90 patients with COPD and tracheobronchial instability 3 groups were formed. Group 1: Therapy as group 3 + Physiotherapy with VRP1 Flutter, Group 2: Therapy as group 3 + Physiotherapy with RC-Cornet®, Group 3: Control group: daily 40 mg prednisolone i.v., 2 x theophylline i.v. in relation to serum levels and 3 x inhalation of beta agonist with a compressor inhaler. Therapy group 1 and 2 received the same drug and inhalation therapy as the controls. Controls of lung function before and after physiotherapy and visual analogue scales for dyspnoea, cough, sputum and acceptance of the physiotherapy were performed at days 1, 4 and 7.

RESULTS: With RC-Cornet® the residual volume decreases statistically significant in comparison to VRP1 Flutter. Hyperventilation is also statistically significant smaller in RC-Cornet® compared to VRP1 Flutter. The subjective improvement of sputum, dyspnoea and acceptance of the method of physiotherapy was statistically significant better for RC-Cornet®. Regarding cough the significance was just failed by p < 0.055.

CONCLUSION: RC-Cornet® is a comfortable, effective, small accepted tool for the long term physiotherapy of patients with COPD and tracheobronchial instability.
RC-Cornet® improves the bronchodilating effect of Ipratropium bromide (Atrovent®) inhalation in COPD-patients


STUDY DESIGN: In 35 patients with severe COPD and tracheal-bronchial instability the bronchodilatory effect of salbutamol (Salbulair® Autohaler) was tested prospectively, randomized and crossover on two consecutive days by bodyplethysmography. Following the salbutamol inhalation, the effect of ipratropium bromide inhalation (by Pariboy and LC-plus-nebulizer) was evaluated in group A with an oscillating PEP-system (RC-Cornet®, Position 1) in the expiratory outlet of the nebulizer and in group B with conventional inhalation by the Pari-system.

RESULTS: The bronchodilatory effect was statistically significant better in group A inhaling ipratropium bromide with the RC-Cornet® in the expiratory limb of the nebulizer in comparison to "normal" inhalation (decrease in airway resistance $p < 0.0002$, increase in vitacapacity $p < 0.0051$, increase in FEV1 $p < 0.0161$, Wilcoxon-Test for matched pairs).

CONCLUSION: Using an oscillating PEP-system in the expiratory outlet of a nebulizer does not only increase the bronchodilatory effect of ipratropium bromide but also shortens the time necessary for therapy in those patients by combining inhalation and physiotherapy.
King M, Feng W, Deng WW, Huang SG, Cheng QJ, Cegla UH

**Short-term efficacy of RC-Cornet® in decreasing cohesiveness of sputum in COPD patients**

*Chest. 1998 113, 318S*

The RC-Cornet® is a recently developed, gravity independent device which produces expiratory airflow oscillations aimed at improving mucus clearance. We wished to evaluate the short term efficacy of Cornet therapy on COPD patients.

**STUDY DESIGN:** Cornet oscillations were produced by expiratory flow through the Cornet set in position 3.5 or 4.0. Ten COPD patients diagnosed by flow volume limitation were randomly selected from hospitalized patients. Pulmonary function (FVC, FEV1, FEV1/FVC), and some clinical symptoms (such as dyspnea) were studied, and sputa were expectorated spontaneously before and after 15 min of Cornet physiotherapy. Spinnability (cohesiveness) and viscoelasticity (G* at 1 and 100 rad/s) of the sputum samples were analyzed by filancemeter and magnetic rheometer.

**RESULTS:** After 15 min treatment, 2 patients felt improvement in their dyspnea, while 8 patients felt no change. There was no significant change of pulmonary function. For mucus viscoelasticity there was a moderate decrease of logG* and a significant change of tanδ (recoil factor) (p = .035) at low frequency (1 rad/s), and no significant difference at high frequency (G* or tanδ at 100 rad/s). Mucociliary clearance predicted from rheology \((MCI = 1.62 - (0.22 \times \log G* - 0.77 \times \tan\delta))\) was increased to near significance (p = .063). The cohesiveness of sputum was decreased significantly (p = .047).

**CONCLUSION:** This short term treatment on COPD patients demonstrates that that RC-Cornet® decreases the cohesiveness of COPD sputum and improves mucus clearability at low frequency. Since this device is inexpensive, portable, and can be used conveniently by patients in any position, we suggest further long term clinical studies should be carried out.