116. New insights in the physical assessment and therapy of respiratory patients

P1182

Comparison of incentive spirometers on thoracoabdominal mechanics and inspiratory muscular activity in elderly

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The aging process is characterized by physiological and functional modifications which impair the pulmonary function. Incentive spirometry (IS) has been widely used in clinical practice for lung expansion; however, the effect of volumetric (VIS) and flow-oriented IS (FIS) on thoracoabdominal mechanics and respiratory muscular activity in healthy elderly is poorly known.

Objective: To compare the effect of VIS and FIS in the pulmonary ventilation and thoracoabdominal synchrony as well as in inspiratory muscular activity in healthy elderlies.

Methods: Sixteen healthy elderlies (9 females, 71±4yrs, BMI=24±2kg/m^2) performed VIS and FIS (randomized sequence). Chest wall kinematics (optoelectronic plethysmography) and respiratory muscular activity (surface electromyography) was evaluated simultaneously. Synchrony between upper ribcage and abdominal motion was calculated (phase angle). All measurements were evaluated during quiet and deep breathing. One way repeated measures ANOVA with post hoc Newman Keuls test were used and significance level was set at 5%.

Results: No change was observed between the use of VIS and FIS in total pulmonary volume (respectively, 1.4±0.7 vs 1.2±0.6L; p>0.05) and inspiratory muscular activity for sternocleidomastoid and upper intercostal (respectively, 34±25 vs 49±24 10^{-3}mV and 16±10 vs 19±10 10^{-3}mV; p>0.05). However, thoracoabdominal asynchrony was observed during use of FIS compared to VIS (respectively, 18±15 vs 11±8 in the phase angle; p<0.001).

Conclusion: Although volumetric and flow incentive spirometers induce similar increase in lung volumes and inspiratory muscular activity in healthy elderlies, FIS promotes thoracoabdominal asynchrony.

P1183

Comparison of incentive spirometers on thoracoabdominal mechanics and inspiratory muscular activation in morbidly obese

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Morbid obesity causes restriction on chest wall and increases work of breathing. Incentive spirometry has been widely used in clinical practice for lung expansion; however, the effect of volumetric (VIS) and flow-oriented IS (FIS) on thoracoabdominal mechanics and respiratory muscular activity in morbidly obese are poorly known.

Objectives: To compare the distribution of pulmonary volumes and inspiratory muscular activity during use of VIS and FIS in morbidly obese.

Methods: Thoracoadominal mechanics (optoeletronic plethysmography) was evaluated in 17 morbidly obese (43±11yrs, BMI=45±5kg/m^2) simultaneously with respiratory muscular activity (electromyography) during quiet and deep breathes either using VIS or FIS (randomized sequence). Lung volume was evaluated in total chest wall (CW) and its compartments: abdominal (ABD) and upper (URC) and lower (LRC) ribcage. Muscular activity was evaluated in the sternocleidomastoid (SCM), upper (UIC) and lower intercostal (LIC) muscles. One way repeated measures ANOVA with post hoc Newman Keuls test were used and significance level was set at 5%.

Results: A greater chest wall volume was achieved using VIS compared with FIS (respectively, 1.98±0.7L vs 1.62±0.5L; p=0.02); however no difference was observed in all inspiratory evaluated muscles (SCM=21±19 vs 28±23 10^{-3}mV; UIC=9±5 vs 12±12 10^{-3}mV; LIC=6±2 vs 6±3 10^{-3}mV; p>0.05). Furthermore, thoracoabdominal asynchrony was observed during use of FIS (phase angle= 37±38 vs 31±36; p<0.001) compared to VIS.

Conclusions: VIS induces greater chest wall volume with lower thoracoabdominal asynchrony in morbidly obese; however, without difference in the inspiratory muscular activity.

P1184

Chest wall motion supine and sitting positions in patients with amyotrophic lateral sclerosis

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Respiratory muscle function is progressively altered in patients with Amyotrophic Lateral Sclerosis (ALS) leading to chronic respiratory failure. Moreover, diaphragmatic dysfunction starts to occur in supine position in neuromuscular diseases. Studies that analyze the chest wall motion, with special attention to the contribution of the diaphragm, may contribute significantly to earlier detection of ventilation failure.

Aim: Analyze chest wall motion in supine and sitting positions in patients with ALS and in a sex and age-matched healthy control group.

Method: Ten patients with ALS, aged 54±13 years and 10 healthy controls were included. Motion and volume changes of the chest wall and its compartments: rib cage (inspiratory and expiratory muscles) and abdomen (diaphragm and abdominal muscles) were assessed by the optoelectronic plethysmography (OEP, BTS, Milan, Italy).

All participants were evaluated in supine and sitting positions during five minutes of quite breathing in each position. Paired t-tests and independent Student t-tests were used, respectively, for intra-group and inter-group analyses. The significance level was set at $\alpha<0.05$ for all comparisons.

Results: For both groups, the contribution of the rib cage compartment was significantly lower and the abdominal compartment contribution was greater in the supine compared with the sitting position; lower percentages of contribution of the abdominal compartment were observed in the supine position for the ALS group, when compared with controls.

Conclusion: The findings suggested that OEP proved to be a useful tool to identify significant decreases of the diaphragmatic movements in patients with ALS.

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P1185

Laryngeal response patterns in amyotrophic lateral sclerosis during mechanical insufflation-exsufflation

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Introduction: Mechanical insufflation-exsufflation (MI-E) is the most effective approach to increase peak cough airflow in patients with neuromuscular diseases, thereby potentially augmenting airway clearance. Co-ordinated movements of the glottis may be crucial for effect in amyotrophic lateral sclerosis (ALS), but laryngeal response patterns to MI-E have not been studied.

Aims: To visualize laryngeal response patterns to MI-E in ALS patients.

Methods: Continuous videorecorded transnasal fiberoptic laryngoscopy (TFL) was obtained in eight ALS patients (two non-bulbar and six bulbar) during MI-E intervention (Cough Assist®, Respironics, USA), applying pressures of ±20 to ±50 cmH_2O, and instruction to inhale during insufflation and to actively exhale

and cough during exsufflation. Laryngeal movements were assessed from the videorecordings.
Results: In one patient, severe hypopharyngeal obstruction was observed already ±20 cmH_2O. In the remaining patients, hypopharyngeal obstruction was observed during insufflation at 20-40cmH_2O in two and at 50cmH_2O in four patients, during pressure drop from + to - at 20-40 cmH_2O in five, at 50 cmH_2O in six, and during exsufflation in all patients, regardless of pressure. Aryepiglottic folds adducted during insufflation in four patients. The response of the vocal folds could not be observed in five patients due to hypopharyngeal obstruction or severe adduction of aryepiglottic folds.
Conclusion: Larynx can be studied with TFL during MI-E. Marked hypopharyngeal obstruction was observed during exsufflation and during high insufflation pressures. This may obstruct airflow, potentially disrupting positive effects of MI-E.

P1186
Comparison of the impact of laparoscopy and laparotomy on thoracoabdominal mechanics
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Abdominal surgery impairs respiratory system during the postoperative period. Laparoscopies (LPC) and laparotomies (LPT) are the most used surgical procedures; however, there is not enough evidence regarding the differences of both surgeries on the respiratory mechanics.
Objective: To compare the effect of laparoscopy and laparotomy surgeries on thoracoabdominal mechanics.
Methods: This prospective study enrolled 19 consecutive patients, 9 undergoing LPC and 10 LPT (56±9 yrs, BMI=24±4 kg/m^2) that performed chest wall kinematics analysis (optoelectronic plethysmography) before and 2 days after surgery. Patients were evaluated during quiet and deep breathing. Two way repeated measures ANOVA and post hoc Student Newman Keuls test were performed and significance level was set at 5%.
Results: Surgical duration was similar between both groups (LPC=229.4±96 vs. LPT=275.0±104min; $p>0.05$). After LPC and LPT surgeries, patients presented similar decrease in chest wall volume at deep breath (respectively, 1.5±0.3 vs. 1.2±0.4L and 1.6±0.5 vs. 1.1±0.3L; $p>0.05$). However, LPT induced a decrease in ABD volumes and a greater increase in URC and compared to LPC (respectively, URC 48% vs. 39% and ABD 23% vs. 28%; $p<0.001$), after surgery.
Conclusions: Although LPC and LPT promote similar decrease on pulmonary volumes in the postoperative period, LPT induces a greater apical breathing pattern.

P1187
Comparison between maximal inspiratory pressures measured by unidirectional valve method and conventional method in healthy subjects without artificial airway
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The most used method to evaluate maximal inspiratory pressure (MIP) is by maintaining maximum negative pressure forced against an occluded airway (MIPsta). To eliminate the need for collaboration, a new technique was developed using a unidirectional expiratory valve (MIPuni) in patients undergoing invasive mechanical ventilation. The aim of this study was to compare these two methods of measurement in patients with spontaneous breathing without artificial airway. We also tested the intra- and inter-observer reproducibility of MIPuni. The study had a crossover design and twelve healthy volunteers performed the evaluation of MIP of each method in a randomized order. A digital manometer was attached to a mouthpiece (MIPsta) or facemask (MIPuni) and the maximal value in each method was considered. The MIPuni was evaluated by two independent observers (A and B), at two different times (1st and 2nd tests) with an interval of at least one week. MIPuni displayed significantly larger values than MIPsta (106.1±29.3 and 98.4±25.8, respectively; p=0.01). The MIPuni obtained by observer A was not different from that obtained by observer B for both the 1st test (105.9±30.4 and 104.3±26.1, respectively; p=0.32) and the 2nd test (105.5±30.1 and 102.6±31.7, respectively; p=0.24). The MIPuni obtained in the 1st and 2nd tests was not different for both observer A (105.9±30.4 and 105.5±30.1, respectively; p=0.13) and observer B (104.3±26.1 and 102.6±31.7, respectively; p=0,21). MIPuni is the better method for measuring MIP in individuals without artificial airway. The inter- and intra-observer measurements were similar.

P1188
Cardiovascular responses to maximal expiratory pressure and valsalva maneuver in healthy men
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Background/Aim: The respiratory assessment, mainly the measure of maximal expiratory pressure (MEP), has some contraindications because of similarity with the Valsalva maneuver (VM). The objective of this study was evaluated the cardiovascular responses during MEP and identify if this measure reproduces the responses obtained in VM.
Methods: 19 healthy men participated in this study, 11 young (23±3 years) and 8 middle-age (45±3 years), divided in two groups – G1 and G2, respectively. They performed the VM (3x) with 40mmHg of oral pressure during 15s, at the sitting position using different mouthpieces (one with a leak of 2mm and another without). The MEP (5x) was performed from total lung capacity, according ATS/ERS in the same conditions of VM. We analyzed during VM and MEP: the heart rate variation (ΔHR) and systolic and diastolic blood pressure variation (ΔSBP, ΔDBP), and the MEP and Valsalva index (MEPI, VI). ANOVA three-way with Holm-Sidak post-hoc test ($p<0.05$) was employed to analyses de effect of maneuvers, groups and mouthpiece.
Results: We observed that VM have values of ΔSBP (VM: 11±8 mmHg; MEP: 6±6 mmHg), ΔHR (VM: 40±11 bpm; MEP: 22±6 bpm) and indexes (IV: 2.0±0.4; IMEP: 1.5±0.2) were bigger than MEP ($p<0.05$), independent of the group or the mouthpiece. When we analyzed the groups influence we observed that G2 have higher values of ΔSBP and ΔDBP than G1 ($p<0.05$), but not to VI and MEPI (p=0.001). The mouthpiece effect was observed only in ΔDBP (p=0.006) and the piece without leak had the biggest values.
Conclusion: At the studied condition the MEP does not reproduce the cardiovascular responses observed in VM in healthy men.
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P1190

WITHDRAWN

P1191
Cost effectiveness of an ambulatory oxygen (AO) clinic
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Aim: Inappropriate oxygen prescription proves costly to the NHS. There is great need to assess and review patients. We run an AO clinic to assess new patients and review oxygen usage. We assessed the cost effectiveness of this clinic.
Method: Data from a retrospective audit were analysed for all patients who attended clinic from April 2009 to November 2011. AO needs were assessed as per current guidance. Oxygen prescriptions for any mode (LTOT, SBOT, ambulatory) were reviewed to ensure the patient has the correct modality. HOOFs were amended to reflect correct oxygen usage or cancelled if no longer required. Costs of running the clinic were calculated along with actual oxygen savings to evaluate the effectiveness of this clinic (table 1)
Results: Data were available for 251 patients (199 new, 52 reviews). Of the new, 35% (n=70) had a current oxygen prescription. Of these 13% (n=25) did not meet the criteria for the modality prescribed.
Of those for review, 71% (n=37) had received AO when they had undergone pulmonary rehabilitation, the remaining 39% (n=15) had been prescribed oxygen

Savings and Expenditure of AO clinic

	Oxygen savings
New Patients	£29473
Reviews	£17037
Total	£43309
Clinic Costs	£9942

in an earlier clinic but had declined PR. 15 patients were non-concordant, HOOFs were amended to reflect actual oxygen usage.
Conclusion: This clinic is a cost effective way of reviewing patients AO and their other modality needs at the same time.
We currently have 360 respiratory patients' on some form of oxygen but do not have sufficient resources to review them. Moreover, if we were able to conduct these reviews in a more timely fashion, the period of inappropriate prescriptions could be shortened and the cost savings even greater.

P1192
Noninvasive ventilation in emergency: Predictors of success or failure in cases of acute pulmonary edema and the exacerbation COPD
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Background and objectives: The noninvasive ventilation (NIV) has been the technique chosen for cases of acute respiratory failure due to acute pulmonary edema (APE) and exacerbation of Chronic Obstructive Pulmonary Disease (COPD). The objective was to evaluate predictors of success or failure of NIV in an emergency department from Brazil.
Methods: The NIV was used in patients with COPD exacerbation or APE. If no improvement in 2 hours or there is any contraindication to continue with NIV, endotracheal intubation (EI) is performed and considered the endpoint.
Results: The study included 152 patients. On average, the use of NIV was 10 hours for patients with COPD (n = 60) and 7.5 hours for patients with APE (n = 92). It was observed that 75.7% successfully evolved and 24.3% were intubated, and those who progressed unfavorably presented lower oxygen saturation 78.3% compared with those who achieved successfully after NIV, with mean oxygen saturation 84.2%. The findings showed there was a statistically significant difference when researching the APACHE II score and respiratory frequency above 25 in the patients who developed IE. Among patients diagnosed APE, a chance of evolution EI was 63% lower (adjusted OR = 0.37 95% CI: 0,14-0, 96). Similarly, higher values of the Glasgow Coma Score (GCS) and oxygen saturation reduce the chance of adverse developments.
Conclusions: The NIV should be used in emergency services in this cases. Variables like oxygen saturation below 80%, respiratory frequency above 25, higher value of APACHE II and among those who received Bilevel may indicate progression to EI.

P1193
Psychological functioning of patients at earlier grades of COPD
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Chronic Obstructive Pulmonary Disease (COPD) has a major impact on patients' psychological function. Anxiety and depression have been reported in approximately 50% of patients with COPD. However, most of the available data is related to patients at advanced grades. The aim of this study was to assess the presence of anxiety and depression in patients at earlier grades of COPD. A cross-sectional study was carried out with 98 outpatients with COPD (GOLD 1 and GOLD 2) in the central region of Portugal. Socio-demographic and functioning data were collected with a questionnaire based on the International Classification of Functioning, Disability and Health. Spirometry was also performed. Anxiety and depression were evaluated using the Hospital Anxiety and Depression Scale (HADS). Descriptive statistics and χ^2 tests were applied using PASW Statistics version 18.0. Participants mean age was 64.46±12.68 years old and mean FEV_1 % predicted was 75.59±15.88. Approximately half of the sample (n=53; 54.08%) had symptoms of anxiety (HADS-A≥8), 40.82%(n=40) of depression (HADS-D≥8) and 31.63%(n=31) of both. The grade of COPD and gender were not found to be significantly associated with anxiety or depression. However, anxiety was significantly associated with severe dyspnea (p=0.025) and depression with higher difficulties in walking (p=0.001) and higher restrictions in participating in community life (p=0.049). Patients with COPD at earlier grades have high levels of anxiety and depression. Knowledge about the psychological functioning of patients with COPD will inform psycho-education and respiratory physiotherapy interventions, to support patients and improve their adjustment to the disease.

P1194
Muscle function in patients with COPD
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Introduction: Patients with COPD are likely to decrease their level of physical activity due to dyspnea which often results in impaired muscle function. The aim of this study was to make a survey of muscle function in patients with COPD and to relate these findings to health related quality of life.
Methods: One hundred patients with COPD (FEV1% predicted, 43±17, stage II-IV) (59% women) with a mean age of 64±7 years for the women and 67±6 years for the men participated in the study. All patients carried out performance based tests including isometric muscle strength of the quadriceps muscle, hand grip strength, and 30 meter walking test (self chosen and maximal speed). Health related quality of life was assessed with SF-36 and SGRQ.
Results: Muscle strength in the quadriceps muscle reached 85% in patients with COPD in comparison with a reference group of healthy persons. Comparable values for hand grip strength were 90% and walking speed 74-80%. Maximal walking speed correlated with SF-36 (r=0.38, p<0.001) and SGRQ (r=0.36, p=0.001).
Conclusion: Muscle function is generally impaired in patients with COPD, and should be measured in addition to lung function.

P1195
Postural changes in children with non-cystic fibrosis bronchiectasis
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Bronchiectasis not caused by cystic fibrosis (CF) is often perceived to be rare in western societies, but remains an important cause of chronic suppurative lung disease in the developing world among children. Although, the clinical features, radiological, and histological findings in these children was investigated there is not enough knowledge about the musculoskeletal consequences of the disease. Therefore the aim of this study is to document the musculoskeletal affects of the disease process. 24 patients with non-CF bronchiectasis (mean age 13,2(3,4) years) participated in the study. Anterior, posterior and lateral postural analyses was performed and thoracic kyphosis angle was measured from lateral chest X-Rays. 4 (16.7%) patients had kyphosis (over 35 degrees) and mean angle of thoracic curve was 28.5(5.1) degrees. There was scoliosis in 3 (12.5%) of the children. Bilateral pes planus was present in 8 (33.3%) patients. There was barrel chest deformity in 7 (29.2%), pectus carinatum deformity in 2 (8.3%) and pectus excavatum deformity in 4 (16.7%) patients. 17 (70%) patients had also protracted shoulders. Our results indicate a high rate of postural deformities or adaptations especially in the upper body of the patients with non-CF bronchiectasis. Since the upper body posture is carefully related to the pulmonary functions these changes should be closely monitored as soon as the patients are diagnosed and necessary preventive and corrective physiotherapy programs must be initiated.

P1196
Evaluate the autonomic nervous system during the shuttle test (TS) in asthma difficult to control
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Introduction: The autonomic nervous system (ANS) is a primary role in controlling airway caliber and its dysfunction may contribute to the pathogenesis of respiratory diseases.
Objective: To evaluate the autonomic nervous system during the Shuttle Test (TS) in asthma difficult to control.
Method: Twenty patients with asthma (30-52 years) and fifteen healthy subjects (30-52 years) were studied. We conducted the following procedures: controlled walk test (shuttle test) andheart rate variability. Were recorded for 360 seconds during the Shuttle Test. HRV was analyzed in the time domain (TD) (RMSSD index, ie, the root mean square of squares of differences between successive R-Ri records, and the SDNN index, ie the standard deviation of Ri- R ms in normal and in the frequency domain (FD) from the low frequency (LF) and high frequency (HF) in normalized units (NU) and LF/HF ratio.
Results: In DT, the asthma group (GA) had significantly higher values for SDNN and RMSSD) during the Shuttle test, when compared with the control group (CG). In DF, the GC showed significantly higher values of the components of HF and LF and HF components.
Conclusion: It can be concluded that patients with difficult to control asthma showed a reduced HRV compared with healthy during the Shuttle Walk Test with an increase in vagal activity simpatic. Thus, it can be suggested that in future studies, HRV can become a useful tool for parameters in cardiovascular risk stratification in this population, and in the evaluation of different physical therapy interventions to treat these patients.

P1197

Chest expansion in school-age children with mild bronchial asthma

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Introduction: The presence of persistent bronchial asthma (BA) is usually connected with limited chest expansion (CE) [1], but there are no reference values to express if there is a serious limitation.
Aims: To evaluate an effect of a 4-week pulmonary rehabilitation programme (PRP) on CE in school-age children with mild BA.
Methods: One-hundred-and-fourteen children with BA (aged 12.0*m*2.6 years) were examined and recruited for the intervention group (I), which attended a 4-week PRP including respiratory physiotherapy, inhalation, physical activity training in group sessions. Two-hundred-and-eight healthy children (aged 11.9±2.0 years) were examined and assigned to the control group (C). Both groups underwent a CE assessment, which was performed with a tape cloth measure at the level of 4th intercostal space (IC) and at the level of xiphoid process (XP).
Results: CE of the I group was significantly lower at baseline compared to the C group. After the 4-week PRP a significant improvement was achieved that resulted in a presence of not significant difference between the I and C group in almost all subgroups.

CE of BA and healthy children

	CE (cm)	I baseline	C	p (t-test)	I follow-up	C	p (t-test)
Girls	IC	5.4±1.5	6.9±1.7	0.000	6.9±2.0	6.9±1.7	NS
Girls	XP	4.6±2.0	6.4±1.6	0.000	5.8±1.8	6.4±1.6	0.03
Boys	IC	6.0±2.4	7.4±1.7	0.000	7.8±2.3	7.4±1.7	NS
Boys	XP	5.7±2.3	6.5±1.8	0.02	7.1±2.2	6.5±1.8	NS

Conclusion: The PRP led to a significant improvement of chest expansion in BA children, who had CE previously decreased.
Study was supported by grants of the Palacky University – FTK_2011_010; FTK_2012:023.
Reference:
[1] Lopes, E. A. et al. Assessment of muscle shortening and static posture in children with persistent asthma. Eur J Pediatr 2007; 166: 715-721.

P1198

Chest expansion in preschool-age children with mild bronchial asthma

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Introduction: A chronic respiratory disease in adults is often connected with limited chest expansion (CE). We can not find the evidence about CE in preschool-age children at previous published studies and there are no reference values to express if there is a serious limitation.
Aims: To evaluate an effect of a 4-week pulmonary rehabilitation programme (PRP) on CE in preschool-age children with mild bronchial asthma (BA).
Methods: One-hundred-and-three children (aged 5.2*m*0.7 years) with BA were examined and recruited for the intervention group (I), which attended a 4-week PRP including respiratory physiotherapy, inhalation, physical activity training in group sessions. One-hundred-and-sixty-four healthy children (aged 5.2±0.8 years) were examined and assigned to the control group (C). Both groups underwent a CE assessment, which was performed with a tape cloth measure at the level of 4th intercostal space (IC) and at the level of xiphoid process (XP).
Results: Both levels of CE of the I group were significantly lower at baseline compared to the C group. After completing the 4-week PRP a significant improvement was achieved that resulted in a presence of not significant difference between the I and C group in almost all subgroups.

CE of BA and healthy children

	CE (cm)	I baseline	C	p (t-test)	I follow-up	C	p (t-test)
Girls	IC	2.3±0.9	2.9±1.2	0.004	2.9±1.0	2.9±1.2	NS
Girls	XP	2.5±1.5	3.0±1.2	0.02	3.1±1.3	3.0±1.2	NS
Boys	IC	2.5±0.8	3.2±1.3	0.001	2.8±0.9	3.2±1.3	NS
Boys	XP	2.6±0.9	3.6±1.7	0.000	3.0±1.0	3.6±1.7	0.02

Conclusion: The decreased CE constituted a functional disorder in BA children, because the PRP led to a significant improvement and restoration of their CE.
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P1199

Maximal inspiratory and expiratory mouth pressures in children with mild bronchial asthma

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Introduction: Decreased respiratory muscle strength can lead to a higher respiratory effort that reflects on a quality of life in patients with bronchial asthma (BA).
Aim: To compare maximal inspiratory (MIP) and expiratory (MEP) mouth pressures in healthy children and children with BA undergoing a pulmonary rehabilitation programme (PRP).
Methods: The examined group (E) consisted of 108 children with mild BA (aged 11.9±2.6 years), who underwent a 4-week PRP which included respiratory physiotherapy and physical activity training. The MIP and MEP assessment was performed at the baseline and after the PRP. The control group (C) consisted of 208 healthy children (aged 11.9±2.0 years) without any treatment.
Results: The MIP and MEP values of BA children were about the same or lower than those of C group at the beginning of the PRP, but there were no significant differences among the groups (Table 1). A significant improvement of MIP and MEP was observed in BA children after the PRP (Table 2) and furthermore the MIP and MEP values were higher than values in C group (Table 1).

Table 1

	Mouth pressure (cmH2O)	E baseline	C	p (t-test)	E follow-up	C	p (t-test)
Girls	MIP	58.3±23.9	58.2±21.7	NS	71.2±24.9	58.2±21.7	0.0005
	MEP	64.3±23.3	71.4±24.4	NS	78.7±25.6	71.4±24.4	NS
Boys	MIP	76.5±29.5	74.6±2+.3	NS	89.1±28.6	74.6±2+.3	0.0005
	MEP	90.0±33.6	89.4±23.9	NS	104.3±33.7	89.4±23.9	0.002

Table 2

	Mouth pressure (cmH2O)	E baseline	E follow-up	p (t-test)
Girls	MIP	58.3±23.9	6.9±1.7	0.000
	MEP	64.3±23.3	6.4±1.6	0.000
Boys	MIP	76.5±29.5	7.4±1.7	0.000
	MEP	90.0±33.6	6.5±1.8	0.000

Conclusion: The MIP and MEP values in children with mild BA are not significantly lower than values of healthy children.
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P1200

In vitro comparison of emitted dose with 2 types of nebulizers during non invasive ventilation

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Introduction: Non invasive ventilation (NIV) and inhaled therapy are important components of the medical management of COPD patients. Sometimes, both therapies need to be administered simultaneously. It has been shown that it is feasible and effective to deliver nebulized bronchodilatators during NIV.
Objectives: Primary objective was to compare emitted dose (ED) of different types of nebulizers coupled with a single limb circuit bilevel ventilator. Secondary objective was to evaluate the impact of the position of nebulizers on the circuit.
Material and methods: Amikacin (500mg in 4 mL) was nebulized by two vibrating mesh nebulizers (Aeroneb®Pro and Aeroneb® Solo, Aerogen, Ireland) and by a classical jet nebulizer (SideStream; Medic-Aid; UK). The nebulizers were connected to a single limb circuit ventilator (Trilogy® 100, Philips-Respironics, USA), either before (Position 1) or after (Position 2) the passive exhalation port (Whisper Swivel II® Philips-Respironics, USA). The bilevel ventilator was set in spontaneous mode and connected to a lung model to mimic a COPD patient breathing (RR of 16 breaths/minute, I/E ratio of 1:3 and VT of 400 mL). A filter was interposed between the lung model and the circuit. ED was measured by the residual gravimetric method.
Results:

Emitted dose by nebulizer at each position

	Aeroneb®Pro	Aeroneb®Solo	Jet nebulizer	p
Position 1	98.7±4µg	113.1±10µg	76.8±8µg	0.004
Position 2	309±18µg	343.3±30µg	96.8±5µg	<0.0001
p	<0.0001	0.0001	<0.05	

Mean±SD.

Conclusion: Associated with a single limb circuit bilevel ventilator, emitted dose of vibrating mesh nebulizers are greater than jet nebulizer. Moreover to place the nebulizer after the passive exhalation port is optimal for all the devices.

P1201

An initial investigation by electronic survey of current UK physiotherapy practice into the use and delivery of nebulised isotonic saline

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Introduction: Physiotherapy is used widely to assist with airway clearance. Nebulised isotonic saline (0.9%) as a method of enhancing airway clearance has become a clinically accepted adjunct to physiotherapy in the treatment of many chronic lung conditions but it has little scientific evidence on which to base its use.
Aim: To explore the current UK physiotherapy practice regarding the use and delivery of nebulised isotonic saline.
Sample and Methods: This pilot study made use of a prospective mixed methods survey. A questionnaire was designed, validated and administered electronically to a convenience sample of UK respiratory physiotherapists who were of members of the Association of Chartered Physiotherapists in Respiratory Care (ACPRC). Steps were taken to promote reliability and validity of findings and results were analysed using a combination of descriptive and inferential statistics.
Results: The majority of participants (90.3%) agreed that nebulised isotonic saline aids sputum clearance, however no participants thought that there was a strong evidence base. It was noted that there were deviations from the manufacturers guidelines for the use of nebulisers. In addition, findings illuminated that large variations of flow rates for the driving gas used to operate the nebuliser ranging from 5l/min to 15l/min.
Conclusions: Although a pilot, this study highlights the need for more training on the delivery and prescription of nebulised isotonic saline for respiratory physiotherapists. It also highlights the need for more research into the clinical applications of nebulised isotonic saline as an adjunct to physiotherapy treatment.