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119. Asthma: issues in rehabilitation and physical therapy

P1294

Late-breaking abstract: Determination of the endurance capacity on resistance exercise – Physiological responses during load-duration relationship

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Resistance exercise (RE) has been strongly encouraged, providing a favorable effect on muscular strength and endurance, cardiovascular function, metabolism and cardiovascular risk reduction. However, little is known about cardiovascular, ventilatory and metabolic adjustments in the critical load (CL), which would define the transition of moderate exercise for intense exercise. So, the objectives of the study were to: 1) determine the existence and intensity of critical load (CL) during RE, 2) determine the execution time of CL, and 3) evaluate the behavior of cardiovascular, respiratory and metabolic responses during RE at different intensities and at the CL. Fifteen healthy young men (23±2.5 years) carried out 1 repetition maximum (1RM) on the RE at different percentages of 1RM (60%, 75% and 90% 1RM) in order to obtain CL by linear regression: load X reverse of time until fatigue (Tlim). Heart rate (HR), blood lactate ([La]), metabolic and ventilatory parameters were measured all resistance loads. The execution time and number of repetitions was different amongst the resistance intensities ($p < 0.001$). All exercises intensities significantly increased ($p < 0.001$): HR, systolic blood pressure (SBP) ($p < 0.001$) and [La] when compared to both rest and recovery. [La] corrected by Tlim was significantly higher during maneuvers at a greater resistance ($p < 0.0001$). However, metabolic and ventilatory measurements were significantly higher in light loads until fatigue ($p < 0.05$). Lastly, the CL during RE was approximately 54% 1RM. In our study we characterize CL as the exercise intensity that shows peak values of 83% VO₂max and 90% HRmax.

P1295

Late-breaking abstract: Evaluation and comparison of functional capacity to incremental shuttle walk test and maximal exercising test on treadmill in obese women

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The Incremental Shuttle Walk Test (ISWT) has been increasingly used and may constitute a method for assessing functional capacity in obese population. However, if ISWT represents maximal exercise effort and produces similar cardiorespiratory responses in obese women remains to be investigated. The aims was compare the cardiorespiratory responses between obese and eutrophic during the ISWT and the cardiopulmonary exercise testing (CPET). Twenty-nine women (17 obese), allocated in the obese group (OG) and eutrophic group (EG), performed two ISWT and a CPET on a treadmill (Bruce protocol). Heart rate (HR) was determined before and after each test. Ventilatory (VE) and metabolic (VO₂; VCO₂) measurements were collected breath by breath with a portable ergospirometer (Oxycon mobile; CareFusion-Germany). We considered the results of the second ISWT to statistical analysis. Oxygen uptake (ml/kg/min) as well as distance walked and time of the test were significantly lower in the OG in both tests (ISWT:

$p < 0.001$, < 0.001 , < 0.001 ; CPET: $p < 0.001$, $= 0.016$, $= 0.001$; respectively). Both tests showed correlation between distance and VO₂ (ml/kg/min) and HR (ISWT: $r = 0.83$, $r = 0.68$; CPET: $r = 0.53$, $r = 0.52$, respectively). Comparing the methods the ISWT was able to elicit ventilatory, metabolic and cardiovascular responses in agreement with CPET. In addition, it was observed the agreement of both tests to identify relative VO₂, VE and HR at the peak of exercise. The ISWT seemed to be an adequate method to assess functional limitation in obese women and promote ventilatory, metabolic and cardiopulmonary responses in agreement to the CPET.

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P1296

Level of agreement between five asthma control questionnaires

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Introduction: The Global Initiative for Asthma (GINA) guideline outlines the importance of a total control of asthma. This control is assessed by questionnaires evaluating symptoms, reliever use and functional results. We have assessed 5 different questionnaires and evaluated the degree of agreement between them.

Methods: Successive asthma patients with a more than 3 months diagnosis were recruited at our out-patient clinic. They were asked to complete consecutively 5 asthma control questionnaires (GINA, ACQ, ACT, ATAQ, RCP) in a random order. Spirometry and exhaled nitric oxide were also measured. The GINA score was considered as the reference test and compared to the four others using the kappa statistic. For comparison with the ACT and RCP questionnaire, the "partly controlled" level GINA questionnaire was considered as "uncontrolled".

Results: Eighty patients (1.61 female for 1 male) aged 41.8±16.7 years-old were recruited between June and December 2010. The GINA questionnaire results agreed with the ACQ in 62.5% of cases (controlled 22.5%, partly controlled 12.5%, uncontrolled 27.5% - kappa 0.44, $p < 0.001$), with the ACT in 62.5% of cases (controlled 25.0%, uncontrolled 47.5% - kappa 0.46, $p < 0.001$), with the ATAQ in 45.1% of cases (controlled 26.3%, partly controlled 17.5%, uncontrolled 18.8% - kappa 0.45, $p < 0.001$), and with the RCP in 81.3% of cases (controlled 18.8%, uncontrolled 62.5% - kappa 0.54, $p < 0.001$).

Conclusion: Despite the fact that most of these questionnaires have been validated, the agreement between them was moderate. The shortest questionnaire (RCP) showed the highest level of agreement with GINA.

P1297

Factors associated with asthma control in patients with stable asthma

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Introduction: Despite the Global Initiative for Asthma (GINA) guidelines for asthma management, the prevalence of uncontrolled asthma in Greece remains high and factors associated with asthma control unknown.

Aim: To predict associated factors with asthma control in stable asthma

Methods: 100 Greek patients with stable asthma were included in the study and classified as having controlled (≥ 20) or uncontrolled (≤ 19) asthma by the Asthma Control Test-ACT cut-off points. Multiple logistic regression analysis was conducted to identify possible predictors of asthma control. All analyses were conducted with SAS statistical software, version 9.1.

Results: Among study participants, those who had follow-up visits solely in emergency were at excess risk of having uncontrolled asthma (OR=3.79; 95% CI=1.21-11.91; $p = 0.02$). Patients with higher levels of MRC were more likely to have their asthma uncontrolled (OR=3.47; 95% CI=1.31-9.17; $p = 0.01$). A statistically significant inverse association between FEV₁ and asthma control was observed ($p = 0.005$), indicating that 10 units increase in FEV₁ seems to decrease the likelihood of not controlled asthma by almost 50%. Lastly, no evidence of significant associations with asthma control and physical activity ($p = 0.47$), age ($p = 0.53$), gender ($p = 0.25$), BMI ($p = 0.60$), was noted.

Discussion: Greek patients with stable asthma should have regular follow-up visits in order to improve dyspnea and pulmonary function and achieve adequate control and management of asthma.

P1298

Physical, social, and psychological function in asthma patients with and without analgesic tolerance

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Purpose: Ingestion of aspirin and similar drugs triggers severe bronchospasm in some asthmatic patients. The purpose of this study was to compare physical, social

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and psychological function between analgesic intolerant and tolerant asthmatic (AIA and ATA, respectively) patients.

Methods: Twenty-seven AIA and 29 ATA patients participated in this study. Respiratory and quadriceps muscle strength (QMS) were measured. Asthma Control Questionnaire and Asthma Knowledge Test were applied. Six-minute walk test was performed, and physical activity level was determined using International Physical Activity Questionnaire (IPAQ). Dyspnea and fatigue perception was evaluated using modified Medical Research Council dyspnea scale and Fatigue Severity Scale, respectively. Psychological function was evaluated using Beck Depression Inventory and State Trait Anxiety Inventory. General and disease specific quality of life were determined using Nottingham Health Profile and Asthma Quality of Life Questionnaire, respectively.

Results: The FEV₁, QMS, IPAQ walking score, and Asthma Knowledge Test score were significantly higher in AIA patients as compared to those of ATA patients (p<0.05). No significant differences were found in asthma control, respiratory muscle strength, symptom perception, six-minute walk test distance, psychological function, and quality of life between the two groups (p>0.05).

Conclusion: The AIA patients share similar characteristics with ATA patients except better airway function, peripheral muscle strength and physical activity level, and worse asthma knowledge. Presence of analgesic intolerance effects components of physical function in asthma.

P1299

Study of heart rate autonomic modulation in patients with asthma disease

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Background: Evaluate the autonomic activity of patients with asthma in moderate supine and sitting positions.

Material/Methods: Twenty individuals with asthma and 10 healthy individuals were studied. Heart rate and electrocardiographic R-R intervals (iR-R) were recorded for 360 seconds in the supine and seated positions. Heart rate variability was analyzed in the time domain (TD) (RMSSD index, ie, the root mean square of the squares of the differences between successive iR-R records; and the SDNN index, ie, the mean standard deviation of normal iR-R in ms) and in the frequency domain (FD), from the low-frequency (LF) and high-frequency (HF) bands in absolute units (au) and normalized units (nu), and the LF/HF ratio.

Results: In TD, the asthma group (AG) presented significantly higher values for the RMSSD and the SDNN in the seated position, compared with the control group (CG). In FD, the AG presented significantly higher values for HF components, in the supine position, and for LF components, and HF in the seated position.

Conclusions: Patients with asthma present reduced HRV when compared with healthy sex- and age-matched controls, with the reduction in sympathetic and vagal activity. Furthermore, both patients and healthy individuals with asthma do not present autonomic adjustments with front postural change. Future studies should examine the HRV as a useful tool to obtain parameters for the stratification of cardiovascular risk in this population, and in the evaluation of different physical therapy interventions designed to treat these patients.

P1300

The health-related quality of life of asthmatic patients according to the illness severity

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Aim: To evaluate the differences in the Health Related Quality of Life (HRQoL) of Asthmatic patients according to the illness severity using the Saint George Respiratory Questionnaire (SGRQ), an specific instrument for respiratory diseases.

Methods: A cross-sectional, descriptive and observational study with 103 outpatients with Asthma (65 women and 38 men) with mean age of 58.48 years (SD 18.30 years) recruited from the Respiratory Service of the University Hospital of Salamanca, Spain from January to July 2010. Socio-demographic and spirometric data (American Thoracic Society criteria) were collected. The HRQoL was evaluated by the SGRQ. Descriptive analysis, one-way analysis of variance and the t-student test were applied using SPSS.

Results: It was found that 30.1% had Intermittent (I), 35% had Mild Persistent (MP), 25.2% had Moderate Persistent (MOP) and 9.7% had Severe Persistent (SP) asthma according to the Global Initiative Asthma. The mean of the domains were: Symptoms 39.93 scores (SD 21.83 scores), Activity 43.50 scores (SD 28.10 scores), Impact 24.61 scores (SD 17.81 scores) and the Total 32.84 scores (SD 19.07 scores). There were significant differences (ANOVA) between the groups of severity and the forced expiratory volume in 1s (FEV₁), the Vital Capacity (VC) and all domains and the Total SGRQ. There were no significance in the FEV₁ and the VC between I and MP groups (t-student tests). Also there was no significance between the three contrasts between the MP, MOP and MS groups in all domains and in the total SGRQ.

Conclusions: The HRQoL is related to the asthma severity in this studied sample due to higher differences between the Intermittent Asthma and the other groups.

P1301

Evaluation of lung function and deposition in the nebulization carried by heliox associated with positive end expiratory pressure in stable asthmatics: Clinical trial

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Introduction: The combination of positive end-expiratory pressure (PEEP) and heliox is an alternative to optimize aerosol.

Background: Assess the influence of nebulization with bronchodilators adduced by heliox associated with PEEP in lung function and deposition radioaerosol in stable asthmatics during.

Methods: Randomized controlled trial double-blind study involving 32 patients (mean age 47±10 years) divided into four groups: G1: Heliox PEEP + G2: Oxygen + PEEP, G3: Heliox, and G4: Oxygen-submitted to inhalation lung scintigraphy with bronchodilators. Spirometry and cardiopulmonary parameters were evaluated before and after intervention. The deposition index (DPI) was obtained by the ratio of counts in each region of interest (ROI) by the total counts of the right lung and inspiratory capacity (IC) regional obtained by multiplying the total by IC. Statistical analysis used Fisher's tests, Kruskal-Wallis, Mann-Whitney, Wilcoxon and ANOVA considering p <0.05.

Results: Results Post-intervention, the G1 had increased values of predicted FEV₁ (p=0.029) and IC (p=0.004). In reviewing the DPI the groups, there was a higher DPI in the middle third (44±3%, p = 0.001) and intermediate region (40±2%, p <0.01). In assessing the DPI between groups, no difference. The IC was higher in regional G1 and G2 (p <0.05).

Conclusion: The nebulized bronchodilators and heliox combined with PEEP improved lung function. The deposition of drugs was higher in the middle third and intermediate portion of the lungs in all groups. In evaluating the IC regional groups associated with PEEP showed higher values independent of the gas used.

P1302

Effects of nebulization with heliox coupled with positive end-expiratory pressure on the regional chest wall volume variations: A clinical trial

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Positive end-expiratory pressure (PEEP) and heliox are used separately to optimize the nebulization in asthmatics patients. We evaluated the efficacy of nebulizer bronchodilators carried by the heliox coupled to PEEP, at the same time, in the distribution of volume variations into the different thoracoabdominal compartments and to correlate them with pulmonary function in stable asthmatic. Randomized controlled trial study involving 27 patients (mean age 46.52±11.67 years) divided into four groups: G1= Heliox PEEP, G2=Oxygen + PEEP, G3=Heliox, and G4=Oxygen-submitted to nebulization with bronchodilators. Spirometry, cardiopulmonary and chest wall volume by Opto-Electronic Plethysmography (OEP) parameters were measured before and after nebulization. For the OEP, 89 markers were attached to the trunk in a sitting position and three measures of slow vital capacity and quiet breathing were captured by six cameras. Statistical analysis used Fisher's tests, Kruskal-Wallis, Mann-Whitney and Wilcoxon. Post-intervention, regarding to FEV₁/FVC ratio, the G1 had increased values when compared to G3 (p=0.02) and G4 compared to G3 (p=0.02). None difference was found in the regional chest wall volume variations between groups and within groups in the initial and end expiratory volume. IC increased in the G1 (0.09L) and G2 (0.08L) when compared to G3 (0.06L) and G4 (0.06L), p<0.05. There was a correlation between the change in FEV₁ and end expiratory abdominal volume (r=-0.411, p=0.033). In conclusion, nebulization coupled to PEEP can improve the IC in stable asthmatic patients and pulmonary function without changes the regional chest wall volumes.

P1303

Respiratory movements, chest mobility and sensitivity to pain in patients with sensory hyper reactivity (SHR) asthma and COPD

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Introduction: SHR is characterized of airway symptoms induced by chemicals, scents, cold air and exercise; it affects more than 6% of the Swedish adult population. The symptoms including chest tightness, difficulties to breathe and cough are suggestive for asthma but asthma-tests are negative and asthma medication has no effect.

Aim: To study SHR patients' respiratory movements, chest mobility, and sensitivity to pain in comparison to patients with asthma, COPD and healthy controls.

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Methods: 37 patients with SHR, 32 with asthma, 19 with COPD and 28 controls were included. Chest expansion was measured with a measuring tape, thoracic and abdominal movements were measured with the respiratory movement-measuring instrument (RMMI). Pressure pain threshold (PPT) was assessed at five bilateral points.

Results: The Kruskal Wallis test showed that the groups differed significantly on the subject of lung function, respiratory rate and PPT but also regarding chest expansion and abdominal movements at quiet and deep breathing. Analyzed with the Mann-Whitney U-test the SHR, asthma and COPD patients had decreased PPT compared to the healthy controls. Compared to the controls and the asthma group the SHR patients had reduced abdominal and thoracic movements. In the COPD group, but not among the asthmatics, abdominal and thoracic movements were reduced compared to the controls.

Conclusion: In SHR respiratory movements and chest mobility are impaired and the patients appeared to have most similarities with the COPD group where 15 out of 19 had severe or very severe COPD. SHR, asthma and COPD patients had all decreased PPT.

P1304

Neurophysiological and functional assessment in patients with difficult asthma control

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Introduction: Asthma usually responds to treatment with inhaled corticosteroids (with or without the addition of long-acting beta agonists or other drugs) and that means no symptoms and normal lung function or as close to normal as possible. Now, when asthma is inadequately controlled despite a therapeutic strategy adapted and tailored to the level of clinical severity, indicated by a specialist and at least six months duration is regarded Difficult Asthma Control (DAC).

Objective: To evaluate the functional and neurophysiological aspects of patients with DAC.

Method: We performed a cross-sectional study in three groups of patients: DACC (making use of oral corticosteroids), DACO (which makes use of omalizumab) and GC (healthy controls of similar age). The evaluation was made by testing six-minute walk, Sit-ups test, static balance with the pressure platform, monosynaptic reflexes (patellar and Achilles) and quadriceps strength of the dominant leg.

Results: Asthmatic patients have reduced functional capacity, seen testing the six minute walk test and sit-ups ($p < 0.05$), and patients who use oral corticosteroids showed a reduction in the strength of the quadriceps compared to control ($p < 0.05$).

P1305

Comprehensive spa treatment in the Czech Republic

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Introduction: Patient with asthma (AB) can receive a comprehensive care treatment in specialized centres (Spa's) in the Czech Republic.

Aim: To evaluate an effect of the comprehensive spa treatment (CST) on ventilatory parameters, chest mobility and posture in children with AB.

Methods: The examined group consisted of 50 medically stable children with AB (aged 11.6 ± 2.5 years) who underwent a 4-week treatment in the Luhacovice Spa. The assessment was performed at baseline and after the treatment and it included lung function tests, maximal inspiratory (MIP) and expiratory (MEP) mouth pressure examination, chest expansion (CE) and kinesiological examination (muscle strength and length). The CST included respiratory physiotherapy, postural exercise and regular physical activity.

Results: Lung function tests showed normal values at the baseline and after treatment. A significant improvement was observed in all ventilatory parameters, respiratory muscle strength and CE at both levels. There was a lower presence of muscle imbalances (shortened and weakened muscles) after the treatment.

	Baseline (mean, SD)	After 4-week (mean, SD)	p value
VC (% predicted)	90.9±15.4	97.3±9.3	$p < 0.01$
FEV1 (% predicted)	97.4±16.4	104.2±10.9	$p < 0.01$
PEF (% predicted)	86.4±19.2	97.1±16.5	$p < 0.01$
MEF25 (% predicted)	103.5±21.8	117.6±37	$p < 0.05$
MEF50 (% predicted)	90.3±18.9	100.9±20.3	$p < 0.01$
MEF75 (% predicted)	80±27.4	97.6±15.8	$p < 0.01$
MEP (cm H2O)	63.9±27.5	73.9±28.5	$p < 0.01$
MIP (cm H2O)	72.7±30.1	83.9±30.1	$p < 0.01$
CE at the 4th intercostal	5.6±2.1	8±2.1	$p < 0.01$
CE at xiphoid process	4.9±2.1	6.8±1.8	$p < 0.01$

Conclusion: Children with AB can benefit due to the combination of physiotherapeutic approaches and physical activity not only in ventilation and breathing mechanism, but also in improved posture.

P1306

State of the respiratory physiotherapy in Spain: Map from online survey results

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Objective: To define the map of respiratory physiotherapy (RP) in Spain.

Design: Online questionnaire.

Setting: A 39 items online survey was allocated in a survey web during 4 months. Direct contacts, professional colleges, physiotherapy services, universities and professional associations were invited to answer once every professional. The survey was about clinical, teaching and research profile questions and even it was posted on a web-side respiratory national society during the same period.

PARTICIPANTS: graduated physiotherapists living and working in Spain.

Results: 818 questionnaires were answered. The answers obtained had a heterogeneous territorial distribution; Galicia, Catalunya and Castilla-la Mancha were the most responder areas. 560 physiotherapists (69%) performed regular RP treatments, 123 (15%) were involved in respiratory research and 137 (17%) in RP teaching at the university or in post-graduate courses. However, RP was not homogeneously established over the country and only 21.5% of the physiotherapists were fully involved in RP. Physiotherapists involved in RP worked in private centres (25.2%) and at public hospitals (20.5%). Only 309 of the total (38%) obtained a RP post-graduate specialisation in respiratory physiotherapy.

Conclusions: The response rate allows to define the professional situation of RP across Spain. Our specialisation is not well established and its distribution is not homogeneous over the country. There is a need to increase the number of RP post-graduate trained professionals and researchers in order to improve the quality of Respiratory Physiotherapy over Spain.

P1307

OSCE as an evaluation method for graduate students in respiratory therapy

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Objective: The aims of this study were to assess the use of OSCE (objective structured clinical evaluation) as a tool to evaluate the abilities of graduate students in respiratory therapy and to verify the internal consistency of this exam.

Methods: Forty seven students were evaluated by two exams: traditional and OSCE. Each question (traditional) or station (OSCE) ranged from 0.0 to 2.0 and the total score of both exams was 10.0. The exams were prepared by independent educators that were blinded to the final grades. Internal consistency of OSCE stations was assessed by four experienced Respiratory Therapists.

Analysis: Internal consistency was tested by Cronbach's Alpha. The relation between scores obtained in both exams was analyzed by Bland Altman and Pearson's test.

Results: The average score of the students' grades ranged from 4.5 to 9.1. The internal consistency of OSCE stations was considered good (0.7). The agreement between exams was estimated and it was observed that they are not comparable. It was also observed a low agreement between both exams ($r = -0.1$; $p = 0.9$; Pearson linear correlation).

Conclusions: Our results showed that OSCE and traditional exams are not related. The OSCE exam had good internal consistency and assessed distinct aspects of traditional exam.

P1308

Management of dysfunctional breathlessness (DYB) – A retrospective service evaluation

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Introduction: DYB has an incidence of about 10% and may pose a diagnostic and therapeutic challenge. We have established a physiotherapist run clinic to manage this condition.

Aim: To evaluate the outcome of a physiotherapist run DYB clinic.

Method: The diagnosis of DYB was made on the basis of exclusion with a normal clinical examination, lung function and echocardiogram, or with symptoms disproportionate to measurements of severity of their respiratory illness. Patients were assessed by the physiotherapist with regard to their breathing pattern and the Nijmegen (Ni) score, with a score over 23 being regarded as diagnostic of DYB. Consecutive patients referred to the clinic over 24 months were reviewed. The following parameters were analysed: underlying respiratory illness, breathing pattern, Ni score (Pre and Post Intervention), HAD scores and the interventional modalities.

Results: 51 patients (males-20) were referred to the clinic in 24 months. The mean age was 60.2 (range, 20-84). 26/51 patients had chronic cardio respiratory illness. 28/51 patients had an abnormal breathing pattern.

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37 patients had a pre intervention Ni score over 23 (mean-29, range, 23-42). Interventions included patient education, cognitive behaviour therapy, breathing exercises and training. Post intervention the Ni score fell below the diagnostic threshold in 29/37 patients (mean reduction-14, range, 3-22). HAD scores was used to assess the degree of mood impairment and there was no linear correlation with the pre intervention Ni score.

Conclusion: A clinically significant improvement in symptoms as measured by the Ni score was achieved in 78% of the patients referred to our DYB clinic. There was poor correlation between HAD score and the Ni score.

P1309**Clinical outcomes of spinal cord stimulation (SCS) to restore cough**

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Background: In spinal cord injury (SCI), paralysis of the expiratory muscles often results in an ineffective cough and consequent inability to effectively clear airway secretions. SCS is an effective method of expiratory muscle activation.

Design: Clinical trial assessing the clinical outcomes and side effects of SCS to restore an effective cough in 12 SCI subjects.

Main outcome measure(s): Ease in raising secretions, requirement for trained caregiver support for secretion management and incidence of acute respiratory tract infections.

Results: Based upon questionnaire responses, the degree of difficulty in raising secretions improved markedly, and the need for alternative methods of secretion removal was virtually eliminated in each subject. Requirement of trained caregiver support over a 2 week period decreased from 18.0±6.8 (baseline) to 3.4±2.0 and 2.6±2.3 and 2.8±2.5 times/week (p<0.05) at 28, 40 and 52 weeks following device implantation, respectively. The incidence of respiratory tract infections fell from 1.6±0.4 to 0.6±0.2 events/subject year (p<0.05). Some subjects experienced mild leg jerks during SCS. There were no instances of bowel or bladder leakage.

Conclusion(s): Restoration of cough via SCS significantly reduces the difficulty in raising secretions, need for caregiver support and incidence of respiratory tract infection. Moreover, this method improves life quality and has the potential to reduce the morbidity and mortality associated with respiratory tract infections in SCI.

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Disclosure: Dr. DiMarco is a Founder of and has a significant financial interest in Synapse BioMedical, Inc, a manufacturer of diaphragm pacing systems.

P1310**P1311****Influence of the loss of weight after bariatric surgery in the respiratory muscle endurance**

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Background: Weight loss induced by bariatric surgery (BS) in morbidity obese has effects on respiratory function, however the relationship between weight loss and respiratory muscle endurance is unknown.

Objective: To study relationship between weight loss and respiratory muscle endurance induced by BS.

Methods: We evaluated anthropometric parameters (waist circumference (WC), hip circumference (HC), waist-hip ration (WHR), neck circumference (NC)) and lung function tests (spirometry and respiratory muscle strength and maximal voluntary ventilation) in 39 patients (29 F), mean age 35.9±10.9 years, without respiratory or heart diseases, before and after gastric bypass, Roux en-Y surgery.

Results: After 10.8±7.7 months of BS we observed a decreasing in the anthropometric values (p<0.05) of weight: 124.8±17.5 to 88.8±14.28 kg, BMI: 47.9±5.6 to 34.3±4.75 kg/m² and NC: 43.5±3.9 to 37.2±2.7 cm. Significantly improvement lung function was observed in FVC: 3.6±0.9 vs 4.0±1.0 l, FEV1: 3±0.7 vs 3.4±0.8 l, FEF25-75%: 3.4±0.8 vs 3.8±0.9 l/s, ERV: 0.35±0.4 to 0.66±0.4 l and MVV: 103.4±22 vs 137.3±29 l/min, all to p<0.001 compared to pre-operative phase. We found an increase of 0.06 l in the FVC and 5.9 l/min in the MVV after BS for each 1 cm of neck circumference decrease. For each 1kg/m² lost after the BS FVC increase 0.03 l and MVV 2.74 l/min.

Conclusion: The loss of weight induced by BS provides an increase in the lung function and the reduction of fat around the neck appear to be more important to increase lung function than BMI.

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P1312**Airway clearance techniques (ACT): A retrospective study in 188 patients, 96 of which with respiratory failure (RF)**

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ACT comprise PEP-Mask and ELTGOL (PE) commonly used in our clinical practice and a recently introduced device, Temporary PEP (T-PEP[®], UNIKO[®]). The aim of this observational retrospective 4 yrs study is to give a first overview on possible effects and specific indications of T-PEP compared with PE. We re-evaluated data from 188 patients (113 males, mean 70±10 yrs) including 96 patients with RF (i.e. in LTOT and/or mechanical ventilation, MV), 97 COPD and 75 COPD and/or bronchiectasis patients, with or without exacerbation consecutively treated with ACT. 55 subjects were treated with T-PEP, 133 with PE. Demographic, clinical and physiological characteristics between ACT groups were similar. Repeated measures analysis of variance were used. After ACT, significant improvements in all physiological measures were found with no difference between groups: p<0.001 for FVC, FEV1, PEF, SaO2, paO2, PaO2/FiO2. Patients on LTOT showed that the need for O2 therapy decreased after ACT in T-PEP group (1.56±1.301 to 1.46±1.101 l/min - FiO2 0.265±0.048 to 0.260±0.041%) whereas increased in PE group (0.99±0.809 to 1.49±1.160 l/min - FiO2 0.242±0.028 to 0.273±0.088% p<0.029). Among patients not on MV, T-PEP-group showed a trend to an increase of PaO2/FiO2 (p=0.078). ACT can improve physiological parameters with no difference between T-PEP and PE. In the T-PEP group, the reduction on needs of O2 therapy in LTOT patients and the trend of an increase of PaO2/FiO2 in patients not in MV seem to indicate that further studies are needed to target differently ACT in patients with RF. Supported in part by MPR, Italy.

P1313**Change in erythrocyte aggregation during phototherapy in patients with COPD**

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Introduction: Aggregation of red blood cells affects the efficiency of blood flow and oxygen delivery to tissues. This determines the importance of studying this parameter in patients with COPD and to seek correction in case of violations.

Aim: To study erythrocyte aggregation in patients with COPD during phototherapy with lamps with ceramic coating.

Methods: We studied 30 patients in stable phase of COPD (22 men and 8 women) aged 39-64 years, divided into 2 equal groups: 1st - after phototherapy for 10 days, 2nd - without phototherapy. Control group - 10 healthy men aged 40-58 years. Phototherapy was held with infrared light from ceramic-coated lamps of series KL, ZB and GI with wavelengths of 2-40 microns. Spontaneous aggregation of erythrocytes of venous blood was quantitatively evaluated by a special system of criteria for microphotographs of aggregates: the 1st group - before and after 10 days of phototherapy, while the 2nd and control groups - once.

Results: In the 1st group before the start of phototherapy erythrocyte aggregation

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was $8,4 \pm 1,99$. After course of phototherapy it declined by 15,1% and amounted to $7,13 \pm 1,19$ ($p < 0,05$). It is by 16,4% less than in the 2nd group, where the index was $8,53 \pm 1,88$. In both groups of COPD (after and without phototherapy), erythrocyte aggregation was higher than in healthy men ($6,5 \pm 1,35$). But after testing the differences between all 3 groups, a statistically significant difference ($p < 0,05$) was detected only between the 2nd and control groups.

Conclusion: Erythrocyte aggregation increases in patients with COPD. During the 10-day course of treatment with infrared light from lamps with ceramic coating this indicator tended to normalize.