01 - EVALUATION OF RESPIRATORY MUSCLE STRENGTH IN COPD PATIENTS IN A HOSPITAL REHABILITATION PROGRAM

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INTRODUCTION

For Belman, "[..]chronic obstructive pulmonary disease is a common cause of hospitalization, disability and death in the present day, the estimated number of individuals with chronic bronchitis and emphysema increases every day." Belman, MJ et .al. (1981), which results in increasing economic costs to public health agencies.

Chronic obstructive pulmonary disease (COPD) is defined as a disease of limiting by obstruction chronic and progressive of airflow,and is associated with an anormal inflammatory process due inhalation of toxic particles or gases mainly by smoking,and after installation is treatable, but irreversible.

COPD patients show varying degrees of dyspnea and deterioration in ability to perform physical exercises in association with cardiovascular and pulmonary function impaired. The peripheral and respiratory muscle weakness present in these individuals represents additional factor in the intolerance to exertion, dyspnea and quality of life (RIBEIRO, KP et.al, 2007). For Lazio, A. (2009), COPD patients have an impaired quality of life, decreased exercise physical tolerance, and loss of respiratory muscle strength. This decrease is due to deficient pulmonary mechanics and chronic obstruction, which causes the displacement of the point of equal pressure for the airways which haven't cartilage, favoring air entrapment, leading to hyperinflation that decrease respiratory drive to great efforts to evolve after the rest. These patients have significant weight loss, respiratory muscle weakness, reduction of strength in upper limbs and evident decrease in quadriceps strength.

COPD is a pathology of major impetus for the development of pulmonary rehabilitation programs (PRP), which aims to optimize the function, relieve symptoms restoring the patient's functional independence through conditioning exercises and muscle strengthening (Moreira MAC et.al. 2003).

The participation in the PRP provides positive results for patients with COPD, such as improvementphysical exercise tolerance, reduced ventilatory demand at submaximal effort, improvementthe work efficiency, reduced dyspnea, improvement in activities of daily living and decreasing periods of hospitalization.

These benefits are well demonstrated in the literature when it comes to conditioning and muscle strengthening exercises for upper limb (UL) and lower limbs (LL). (RIBEIRO, KP et.al. 2007). Considering the deterioration of respiratory muscle strength, the manometer, with the aim is measure in cm/ H2O respiratory strength of the patient, whose views on whether its strength is sufficient to generate adequate pulmonary volumes or even one is able to produce an effective cough. Therefore, the objective of this research was to determine if a protocol physicaltherapy rehabilitation interferes with respiratory muscle strength thisgroup of patients.

METHODS

This study is characterized with uncontrolled clinical trial, which was conducted at São Lucas/FAG Hospital in the city of Cascavel, PR, Brazil in the period June to October 2014.

To participate in this research was defined as inclusion criteria: the minimum age of 35 years and maximum age of 75 years, diagnosis of COPD, score 15 on the Glasgow Coma Scale, using of oxygen therapy or not. Exclusion criteria was established hemodynamic instability, associated pathologies, heart disease, Borg Scale greater than 5 points and disabling musculoskeletal conditions to perform correctly the proposed aerobic protocol.

When filled the inclusion criteria in this study, patients were informed about their participation, contribution and signature a Free and Clarified Consent Term, being granted permission to the researcher on completion the work.

Participated in this study 6 patients, with 5 males and 1 female, where they were subjected for 8 sessions of rehabilitation,according to the following protocol (Table I) protocol.

After hospitalization of patients and being the same are clinicallystabilized, explained to the participants of the research objectives, and after accept of participation was given start to the protocol of aerobic exercise, being realize technique of measurement of respiratory muscle strength by manometer, measures Pimax and Pemax Were performed by means of a manometer with operating range of ± 120 cmH2O of Globalmed®. The manuvacuometria test was performed as described in guidelines for pulmonary functions test of the Brazilian Journal of Pulmonology. Before and after the start of the protocol, measurement of blood pressure was performed with a stethoscope and sphygmomanometers at Premium®, respiratory rate was counted manually with the aid of wristwatch,saturation of peripheral oxygen and heart rate was measured using a pulse oximeter Oxyn® and subjective effort by the Borg Subjective Stress Scale through a table.

After theinitial data collection, held a series of active stretching of the respiratory chain, being supported by 30-second in flexion, extension, rotation and lateral-flexion in the cervical region, and flexion, extension, adduction, abduction in the shoulder.

Subsequent to stretching, started anaerobic exercisesin upper limbs, using the dumbbells of 0.5 kg for female and 1 kg for male and lower limbs using shields for 1 kg for female and 2kg for male and for all individuals calisthenics exercises with monitoring of heart rate and saturation of peripheral oxygen, with the possibility of changing load and repetitions as reported by the patient through the Borg scale.

The exercises had the following sequence of application: in upper limbs, patient in orthostatism and performed flexion/extension of elbow flexion/ extension, adduction/abduction, internal and external rotation of the shoulder. In the lower limbs, patient supine,performed flexion of hip, in lateral decubitus adduction and abduction of hip, in orthostatism extension of hip, in standing extension of knee. How calisthenics exercises was done squat and plantar flexion in orthostatism position, where all performed 2 sets of 10 repetitions, seeking muscular endurance and finally the cycle ergometer Arktus® model clinic, was held for a minimum of 2 minutes and maximum 10 minutes, oxygen was supplied to the patient who showed saturation less than 90% but hasn'tinterrupted exercise.

The end of the last session were all parameters measured in the first session and compared to having conclusion wheter has been improvement in capacity and ventilatory mechanics after the application of the protocol.

Table 1 - Characteristic of the sample

	AGE	HEIGHT	WEIGHT	BMI
Média	66	1,71	71,33	24,54
S.D	6,86	0,07	11,91	3,77

S. D – Standard Deviation, BMI - Body Mass Index

To have an evidence of statistical probability about the protocol, the mean and standard deviation of the data was performed and analyzed using the Student t test for paired data analysis, considering P = <0.05 for statistical significance.

RESULTS

Participated in this study 6 patients, 5 males and 1 female, hemodynamic variables obtained before and after training are shown in Table II.

Table II - Hemodynamic Data

VARIABLE HEMODYNAMIC						
	Systolic	Diastolic	R.R	H. R	Saturation O2	Borg
Mean	13,11	8,92	24,19	105,02	89,84	4,08
S.D	1,13	1,00	4,47	9,64	3,51	1,29

R. R - Respiratory Rate,H. R - Heart Rate

The results obtained in inspiratory muscle strength testing pre and post protocol, are shown in Table 3. In which the statistical result of the inspiratory pressure was p = 0.63 without statistical impact.

Table 3 - Results of Manovacuometry PImax

MANOVACUOMETRY Pimax		
Patint	1°Evaluation	2° Evaluation
1	80	65
2	80	100
3	40	40
4	80	80
5	35	60
6	65	70
Mean	63,33	69,17
S.D	20,90	20,10
P	0,63	

PI max - maximal inspiratory pressure, S.D - standard deviation, P- statistical value.

The results obtained in expiratory pressure test are shown in Table 4, and statistical probability value of p = 0.73, so haven't static relevance.

Table 4 - Results Manovacuometry Pemax

MANOVACUOMETRY Pemax		
Patient	1° Evaluation	2° Evaluation
1	110	110
2	100	110
3	30	40
4	70	90
5	120	120
6	120	120
Mean	91,67	98,33
S.D	35,45	30,61
P	0,73	

Pe Max - Maximum Expiratory Pressure.S.D - standard deviation p - statistical value.

DISCUSSION

Neder, JA et. al (1997); in a pulmonary rehabilitation protocol with 11 patients where he practiced aerobic exercise, found significant improvement only in PI max (p <0.05), the other variables didn't show substantial changes in their mean values. What didn't occur in present study, where none of the variables had a statistical effect and can be considered the treatment time was very variable, as Neder et al took your protocol a lifespan of 24 sessions.

In another protocol pulmonary rehabilitation, Mai, CMG et.al (2012); shows decrease in mean PEmax and a statistical improvement in Pimax after 3 weeks of protocol. In this study, the average PE max also hadn't satisfactory result, therefore consistent with MAI, CMG et.al (2012). Neder et.al. (1997); says in contrast with normal subjects, where the limitation is cardiovascular and /or muscle, pulmonary disease can't exhibit toracopulmonar functional reserve enough to tolerate the metabolic and ventilatory demands associated with moderate/intense activity. Thus, a ventilatory limitation, vascular, pulmonary or gas exchange could appreciably restrict the identification prevalent LA (aerobic linear) and therefore, bearable training load, reducing the possible positive answers in the aerobic sphere. Regarding the statistical improvement of Pimax our study corroborates the results of MAI (2012) which not found statistical significance.

Ribeiro, K.P. et.al (2007), in another pulmonary rehabilitation program with respiratory and aerobic exercises, with 19 patients and having one care a week, total of 12 weeks. Found in maximal respiratory pressures, satisfactory results (p = 0.01) between the pre and post pulmonary rehabilitation. In this study none of the pressures obtained statistical improvement. However, the same study by Ribeiro, K.P. et. al, (2007), with relatively low number of weekly attendance, the patients were offered brochures home exercises and stretches, where they performed two other times in the week.

Moreira, MAC et.al, (2001), in a study with 23 patients in pulmonary rehabilitation protocol with aerobic activities and strengthening of isolated appendicular skeletal muscle in relation to assessment of the TC6, the results showed that evaluated, respiratory rate and peripheral saturation where no significant difference in pre-and post-training at the beginning and the end of TC6. The RR increased significantly at the end of the test after training (p = 0.035). Already in our study, changes of heart rate, respiratory, or even the saturation of peripheral oxygen didn't reach statistical significance, even after the use of aerobic cycle ergometer. Can be considered that the intensity of the training protocol the Moreira et.al. (2001)were established at 60% incremental test, thus requiring more aerobic part the patient.

CONCLUSION

In the study, it was observed there wasn't effective in a pulmonary rehabilitation program in increase the respiratory muscle strength in pulmonary disease patients. Importantly, the data obnainedare shorty treatment and hospital phase. Are necessary most studies on the subject, with a longer intervention and a number of larger sample to better compare data.

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EVALUATION OF RESPIRATORY MUSCLE STRENGTH IN COPD PATIENTS IN A HOSPITAL REHABILITATION PROGRAM

ABSTRACT

Chronic obstructive pulmonary disease (COPD) is a disease characterized by expiratory airflow obstruction, and then installed it is treatable, but irreversible. Participation in pulmonary rehabilitation program provides positive results for patients with COPD, decrease as periods of hospitalization because it improves the efficacy of respiratory and appendicular muscle work. This study is characterized with uncontrolled clinical trial, which was conducted at São Lucas/FAG Hospital of Cascavel PR. Participated in this research, 6 COPD patients, who haveevaluation of respiratory muscle strength and hemodynamic changes pre/post pulmonary rehabilitationprogram. Met clinical improvements, and values of respiratory muscle strength, however not considered statistically significant changes. At the end conclude there wasn't statistical improvement, but the improvement of tabular datapost rehabilitation was visible in the population studied.

KEY WORDS: Chronic Obstructive Pulmonary Disease, Pulmonary Rehabilitation, Hospital Physiotherapy Service.

ÉVALUATION DE RESPIRATOIRE FORCE MUSCULAIRE CHEZ LES PATIENTS ATTEINTS DE MPOC APRES PROGRAMME HÔPITAL DE RÉADAPTATION.

RÉSUMÉ

La maladie pulmonaire obstructive chronique (MPOC) est une maladie caractérisée par une obstruction du flux d'air expiratoire , et ensuite installé, il est possible de traiter , mais irréversible . Participation à un programme de réadaptation pulmonaire offre des résultats positifs pour les patients atteints de BPCO , telles que les périodes d'hospitalisation a diminué pour avoir amélioré l'efficacité du travail des muscles respiratoires et appendice . Cette étude ne sont pas commandées essai clinique , réalisée à l'hôpital São Lucas de Cascavel PR ont participé à cette pesquisa 6 BPCO patients qui avaient l'évaluation de la force des muscles respiratoires et les changements hémodynamiques programme de réhabilitation pré / post pulmonar.Encontrou- si des améliorations cliniques et les valeurs de la force des muscles respiratoires , mais ne sont pas considérés changements statistiquement significatifs . A la fin , nous concluons qu'il n'y a pas d'amélioration statistique , mais l'amélioration après les données sous forme de tableaux de réadaptation était visible dans la population étudiée. .

MOTS-CLÉS:Maladie pulmonaire obstructive chronique , la réadaptation pulmonaire Hôpital service de physiothérapie .

EVALUACIÓN DE LAS VÍAS RESPIRATORIAS FUERZA MUSCULAR EN PACIENTES CON EPOC EN UN PROGRAMA DE REHABILITACIÓN HOSPITALARIA.

RESUMEN

Enfermedad pulmonar obstructiva crónica (EPOC) es una enfermedad caracterizada por la obstrucción del flujo de aire espiratorio , y luego instalado es tratable , pero irreversible. La participación en el programa de rehabilitación pulmonar ofrece resultados positivos para los pacientes con EPOC , tales como la disminución de los períodos de hospitalización por haber mejorado la eficacia del trabajo de los músculos respiratorios y apéndice . Este estudio no es controlado ensayo clínico , realizado en el Hospital São Lucas de Cascavel PR participó en esta EPOC pesquisa 6 pacientes que tuvieron la evaluación de la fuerza muscular respiratoria y alteraciones hemodinámicas programa de rehabilitación pre / post pulmonar.Encontrou- si las mejoras clínicas, y los valores de la fuerza de los músculos respiratorios , pero que no se consideran cambios estadísticamente significativos . Al final llegamos a la conclusión de que no hubo mejoría estadística , pero la mejoría después de los datos tabulados de rehabilitación era visible en la población estudiada .

PALABRAS CLAVE: Enfermedad Pulmonar Obstructiva Crónica , Rehabilitación Pulmonar, Hospital Servicio de Fisioterapia.

AVALIAÇÃO DE FORÇA MUSCULAR RESPIRATÓRIA EM PACIENTE DPOC EM UM PROGRAMA DE REABILITAÇÃO HOSPITALAR.

RESUMO

A doença pulmonar obstrutiva crônica (DPOC) é uma doença caracterizada pela obstrução do fluxo aéreo expiratório, e depois de instalada é tratável, mas irreversível. A participação no programa de reabilitação pulmonar oferece resultados positivos para pacientes com DPOC,como diminuição dos períodos de internação hospitalar por ter melhora na

eficácia do trabalho muscular respiratórios e apendicular. Este estudo trata-se de ensaio clinico não controlado, realizado no Hospital São Lucas da cidade de Cascavel PR Participaram desta pesquisa6 pacientes portadores de DPOC que tiveram a avaliação da força muscular respiratória e variações hemodinâmicas pré/pós um programa de reabilitação pulmonar.Encontrou-se melhora clinica, e dos valores de força muscular respiratória, porém não sendo consideradas alterações estatisticamente significativa. Ao termino concluímos que não houve melhora estatística, porém a melhora dos dados tabulados pós reabilitação foi visível na população estudada.

PALAVRAS-CHAVE: Doença Pulmonar Obstrutiva Crônica, Reabilitação pulmonar, Serviço de Fisioterapia Hospitalar.