71 - ANALYSIS OF PULMONARY FUNCTION IN INDIVIDUALS AMPUTEES TRANSFEMORAL IN PRE-FITTING

PATRÍCIA DUARTE;
CAMILLE CALEFFI;
MARCELO TAGLIETTI
Faculdade Assis Gurgacz- FAG- Cascavel- Paraná- Brasil
patriciaduarte91@gmail.com

INTRODUCTION

According Kisner and Colby (1998), the strength is the ability to have a muscle or muscle group to develop tension and strength resulting in a maximum effort, both dynamic and statistically in relation to claims made to it. Muscle fatigue occurs when the rate of energy consumption rate is greater than the energy given to the muscle. Depletion in energy reserves inner muscle leads to failure of force generation to the onset of fatigue (AZEREDO, 2002).

The measurement of maximal respiratory pressures (MIP and MEP) is the most common procedure to assess the force produced by the respiratory muscles, because it is a simple, sensitive and acceptable reproducibility, resulting in a global strength of respiratory muscles (GARDEN; RATTO; CORSO, 2002).

Individuals presented with respiratory muscle dysfunction, which contributes to exercise intolerance, dyspnea and hypercapnia. Respiratory muscles can improve their function in response to exercise appropriate. The symptoms can be prevented or reduced with a scheme of respiratory muscle training effective. After knowledge of the functioning of the respiratory muscles and the upper and lower limbs, physical therapists can develop the training program most suitable and effective for individuals (FOGIARINI et al, 2007).

Consequently the inertia caused by the amputation the individual becomes unconditioned which reduces their ability to exercise, lowers your tolerance to the efforts etc. The main effects of immobility on the respiratory system are reduced vital capacity, decreased functional residual capacity, decreased forced expiratory volumes, changes in ventilation / perfusion (CELLA, 2011).

The research therefore aimed to identify the deleterious effects of immobility caused by amputation on respiratory function of individuals undergoing fitting through testing using spirometry and manuvacuometria, these tests compatible with cardiorespiratory conditions of individuals analyzed.

DEVELOPMENT

Field study was a descriptive cross-sectional quantitative, non-probabilistic intentional checked the lung function of individuals with lower limb amputation. The population addressed were individuals in pre-fitting, providing assistance in the Rehabilitation Clinic FAG with transfemoral amputation level. Individuals were excluded who had already prostheses, amputation and presenting different selected for the sample. Individuals who did not understand the tests were also excluded. The study was approved by the ethics committee of the IES.

For spirometry was used Microlab 3300 spirometer By Micromédica ® Ltda. It was explained to the subjects, the procedures for testing. All subjects performed at least three forced vital capacity maneuvers. From these maneuvers were obtained numerical values of the following variables: forced vital capacity (FVC), forced expiratory volume in one second (FEV1) and FEV1/FVC. The predicted values were obtained from the reference values for adults described by the Brazilian Thoracic Association (PEREIRA, 2004).

Measures of maximal inspiratory pressure and maximal expiratory pressure were performed by digital manometer brand Microhard MVD 500. For measurement of maximal respiratory pressures subjects were instructed on how the test would be conducted. Were performed three to five maneuvers maximum acceptable and reproducible (10% difference or less between efforts), with an interval of rest between efforts for about 1 minute, and recorded the highest value. We adopted the equation of Neder et al, 1999 for the calculation of predicted values.

RESULTS AND DISCUSSION

The sample was composed of 6 individuals with transfemoral amputation medial, 3 female and 3 male. The age group had a mean age of 63.83 years. Among the subjects studied 60% were normal, and 20% showed moderate restrictive ventilatory defect by analyzing spirometric.

Regarding the maximal respiratory individuals had a mean MIP -80 cm/H20 indicating decreased respiratory muscle strength and Pemax 75 cm/H20 also indicating decreased expiratory muscle strength. The results are shown in Table 1.

Statistical analysis was by descriptive statistics, after normalization of the data by the Shapiro-Wilk, presented as mean and standard deviation. The significance level was 5% and the software used was SPSS version 20.

Table 1 - Mean values and standard deviations of age, weight, spirometry and manometry.

Variables	Average	Standard Deviation
Age	63,83	24,79
Weight (kg)	75,83	25,88
Height (m)	1,72	0,16
Sex (%)	50	50
MIP (cm/H20)	80	27,57
Pemax (cm/H20)	75	30,17
FVC (L / min)	2,62	1,17
FEV1 (L / min)	93	5,37
CVF/VEF1 (L / min)	2,46	1,17
FEF25 (L / min)	1,76	1,04

Legend: Kg: Kilo Grams; m: meters;%: Percent; cm/H20: Inches of water, L / min: Liters per minute.

Amputation often occurs after all attempts possible to save one end affected and must be designed by the individual as the beginning of a new phase, it should be clear that the procedures for amputation of lower limbs is an act of restoring a diseased organ and not a mutilation. (PIRES, S. R., & SANDOVAL, 2010).

Mobility is a key component to an independent life. The implications of amputation affect the individual both physically and psychologically due to the inability of locomotion (FORTINGTON et al, 2012). Immobility (or movement limitations) can change the emotional state of the individual regardless of the condition that led to prolonged recumbency, and may have anxiety, apathy, depression, emotional lability, social isolation and it is possible that with prolonged immobility, a person normal and healthy develop stiffening of the muscles of the spine and limbs, weakness, osteoporosis, changes in morphological, biochemical and biomechanical various components of synovial joints, and cardiovascular deconditioning (BOECHAT, et al, 2012).

It is known that staying in bed for long periods is an important factor to be assessed , it may lead to further damage of a physical nature (eg , pressure ulcers) and psychosocial (isolation and depression) and is now commonly accepted that inactivity can cause diverse effects on multiple organ systems . Initially , immobility produces a reduction of functional capacity of an organ and later affects multiple organs and body systems (cardiovascular system , digestive system , respiratory, excretory , and even the nervous system) . When the functional capacity drops to dangerously low levels , new signs and symptoms appear and may be observadosno Locomotor in the Cardiovascular , Respiratory , Genitourinary , Gastrointestinal and Central Nervous System (BOECHAT , et al , 2012) . These findings are in line with the results of this study , where the subjects had reduced levels of lung function .

The assessment of respiratory muscle strength (RMS) is a method of great importance to respiratory therapy , differing is a conventional muscle testing , therefore, through this evaluation , it is possible to investigate the conditions of strength and mechanical performance of muscles breath. For this purpose, can be performed by palpation and interpreted based on the principles of mechanics of action of these muscles can be evaluated by various other methods. This evaluation may help explain aspects involving both physical conditioning of healthy individuals or athletes , as the diagnosis of respiratory muscle diseases , it is extremely important for individuals with neuromuscular diseases and useful in monitoring progressive diseases like polymyositis , myasthenia gravis and Guilliain - Barré syndrome , and assist in the development of a respiratory muscle training (ONAGA , et al , 2010) .

The findings of decreased respiratory muscle strength plus the age of individuals beyond the effects of immobility may have contributed to the finding of restrictive disorders in 20% of the sample.

The results show that there are differences in the normal values of the individuals tested, where it is possible to verify that these individuals have a deficit of capacity and ventilatory muscle strength as a result of immobility, caused by amputation. Early intervention of therapy in these individuals to assist those consequences are reduced or canceled.

CONCLUSIONS

Through research it can be concluded that the use of spirometry and manometer are highly effective for evaluating ventilatory capacity. According to the results, we found that the sample population has decreased ventilatory capacity and muscle strength that are derived from the consequences of immobility transfemoral amputation.

REFERENCES

AZEREDO, C. A. C. Fisioterapia Respiratória Moderna. 4.ed.; São Paulo: Manole, 2002.

CARVALHO, Mercedes. Fisioterapia respiratória: fundamentos e contribuições. 5.ed.; Revinter, 2001.

COSTA, D. et al. Avaliação da Força Muscular Respiratória e Amplitudes Torácicas e

Abdominais após a RFR em Indivíduos Obesos. Revista Latino-Americana de Enfermagem, Ribeirão Preto, v.11, n.2, p.156-160, mar./abr. 2003.

Disponível em <http://www.scielo.br/pdf/rlae/v11n2/v11n2a03.pdf>. Acesso em 05 de abril de 2013.

FIORE JUNIOR, J.F. et al. Pressões Respiratórias Máximas e Capacidade Vital: comparação entre avaliações através de bocal e de máscara facial. Jornal Brasileiro de Pneumologia, São Paulo, v. 30, n.6, p.515-520, nov./dez. 2004.

Disponível<http://www.scielo.br/scielo.php?pid=S180637132004000600005&script=sci_arttext&tlng=pt>.Acesso em 05 de abril de 2013.

IRWIN, S.;TECKLIN, J. S. Fisioterapia cardiopulmonar. 2ª.ed.; São Paulo: Manole, [s.d]. JARDIM, J. R.; RATTO, O. R.; CORSO, S. D. Função pulmonar. In: TARANTINO, A.B. Doenças pulmonares. 5.ed.; Rio de Janeiro: Guanabara Koogan, 2002

MACHADO, M. G. R. Treinamento muscular respiratório. In: AZEREDO, C.A.C.Fisioterapia respiratória moderna. 4. ed. São Paulo: Manole, 2002.

CELLA, Camila Cristina. Análise da qualidade de vida de indivíduos amputados transfemoral e transtibial com sensação fantasma. FIEP BULLETIN – Volume 81 – Special Edition – ARTICLE II – 2011.

PEREIRA, C.A.C. Testes de função pulmonar. Sociedade Brasileira de Pneumologia Tisiologia, Projeto Diretrizes, 2004.

BOECHAT, Júlio Cezar dos Santos, et al, A Síndrome de Imobilismo e seus efeitos sobre o aparelho locomotor do idoso. Revista Cientifica Internacional, edição 22, volume 1, artigo nº 5. julho/setembro 2012. Disponível em http://www.interscienceplace.org/interscienceplace/article/viewFile/447/293. Acesso no dia 02 de junho de 2013.

FORGIARINI JUNIOR, Luiz Alberto, et al. Avaliação da Força Muscular Respiratória em Indivíduo em Insuficiência Cardíaca. Porto Alegre, RS. Disponível em http://www.scielo.br/pdf/abc/v89n1/07.pdf. Acesso no dia 02 de junho de 2013.

PEREIRA, Carlos Alberto de Castro. Espirometria. Sociedade Brasileira de Pneumologia, outubro de 2002. Disponível em http://www.sbpt.org.br/downloads/temp/bibliografia.pdf. Acesso no dia 04 de junho de 2013.

Rua: Rafael Picoli, nº 2827, bairro Country
Cascavel/PR - Brasil

ANALYSIS OF PULMONARY FUNCTION IN INDIVIDUALS AMPUTEES TRANSFEMORAL IN PRE-FITTING

ABSTRACT

Introduction : As a result of immobility caused by amputation the individual becomes unconditioned which reduces their ability to exercise , lowers your tolerance to effort . Individuals presented with respiratory muscle dysfunction , which contributes to exercise intolerance , dyspnea and hypercapnia . Respiratory muscles can improve their function in response to exercise appropriate. The measurement of maximal respiratory pressures (MIP and MEP) is the most common procedure to assess the force produced by the respiratory muscles , because it is a simple, sensitive and acceptable reproducibility , resulting

in a global strength of the respiratory muscles. Objective : To measure lung function in individuals at levels transfemoral amputees. Methods : The sample consisted of 6 individuals with transfemoral amputation medial , 3 female and 3 male who underwent spirometry tests and manometry . They all signed an informed consent and the project was approved by the IRB of the institution. Results: Among the subjects studied 60% were normal , and 20 % showed moderate restrictive ventilatory defect by analyzing spirometric . Regarding the maximal respiratory individuals had a mean MIP -80 cm/H20 indicating decreased respiratory muscle strength and Pemax 75 cm/H20 also indicating decreased expiratory muscle strength. Conclusions: It was possible to identify the sample population has decreased ventilatory capacity and muscle strength that are derived from the consequences of immobility transfemoral amputation.

KEYWORDS : Amputation . Immobility . Pulmonary Function .

ANALYSE DE LA FONCTION PULMONAIRE CHEZ LES PERSONNES AMPUTÉS TRANSFEMORALES DANS LE PRE-MONTAGE

RESUMÉ

Introduction: En raison de l'immobilité causée par une amputation de l'individu devient inconditionné qui réduit leur capacité d'exercer, abaisse votre tolérance à l'effort. Les personnes présentées à un dysfonctionnement des muscles respiratoires , ce qui contribue à exercer l'intolérance , la dyspnée et l'hypercapnie . Muscles respiratoires peuvent améliorer leur fonction en réponse à l'exercice approprié. La mesure des pressions maximales respiratoires (MIP et MEP) est la procédure la plus courante pour évaluer la force produite par les muscles respiratoires , parce que c'est une reproductibilité simple, sensible et acceptable , résultant en une force globale des muscles respiratoires. Objectif: mesurer la fonction pulmonaire chez les personnes aux niveaux des amputés transfémorales . Méthodes: L' échantillon était composé de 6 personnes avec amputation médiane , 3 femmes et 3 hommes qui ont subi les tests de spirométrie et la manométrie . Ils ont tous signé un consentement éclairé et le projet a été approuvé par l'IRB de l'institution. Résultats: Parmi les sujets étudiés 60% étaient normaux , et 20% ont montré modéré déficit ventilatoire restrictif en analysant spirométriques . En ce qui concerne les individus respiratoires maximaux avaient une MIP moyenne -80 cm/H20 indiquant une diminution de la force musculaire respiratoire et Pemax 75 cm/H20 indiquant aussi diminution de la force des muscles expiratoires . Conclusions : Il a été possible d'identifier l'échantillon de population a diminué la capacité ventilatoire et la force musculaire qui découle des conséquences de l'immobilité amputation .

MOTS-CLÉS: Amputation. Immobilité. Fonction pulmonaire

ANÁLISIS DE LA FUNCIÓN PULMONAR EN INDIVIDUOS AMPUTADOS TRANSFEMORAL EN PRE-GUARNICIÓN

RESUMEN

Introducción : Como resultado de la inmovilidad causada por la amputación del individuo se convierte en no condicionado que reduce su capacidad de ejercer , disminuye su tolerancia al esfuerzo . Las personas que se presentan a la disfunción muscular respiratoria , lo que contribuye a la intolerancia al ejercicio , disnea e hipercapnia . Los músculos respiratorios pueden mejorar su función en respuesta al ejercicio correspondiente. La medición de las presiones respiratorias máxima (PIM y MEP) es el procedimiento más común para evaluar la fuerza producida por los músculos respiratorios , ya que es una reproducibilidad sencillo, sensible y aceptable , lo que resulta en una fuerza mundial de los músculos respiratorios . Objetivo: medir la función pulmonar en las personas a nivel amputados transfemoral . Métodos: La muestra estuvo conformada por 6 personas con amputación transfemoral medial , hembra de 3 y 3 hombres que se sometieron a pruebas de espirometría y manometría . Todos firmaron un consentimiento informado y el proyecto fue aprobado por el IRB de la institución. Resultados: De los sujetos estudiados el 60% eran normales , y el 20% presentaron un moderado defecto ventilatorio restrictivo mediante el análisis de espirometría . En cuanto a las personas respiratorias máximas tuvieron un MIP media -80 cm/H20 indican una disminución en la fuerza muscular respiratoria y Pemax 75 cm/H20 también indican una disminución en la fuerza muscular espiratoria. Conclusiones : Se pudo identificar la población de la muestra se ha reducido la capacidad ventilatoria y la fuerza muscular que se derivan de las consecuencias de la inmovilidad amputación transfemoral .

PALABRAS CLAVE: Amputación. La inmovilidad . Función Pulmonar .

ANÁLISE DA FUNÇÃO PULMONAR EM INDIVÍDUOS AMPUTADOS TRANSFEMORAIS EM FASE DE PRÉ-PROTETIZAÇÃO

RESUMO

Introdução: Por consequência do imobilismo causado pela amputação o indivíduo torna-se descondicionado o que reduz sua capacidade de realizar exercícios, diminui sua tolerância aos esforços. Os indivíduos com comprometimento respiratório apresentaram disfunção muscular, o que contribui para intolerância aos exercícios, dispnéia e hipercapnia. Os músculos respiratórios podem melhorar sua função em resposta ao treinamento físico adequado. A mensuração das pressões respiratórias máximas (PImáx e PEmáx) é o procedimento mais comum para avaliar a força produzida pelos músculos respiratórios, por tratar-se de uma técnica simples, sensível e com reprodutibilidade aceitável, traduzindo de forma global a força dos músculos respiratórios. Objetivo: Mensurar a função pulmonar em indivíduos amputados em níveis transfemurais. Métodos: A amostra foi composta por 6 indivíduos, com amputação transfemoral medial, sendo 3 do sexo feminino e 3 do sexo masculino que realizaram os testes de espirometria e manovacuometria. Os mesmos assinaram o TCLE e o projeto foi aprovado pelo CEP da instituição. Resultados: Dentre os indivíduos analisados 60% apresentaram resultados normais, e 20% apresentaram distúrbio ventilatório restritivo moderado através da análise espirométrica. Em relação as pressões respiratórias máximas os indivíduos apresentaram média de Pimax de -80 cm/H20 indicando diminuição da força muscular respiratória e, Pemax 75 cm/H20 também indicando diminuição da força muscular expiratória. Conclusões: Foi possível identificar que a população da amostra possui uma diminuição das capacidades ventilatórias e da força muscular que são consequências do imobilismo oriundo da amputação transfemoral.

PALAVRAS-CHAVE: Amputação. Imobilismo. Função Pulmonar.