32 - EVALUATION OF MAXIMAL RESPIRATORY PRESSURES WHEELCHAIR PRE AND POST IN BASKETBALL IN WHEELCHAIR ADAPTED

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INTRODUCTION

The sport consists of suitable adaptations and modifications to the rules, materials and places for activities, enabling the participation of people with disabilities. It aims sporting experiences specifically designed or modified to meet the special needs of individuals. It aims to enable the participation of people with special educational needs in sports and activities can be better understood by knowing the history of adapted sports.

In 1944, Mr. Ludwig Guttamann, German neurologist and neurosurgeon believed that the sport had the formula to motivate and lessen the tedium of life of an unemployed disabled, only to discover more. Made to organize the world, showing that all people with a disability could perform physical activities and sports (ROSADAS, 1989).

STROHKENDL (1996) reports that the wheelchair basketball in the United States was created by veterans of World War II in 1945, however there is no written record to confirm this date. The first record we have is from December 6, 1946, when an article was published in an American newspaper commenting on the events in a basketball game on wheels.

In Brazil, according to MATTOS (1994) the emergence of BCR was given by Sergio Del Grande and Robson Sampaio that the return of a rehabilitation program in the United States, brought this method to Sao Paulo and Rio de Janeiro. Depending on the responsiveness of this modality, Robson founded in Rio de Janeiro's Club Optimism and Del Grande founded in Sao Paulo in the Club of Paraplegic July 28, 1958.

According to ALVES (2003), under competitive 70 years from the adapted sport begins to dissociate the therapeutic approach and starts the process of elite sport, so that health professionals, sports training and related areas, to seek new knowledge about the behavior of biological, psychological and social development of people with disabilities to better application of training methods for the development of materials and equipment to maximize the potential functional and sports performance and to assess the psychological and social benefits.

In a study of LEVANDOSKI & CARDOSO (2007) with basketball players in wheelchairs in the city of Florianopolis, the authors report that the athletes in this group are mostly suffering from polio, and that these athletes, when compared to injured spinal cord and amputees, have more difficulty in finding sports activities for social inclusion, alleviation of health problems or physical maintenance.

The number of disabled by spinal cord injury increases every day. RIBAS (1997) shows that this finding is worrisome because it is related to the incidence of social problems such as urban violence, accidents, poverty, population, drug use by young people, social exclusion, among other factors.

The spinal cord is the elongated portion of the central nervous system that connects the brain to the nerves responsible for the conduct of motor and sensory orders. When the cord is injured, eventually stop carrying out the orders, at some level of the spine. The lesions are characterized by inability to move below the level of injury, being divided into complete, when there is total disruption of the spinal cord, or incomplete when it is partially damaged. Can be classified as tetraplegia in the case of cervical lesion, involving the trunk, upper and lower limbs, or paraplegia, affecting the lower limbs and trunk.

The SCI sets a new routine for the affected, and this requires changes and adaptations in the various roles and activities undertaken so far. It is wheelchair to find new ways to get to experience autonomy and independence in their new activities.

The manometer is a simple, convenient and accurate assessment of respiratory muscle strength since the late 60's and 70's, in healthy patients, in patients with respiratory and neurological dysfunction (COSTA et al., 2003). It is considered useful as a means of evaluating the condition of the respiratory muscle strength in patients with spinal cord injury. The Pemax is the highest pressure that can be obtained from the forced respiratory effort against an occluded airway is measured from total lung capacity (TLC) and Pimax is the largest sub-atmospheric pressure from the residual volume (RV), against an occluded airway (ALMEIDA, 2008)

From this analysis suggests that the measurement of maximal respiratory pressure manometer through the spinal cord in early practitioners basketball on wheels.

MATERIALS AND METHODS

The present study is to be cause-effect, longitudinal, exploratory and quantitative, composed of wheelchair, spinal cord, registered in the Rehabilitation Center of FAG, inserted in the design of adapted sports basketball on wheels "In Action" what happens in the gym at the same institution. The sample consists of 8 wheelchair evaluated before the start of activities and after 6 months of practicing adapted sport during the months from April to October 2011. Amounted to 24 meetings a week, lasting 2 hours.

The inclusion criteria considered were: preserved function of the upper limbs (ULs), medical clearance for physical exercise and signing the consent form (ICF).

The evaluation of the lungs was measured by manometer apparatus Commercial Medica. Data collection was made in the sector of Cardiopulmonary Rehabilitation Center FAG, the academic responsible. Practitioners performed the manometer to the measurement of maximal inspiratory pressure (MIP) and maximal expiratory pressure (MEP). The criteria for performing the tests followed the criteria of the American Thoracic Society (2002).

Data were analyzed using simple statistical means and standard deviations and tabulated using SPSS (2005). The Student's t test was used to compare the mean pressures before and after basketball program adapted.

RESULTS AND DISCUSSION

According to the data values were measured pre-program comprising MIP average -99.66 ± 23.88 cm/H2O. The minimum value found for this pressure was -60cm/H2O and maximum -120cm/H2O. When analyzing the initial maximum

expiratory pressure was found to average 81.66 ± 22.28 cm/H2O with minimum and maximum 50cm/H2O 110cm/H2O. (Table 1)

At the end of the adapted sports program there was average -110 ± 12.64 cm/H2O MIP. The minimum value found for this pressure was -90cm/H2O and maximum -120cm/H2O. When analyzing the end expiratory pressure found an average of 100 ± 16.73 cm/H2O with minimum and maximum 50cm/H2O 110cm/H2O. (Table 1)

When applied statistical analysis comparing the maximal respiratory pressures before and after the program was found statistically significant values for both pressures, MIP and MEP p = 0.004 p = 0.029. The data suggest that the adapted sports program on a wheelchair increases the maximal respiratory pressures. (Table 2)

Table 1. Statistical description of pre and post values of Pimax and Pemax in cm/H2O.

Pre				Post		
Minimum	Maximum	Media	DP	Minimum	Maximum	Media	DP
Pimáx-60,00	- 120,00	-96,66	23,38	-90,00	-120,00	-110	12,64
Pemáx50,00	110,00	81,66	22,28	80,00	120,00	100	16,73

Table 2.T-test correlation and significance.

	Nº	Correlação	p
PimáxPre – Pimáx Post	8	0,947	0,004
PemáxPre – Pemáx Post	8	0,858	0,029

Respiratory involvement in spinal cord injuries can be evidenced by the considerable decrease in muscle strength, as measured by maximal inspiratory and expiratory maximal static. The reduction of these pressures occurs by respiratory muscle weakness or paralysis, as well as by changes in mechanical ventilation. In this sense, we can ensure the importance of measurement of maximal static respiratory pressures in the workup of patients with traumatic spinal cord injury (MATEUS, 2006).

According to the literature, studies show data reporting aspects of rehabilitation and the opportunity for social inclusion, illustrating several examples of people who, through great efforts, through sport, can overcome the deficiency and prejudice. However, incentives are needed for these individuals to start a sports activity as a means of inclusion and quality due, in this case, the sport certainly is a large outlet (SENATORE, 2007).

As SILVA (2005) the benefits reported in the literature on the training of athletes with SCI are: improvement of maximum oxygen consumption (VO2 max), gain in aerobic capacity, reduced risk of cardiovascular diseases and respiratory infections, decrease the incidence of medical complications (urinary tract infections, kidney infections and bedsores), reduced hospitalizations, increased life expectancy, increased levels of community integration, help in dealing with disabilities, fostering independence, improved self-image, self-esteem and satisfaction with life and decrease the likelihood of psychological disorders.

MACHADO (2008) reports that the abdominal muscles, such as the respiratory muscles are predominantly expiratory action and are innervated by nerves T7 to T12 thoracic and first lumbar nerve, and is therefore consistently less affected than the inspiratory muscles, regardless of the level of injury marrow.

The benefits of resistance exercise go beyond the obvious improvements in muscle performance because it includes the positive effects on the cardiovascular system, connective tissue and bone also influence the function. These individuals come to perform daily activities more easily because they are working with a smaller percentage of its maximum capacity. This improved functioning can also enhance the feeling of well-being and independence of the patient (HALL, 2007).

CONCLUSION

This article shows that physical activity adapted by adapted basketball program promotes improved lung function and respiratory muscle strength by significantly increasing maximal respiratory pressures. Studies with larger number of participants should be conducted in the future.

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EVALUATION OF MAXIMAL RESPIRATORY PRESSURES WHEELCHAIR PRE AND POST IN BASKETBALL IN WHEELCHAIR ADAPTED

SUMMARY

Introduction: Spinal cord injury, regardless of etiology, sets a new routine for the affected, and this requires changes and adaptations in the various roles and activities undertaken so far.

It is wheelchair to find new ways to get to experience autonomy and independence in their new activities. The adapted sports emerged after the Second World War in order to handle and socialize the war disabled. The manometer is a simple method is considered useful as a means of evaluating the condition of the respiratory muscle strength in patients with spinal cord injury. Objective: To evaluate respiratory muscle strength before and after the practice of adapted sports basketball on wheels. Methodology: The study will consist of eight male patients suffering from traumatic spinal cord injury complete or incomplete submitted the practice of basketball in a wheelchair, who chose to perform the activity and participate voluntarily in the research, testing the strengthof respiratory muscles through the Commercial unit manuvacuometroMedica. Results: We found values which include pre-program average MIP cm/H2O -99.66 ±23.88. The minimum value found for this pressure was -60cm/H2O and maximum -120cm/H2O. When analyzing the initial maximum expiratory pressure was found to average81.66 ± 22.28 cm/H2O with minimum and maximum 50cm/H2O 110cm/H2O. At the end of the adapted sports program there was average -110 ± 12.64 cm/H2O MIP. The minimum value found for this pressure was -90cm/H2O and maximum -120cm/H2O. When analyzing the end expiratory pressure found an average of 100 ± 16.73 cm/H2O with minimum and maximum 50cm/H2O 110cm/H2O, thus presenting a significant increase in muscle strength. Conclusion:It appears that the sport well suited to promote the interaction pisicosocial wheel chair, increases respiratory muscle strength.

KEYWORDS: muscle strength, Spinal Cord Injury; adapted sports.

L'ÉVALUATION DES AVANT RESPIRATOIRES MAXIMALES PRESSIONS FAUTEUIL ROULANT ET AFFICHER DANS BASKETBALL EN FAUTEUIL ROULANT ADAPTÉ

SOMMAIRE

Introduction: Lésion de lamoelleépinière, quel que soitl'étiologie, établit une nouvelle tinepourlespersonnesaffectées, et cela exige deschangements et desadaptationsdansles divers rôles et activitésmenées à cejour.

Il est en fauteuil roulant de trouver de nouvellesfaçons de fairel'expérience d'autonomieet d'indépendancedansleursnouvellesactivités. Lessportsadaptés a émergéaprèslaDeuxièmeGuerremondialeafin de gérer et de socialiserles invalides de guerre. Le manomètre est une méthodesimple est considérécommeunmoyenutile d'évaluerl'état de la force desmusclesrespiratoires chez lespatientsaveclésion de lamoelleépinière.

Objectif:évaluerla force desmusclesrespiratoires avant et aprèsla pratique de sportsadaptésaubasketsurroues.

Méthodologie: L'étude se composera de huitpatients de sexemasculinsouffrantdelésions de lamoelleépinièretraumatiquecomplète ou incomplètesoumis à la pratique dubasket-ballen fauteuil roulant, qui a choisi d'exercer l'activité et de participervolontairement à larecherche, de testerla force desmusclesrespiratoires à traverslesunitécommercialemanuvacuometro Medica.

Résultats:Nousavonstrouvédesvaleursquicomprennentlamoyennepré-programmeMIP cm/H2O -99,66 ± 23,88. La valeurminimaletrouvéepourcettepression a été -60cm/H2O et maximum -120cm/H2O.

Lorsquel'onanalyselapressionexpiratoiremaximuminitial a ététrouvéenmoyenne à 81,66 ± 22,28 cm/H2O avecminimum et maximum 50cm/H2O 110cm/H2O. A la fin du programme de sport adaptéil y avait en moymoyenne -110 ± 12,64 MIP cm/H2O. La valeurminimaletrouvéepourcettepression a été -90cm/H2O Et maximum -120cm/H2O. Lorsquel'onanalyselapression de fin d'expirationatrouvé une moyenne de 100 ± 16,73 cm/H2O avecminimum et maximum 50cm/H2O110cm/H2O, présentantainsi une augmentationsignificative de la force musculaire. Conclusion: Il semble que lesportbienadaptépourpromouvoirle fauteuil roulantd'interactionpisicosocial, augmentela force desmusclesrespiratoires.

MOTS-CLÉS:la force musculaire, lestraumatismesmédullaires; sportadapté.

EVALUACIÓN DE LAS PRESIONES RESPIRATORIAS MÁXIMAS PRE Y POST SILLA DE RUEDAS EN BÁSQUETBOL EN SILLA DE RUEDAS ADAPTADA

RESUMEN

Introducción: La lesión de lamédula espinal, independientemente de laetiología, estableceunanueva rutina para losafectados, y estorequierecambios y adaptacionesenlas diversas funciones y actividades realizadas hasta la fecha. Se trata de sillas de ruedaspara encontrar nuevasmaneras de llegar a experimentar laautonomía e independenciaen sus nuevasactividades. El deporte adaptado surgido trasla Segunda Guerra Mundial conelfin de gestionar y socializar losdiscapacitados de guerra. El manómetro esun método simple se considera útil como medio de evaluarlacondición de lafuerza muscular respiratoriaen pacientes conlesión de lamédula espinal. Objetivo:evaluarlaresistencia de los músculos respiratorios antes y después de laprácticadelbaloncestoadaptadodeportes sobre ruedas.Metodología: El estudio consistirá enocho pacientes del sexo masculino que sufren de una lesión traumática de lamédula espinal completa o incompleta presentada laprácticadelbaloncestoensilla de ruedas, que ha elegido para realizar laactividad y participar voluntariamente enlainvestigación, laspruebas de resistencia de los músculos respiratorios a través de launidad comercial manuvacuometro Medical. Resultados: Se encontraron valores que incluyenpre-programa de media MIP cm/H2O -99,66 ± 23,88. El valor mínimo encontrado para esta presión se -60cm/H2O y -120cm/H2Omáximo. Al analizarlapresiónespiratoria máxima inicial se encontróunpromedio de81,66 ± 22,28 cm/H2O con mínimos y máximos 50cm/H2O 110cm/H2O. Al final del programa de

deportes adaptados que era la media -110 ± 12,64 MIP cm/H2O. El valor mínimo encontrado para esta presión se -90cm/H2O y -120cm/H2O máximo. Al analizarlapresiónespiratoria final encontróunpromedio de 100 ± 16,73 cm/H2O con mínimos y máximos 50cm/H2O 110cm/H2O, presentando asíun aumento significativo enlafuerza muscular. Conclusión: Parece que el deporte adecuado para promover lainteracción de lasilla de ruedaspisicosocial, aumenta lafuerza de los músculos respiratorios.

PALABRAS CLAVE: fuerza muscular, lesión de lamédula espinal, deporte adaptado.

AVALIAÇÃO DAS PRESSÕES RESPIRATÓRIAS MÁXIMAS EM CADEIRANTES PRÉ E PÓS BASQUETE ADAPTADO EM CADEIRA DE RODAS

RESUMO

Introdução: A lesão medular, independente da sua etiologia, determina um novo cotidiano para o acometido, sendo que este o obriga a mudanças e adaptações nos diversos papéis e atividades que desenvolvia até então. Cabe ao cadeirante encontrar novas formas de vivencias para adquirir autonomia e independência nas suas novas atividades. O esporte adaptado surgiu após a segunda Guerra Mundial com objetivo de tratar e socializar os mutilados de guerra. A manovacuometria é um método simples, considerada útil como forma de avaliar a condição da força muscular respiratória de pacientes portadores de lesão medular. Objetivo: Avaliar a força da musculatura respiratória pré e pós a pratica do esporte adaptado basquete sobre rodas. Metodologia: O estudoserá composto por 8 pacientes do sexo masculino portadores de lesão medular traumática completa ou incompleta submetidos a prática de basquete em cadeira de rodas, que optaram por realizar a atividade e participar voluntariamente da pesquisa, testando a força da musculatura respiratória através do aparelho manuvacuometro Comercial Medica. Resultados: Foram encontrados valores pré-programa que compreendem médias de Pimáx -99,66±23,88cm/H2O. O valor mínimo encontrado para essa pressão foi de -60cm/H2O e o máximo de -120cm/H2O. Quando analisada a pressão expiratória máxima inicial encontrou-se média de 81,66±22,28cm/H2O com valores mínimos de 50cm/H2O e máximos de 110cm/H2O. Ao termino do programa de esporte adaptado verificou-se médias de Pimáx -110±12,64cm/H2O. O valor mínimo encontrado para essa pressão foi de

-90cm/H2O e o máximo de -120cm/H2O. Quando analisada a pressão expiratória máxima final encontrou-se média de 100±16,73cm/H2O com valores mínimos de 50cm/H2O e máximos de 110cm/H2O, apresentando assim aumento significativo de aumento da força muscular. Conclusão: Constata-se que o esporte adaptado além de promover interação pisicosocial do cadeirante, aumenta a força da musculatura respiratória.

PALAVRAS CHAVES: Força muscular; Lesão Medular; Esporte adaptado.