

19 - STUDY OF EXERCISE CAPACITY, THE TEST DISTANCE TRAVELED IN SIX MINUTES (DP6MIN) IN PATIENTS WITH LEPROSY

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INTRODUCTION

Leprosy is an infectious disease transmitted from person to person through contact among susceptible to infectious patients without treatment (GOULART, PENNA, CUNHA, 2002).

The etiologic agent, *Mycobacterium leprae* is an obligate intracellular bacillus host, which can cause inflammation, immune responses and compression processes that can evolve from a neuropraxia a neurotmesis, or nerve damage from a mild and transitory to a complete and irreversible injury nerve. The involvement of peripheral nerves is the main characteristic of the disease and may lead to patient disability and impairment, diminishing their ability to work, limiting her social life, becoming the victims of stigma and prejudice (GONÇALVES, SAMPAIO, Antunes, 2008). Peripheral nerves because they are mixed, when engaged, produce sensory changes such as numbness and anesthesia, which favor the appearance of ulcerations and / or palmar; motor abnormalities such as atrophy, paralysis, joint locks, which favor the appearance of deformities and disabilities physical (DIAS, CYRINO, LASTORIA, 2007).

Physical disabilities lead to the onset of functional disability, which in turn may influence the exercise capacity of patients. The test of exercise capacity was used to test the distance walked in six minutes (Dp6min), recommended by ATS (American Thoracic Society) in 2002. The DP6min is a submaximal test that assesses functional ability in a holistic and integrated the responses of all systems, including the pulmonary, cardiovascular, circulatory, neuromuscular units and muscle metabolism. Like most daily activities are carried out at submaximal level, the test better reflects the functional exercise capacity of patients (American Thoracic Society, 2002). The objective of this study was to evaluate the exercise capacity of patients suffering from leprosy, the test of distance walked in six minutes (DP6min) in the physiotherapy clinic at State University of West of Paraná - UNIOESTE.

METHODS

We evaluated 9 subjects above 18 years of age diagnosed with leprosy, and 3 females, mean age 52.7 ± 10 years. The patients were referred by primary health care (SUS) to the Physical Therapy Clinic Unioeste. The volunteers were informed about the objectives and procedures of the study and signed a consent form. The research project was approved by the Ethics in research involving human Unioeste. We excluded patients with musculoskeletal limitations of the lower limbs that prevented the achievement of functional tests and cognitive limitations.

Dp6min The test was conducted in the same time, where individuals were advised to use shoes and comfortable clothes, not eating at least one hour before and not do any physical activity for 24 hours before testing. Before starting the tests the patients remained fifteen minutes rest in sitting position for stabilization of vital signs. After they were checked vital signs (blood pressure, heart rate and respiratory rate). The degree of dyspnea, pain or fatigue of the lower limbs was assessed by the scale of perceived exertion - Borg Scale (EB), 2000. Patients were instructed to stop the tests only when they felt unable to tolerate stress or reached their highest degree of exhaustion. At the end of the tests, the distances were recorded and tested again the vital signs and level of perceived exertion. To test DP6min was followed to standardize the American Thoracic Society Statement (ATS) Guidelines for the Six-Minute Walk Test (2002), in which patients were instructed to walk as quickly as possible, 30 meters from the metro marked meters in a straight line between two cones, six minutes. Every minute patients were encouraged by standardized phrases and distance traveled was recorded. The predicted value for DP6min was calculated based on Troosters (1999). To assess the degree of subjective sensation of dyspnea and fatigue of the lower limbs (LL), the scale of perceived exertion modified Borg, which ranges from 0 to 10. Statistical analysis Quantitative variables were expressed as mean and standard deviation. We used the program GraphPad Prism, version 3.0.

RESULTS

The average distance traveled by patients was 516.6 ± 28 during the course of DP6min. Table 1 shows the results of the initial heart rate and end-systolic and end early, and the initial diastolic pressure and end. Table 2 shows the results for the Borg scale related to the initial and final dyspnea and fatigue related to the lower initial and final.

Table 1: heart rate, systolic and diastolic initial and final

HR initial (bpm)	HR final (bpm)	SBP initial (mmHg)	SBP final (mmHg)	DBP initial (mmHg)	DBP final (mmHg)
Mean \pm SD	Mean \pm SD	Mean \pm SD	Mean \pm SD	Mean \pm SD	Mean \pm SD
77,4 \pm 13	115,7 \pm 6	125,5 \pm 21	144,4 \pm 42	81,1 \pm 7	85,5 \pm 14

Values expressed as mean \pm standard deviation (SD). HR = heart rate. SBP = systolic blood pressure. DBP = diastolic blood pressure.

Table 2: Borg scale related to dyspnea and fatigue of the lower initial and final

BORG DYSPNEA initial	BORG DIYSPNEA final	BORG LL initial	BORG LL final
Mean ± SD	Mean ± SD	Mean ± SD	Mean ± SD
1,3 ± 4	3,3 ± 5	2,6 ± 1	5,3 ± 4

Values expressed as mean ± standard deviation (SD). LL = lower limbs.

DISCUSSION

Studies relating patient with sequel of leprosy and their ability to exercise are very scarce. It is known that these patients have some functional disability, but their functional exercise capacity is poorly understood. In this study we used the test DP6min to assess the ability to exercise these rights and obtained an average of 516.6 meters traveled by these patients. ENRIGHT (2003) suggests that healthy individuals can make up this test, distances ranging between 400.0 and 700.0 meters. Troosters, and GOSSELINK DECRAMER (1999) applied the DP6min in healthy patients aged between 50 and 85 years and obtained an average of 631.0 meters. Already BAUTMANS, LAMBERT and METS (2004) studied exercise capacity in elderly patients with a mean age of 65.1 years and reached a mean distance of 603.0 meters. We see then that despite widespread complaints of pain and muscle weakness of these patients, the functional capacity of this sample was not compromised as compared with the literature.

But it was not considered the time of the disease which could compromise the level of functional capacity of these patients. In relation to heart rate BRUNETTO, Pitta and PAULIN et al. (2003) evaluated 74 patients with a mean age of 65, suffering from Chronic Obstructive Pulmonary Disease (COPD), the test DP6min and found an average of 92.7 bpm for baseline heart rate and 119.89 bpm for heart cardiac end. RODRIGUES MENDES and VIEGAS (2004) also applied the same test in COPD and found a mean baseline of 81 bpm and 111 bpm average post-test. In our study we obtained an average of 77.4 bpm of baseline heart rate and 115.78 bpm heart rate end.

Nothing can observe or compare the literature with a similar population.

To assess the degree of subjective sensation of dyspnea, the scale of perceived exertion modified Borg. In this study patients indicated an average of 1.3 before the test and 3.3 post DP6min resulting in an increase of 154% in scale. In another study the test was performed in patients with moderate to severe COPD and these showed an average of 2.38 of dyspnea DP6min before and 4.62 after the test resulting in a 94% increase in range (Brunetti, Pitta and PAULIN et al., 2003). SILVA, SAMPAIO and Borghi-Silva et al. (2007) applied the test in asthmatic women and sedentary women. The asthmatics showed an average of 1.9 of subjective sensation of dyspnea after DP6min and sedentary indicated average of 0.4 post-test. In another study of patients with COPD the overall grade of dyspnea (Borg scale) was 4 (Rodrigues, MENDES and VIEGAS, 2004).

Besides the subjective sensation of dyspnea a modified Borg scale was also used to assess the degree of fatigue of the lower limbs. In a study of Machado, and SQUASSONI NATALI et al. (2007) The DP6min was applied to patients with COPD and these patients showed an average of 1.1 fatigue before starting the test and the average after the end of the test was 0.62 resulting in a decrease of 44% on the post test. In this study the initial average was 2.67 and the average post-test was 5.33 resulting in an increase of 99% after the test. Thus we can see that despite the distance traveled by patients with sequel of leprosy is similar to that of healthy subjects, the subjective degree of dyspnea and fatigue of the lower limbs are high when compared with healthy populations and people with lung disorders, indicating that the Leprosy can cause increased stress during physical exertion.

Taking into account the pressure, ARAÚJO, MAKDISSE and PERES et al. (2006) applied the DP6min in elderly patients with myocardial infarction and older without heart disease with a mean of 76.0 years. Elderly patients with previous myocardial infarction had initial systolic blood pressure mean 132.86 mmHg and middle initial of 80.7 mmHg, as the final average systolic pressure was 157.14 mmHg and end-diastolic pressure averaged 87.8 mmHg.

Older people without heart disease had initial systolic blood pressure averaged 121.8 mmHg and mean diastolic blood pressure of 79.3 mmHg, as the final systolic blood pressure averaged 154.3 mmHg and mean end-diastolic pressure was 81.8 mmHg. In another study, the test was applied to patients with COPD with a mean age of 66.2 years. Patients had an average initial systolic pressure of 140.7 mmHg and the initial average of 81 mmHg, as the final average systolic pressure was 149 mmHg and end diastolic pressure was 82 mmHg (MACHADO, and SQUASSONI NATALI et al., 2007). In this study, patients suffering from leprosy initial systolic blood pressure averaged 125.5 mmHg and 81.1 mmHg original, since the final average systolic pressure was 144.4 mmHg and mean end-diastolic pressure was 85.5. We observed that blood pressure in patients with leprosy is in a variation range considered normal when it is performing the exercise (II Guidelines of the Brazilian Society of Cardiology on exercise testing).

There are no data in the literature on functional capacity test, especially DP6min in leprosy, which complicated the search. Furthermore, it is suggested that further studies, applying the same test on a larger population of patients suffering from leprosy so that new data can be compared.

CONCLUSION

This study demonstrated that in spite of deformities and disabilities of patients with sequel of Hansen's disease, exercise capacity demonstrated in this sample is similar to the capacity of healthy subjects.

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STUDY OF EXERCISE CAPACITY, THE TEST DISTANCE TRAVELED IN SIX MINUTES (DP6MIN) IN PATIENTS WITH LEPROSY

ABSTRACT

Introduction: Leprosy is an infectious disease transmitted from person to person through contact among susceptible to infectious patients. It commits the peripheral nerves leading to disability and impairment to the individual, and generates motor abnormalities such as atrophy, paralysis and joint locks. The test of distance walked in six minutes (DP6min) evaluates the functional exercise at submaximal and was therefore chosen to evaluate the exercise capacity of patients in this study. **Objective:** To evaluate the exercise capacity of patients suffering from leprosy, the test of distance walked in six minutes (DP6min) in the physiotherapy clinic at State University of West of Paraná - UNIOESTE. **Methods:** The DP6min was applied in 9 subjects above 18 years of age diagnosed with leprosy, and 3 females, mean age of 52.78 ± 10 years. **Results:** The average distance traveled by patients was 516.6 ± 28 during the course of DP6min. **Conclusion:** Despite the deformities and physical disabilities of patients with sequel of leprosy, the ability to exercise the same is similar to the ability of healthy individuals.

KEYWORDS: Leprosy, exercise capacity, disability

RÉSUMÉ

Introduction: La lèpre est une maladie infectieuse transmise de personne à personne par contact chez les patients sensibles à infectieuses. Elle engage les nerfs périphériques conduisant à l'invalidité et la déficience de l'individu, et génère des troubles moteurs comme l'atrophie, la paralysie et les serrures communes. Le critère de la distance parcourue en six minutes (DP6min) évalue l'exercice fonctionnel au sous-maximal et a donc été choisie pour évaluer la capacité d'exercice des patients dans cette étude. **Objectif:** évaluer la capacité d'exercice des patients atteints de la lèpre, le critère de la distance parcourue en six minutes (DP6min) dans la clinique de physiothérapie à l'Université d'État de l'ouest du Paraná - UNIOESTE. **Méthodes:** La DP6min a été appliqué dans 9 sujets de plus de 18 ans un diagnostic de la lèpre, et 3 femmes, âge moyen de $52,78 \pm 10$ ans. **Résultats:** La distance moyenne parcourue par les patients était de $516,6 \pm 28$ au cours de DP6min. **Conclusion:** Malgré les déformations et les handicaps physiques des patients présentant des séquelles de la lèpre, la capacité d'exercer la même chose est semblable à la capacité des individus sains.

RESUMEN

Introducción: La lepra es una enfermedad infecciosa transmitida de persona a persona a través del contacto entre los susceptibles a los pacientes infecciosos. Compromete a los nervios periféricos que conducen a la discapacidad y la discapacidad para el individuo, y genera trastornos motores como la atrofia, parálisis y bloqueos conjuntos. La prueba de la distancia caminada en seis minutos (DP6min) evalúa el ejercicio funcional en submáxima y fue elegido por tanto para evaluar la capacidad de ejercicio de los pacientes en este estudio. **Objetivo:** Evaluar la capacidad de ejercicio de los pacientes enfermos de lepra, la prueba de la distancia caminada en seis minutos (DP6min) en la clínica de fisioterapia de la Universidad Estatal del Oeste del Paraná - UNIOESTE. **Métodos:** El DP6min se aplicó en 9 sujetos de más de 18 años de edad con diagnóstico de lepra, y 3 mujeres, edad media de $52,78 \pm 10$ años. **Resultados:** La distancia promedio recorrida por los pacientes fue de $516,6 \pm 28$ en el curso de DP6min. **Conclusión:** A pesar de las deformidades y discapacidades físicas de los pacientes con secuelas de la lepra, la capacidad de ejercer la misma es similar a la capacidad de los individuos sanos.

PALABRAS CLAVE: lepra, la capacidad de ejercicio, la discapacidad

ESTUDO DA CAPACIDADE DE EXERCÍCIO, PELO TESTE DE DISTÂNCIA PERCORRIDA EM SEIS MINUTOS (DP6MIN), EM PACIENTES COM SEQUELAS DE HANSENÍASE.**RESUMO**

Introdução: A hanseníase é uma doença infecciosa transmitida de pessoa a pessoa através do convívio de suscetíveis com doentes contagiantes. Ela compromete os nervos periféricos acarretando deficiências e incapacidades ao indivíduo, além de gerar alterações motoras como atrofias, paralisias e bloqueios articulares. O teste de distância percorrida em seis minutos (DP6min) avalia a capacidade funcional de exercício a nível submáximo e por isso foi escolhido para avaliar a capacidade de exercício dos pacientes deste estudo. Objetivo: avaliar a capacidade de exercício de pacientes com seqüelas de hanseníase, pelo teste de distância percorrida em seis minutos (Dp6min), na clínica de fisioterapia da Universidade Estadual do Oeste do Paraná - UNIOESTE. Métodos: O DP6min foi aplicado em 9 indivíduos, acima de 18 anos de idade com diagnóstico de hanseníase, sendo 3 do sexo feminino, com média de idade de $52,78 \pm 10$ anos. Resultados: A distância média percorrida pelos pacientes foi $516,6 \pm 28$ durante a realização do DP6min. Conclusão: Apesar das deformidades e incapacidades físicas do paciente portador de seqüela de hanseníase, a capacidade de exercício do mesmo é semelhante à capacidade de indivíduos saudáveis.

PALAVRAS CHAVE: Hanseníase, capacidade de exercício, deficiência

PUBLICAÇÃO NO FIEP BULLETIN ON-LINE: <http://www.fiepbulletin.net/80/a2/19>