

DIZZINESS HANDICAP INVENTORY - IN A GROUP OF PATIENTS UNDERGOING CUSTOMIZED VESTIBULAR REHABILITATION

Dizziness handicap inventory - em um grupo de pacientes submetidos a reabilitação vestibular personalizada

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ABSTRACT

Purpose: to investigate the impact of VR personalized and compare the physical, emotional and functional pre and post implementation of the Dizziness Handicap Inventory aspects. **Methods:** a total of 10 patients with symptoms caused by disorders of the vestibular system and diagnosis of chronic vestibular dysfunction. These were evaluated for physical, emotional and functional Dizziness Handicap Inventory through the pre and post customized vestibular rehabilitation. **Results:** in the pre Dizziness Handicap Inventory has been found that the physical was the highest scoring, followed by the emotional and functional Vestibular rehabilitation was effective, since there was a decrease in complaints of quality of life, and better results in all the aspects evaluated in Dizziness Handicap Inventory post, only one patient had only improves the functional and emotional aspects, in addition to worsening the physical aspects. **Conclusion:** the Brazilian Dizziness Handicap Inventory applied pre and post customized vestibular rehabilitation proved to be an efficient test to monitor patients undergoing vestibular rehabilitation, able to show significant improvement in symptoms of chronic vertigo, and the negative impact on quality of life of patients in this study.

KEYWORDS: Vestibule, Labyrinth; Questionnaires; Rehabilitation; Vertigo

■ INTRODUCTION

The integrity of the vestibular system is essential for the body balance and their maintenance in space. When something interferes with the normal functioning of this system emerges the dizziness and / or imbalance that may be of peripheral and / or central origin ¹.

Dizziness is one of the most common symptoms in the world, affects both genders and presents higher prevalence in adults, especially elderly². Vertigo is the most common type, and the main symptom is the rotational sensation and spatial disorientation, and it presents the acute form, in which the seizures are sudden, last from seconds

to days and may be accompanied by hearing loss and neurovegetative disorders such as nausea, vomiting, sweating, pallor, tachycardia, and the chronic form, in which seizures are intermittent or constant, ranging from mild to severe, and variable impact on the patients' quality of life³.

Vestibular rehabilitation (VR) has been recognized as the treatment of choice for patients with persistent vertigo caused by vestibular dysfunction, providing a marked improvement in the quality of life⁴. Even though rehabilitation exercises are relatively simple and easily done at home, as long as they follow a pre-established exercise protocol, recognized in scientific community⁵⁻¹¹ and supervised by a trained professional, actually only a small portion of patients who have dizziness symptoms' receive rehabilitation treatment^{12,13}.

The authors ¹⁴ recommend vestibular rehabilitation program in three elements: habituation

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Conflict of interest: non-existent

exercises that promote central nervous system compensation through repetition and stimulation of sensory organs, postural control exercises and conditioning activities overall.

These authors^{5,11,15-17} found in their studies that vertigo patients report improvement in symptoms after vestibular rehabilitation based on habituation exercises, and require no other treatment, which suggests that vestibular rehabilitation is effective in treating these patients.

In order to describe the consequences of dizziness, both physical and emotional functioning in daily activities of the vertiginous individual, it was developed and validated a specific questionnaire, the "Dizziness Handicap Inventory" (DHI)¹⁸, which has been adapted to a Brazilian version¹⁹. This tool is easy to apply, to analyze and to interpret, and assists in the diagnosis, choice of treatment and the clinical evolution, it is possible to compare with other studies, and it is the only questionnaire with the purpose of assess the effects of self-perception caused by dizziness^{18,19}.

The DHI leads to an effective improvement of balance symptoms, minimizes the probability of falls and increases feelings of security and independence of the elderly after RV²⁰. Despite the advances in the diagnosis of vertigo by otoneurological exams with

computerized records and more accurate findings, tests of the vestibular system are not particularly sensitive or specific to demonstrate the possible psychological interference in clinical and the patients suffering with dizziness, which suggests the importance of this type of questionnaire²⁰.

Considering the above, the present study aimed to describe the results obtained from the application of the DHI, pre and post customized vestibular rehabilitation in order to verify the efficiency of rehabilitation in this population.

METHODS

This is an observational, descriptive and therapeutic study.

This research was submitted to analyses and approval of the Committee of Ethics in Research of the Faculty of Philosophy and Sciences - UNESP and was performed after its approval, protocol number 0475/2012.

All participants presented symptoms caused by disorders of the vestibular system and were attended on the training program for students of physiotherapy and speech therapy of this university.

Table 1 describes the profile of the patients in this study.

Table 1- Description of the patients' profile

Age	Profession	Time of complaint	Symptoms	Chronic Disease	Continuous Medication	Life habits	Alimentation	Physical Activity
67	Craftsman	5 y	D and V	Hypertension; Cardiovascular disease	Yes	Smoking	Regular	Yes
74	Housewife	2 y	D and V	Diabetes; Hypertension; Hormonal alteration	Yes	Coffee	Regular	No
51	General services	2 y	V	None	Yes	Coffee	Irregular	No
56	Technical in nursing	3 y	V	Cardiovascular disease	Yes	None	Regular/ Fat and Carbohydrate	Yes
45	Assist with general services	1/1,5 y	V	Dysrhythmia	Yes	Excess of coffee	Regular/ Fat and Carbohydrate	No
29	Student	8 y	D and V	None	Yes	Excess of coffee	Regular	Yes
33	DJ	7 m	D	None	No	None	Regular	Yes
53	Case worker	8 m	V	Hypertension	Yes	None	Regular	Yes
58	Occupational therapist	4 y	D and V	Hypertension; Hearing loss	Yes	None	Regular/ Fat and Carbohydrate	No
24	Public server	2 y	V	None	No	Alcoholism (socially)	Regular	Yes

Legend: y = years / m = months / D = Dizziness / V = Vertigo

A total of ten patients participated in the intervention study (clinical trial), they presented dizziness and / or vertigo and were diagnosed with chronic vestibular dysfunction hypothesis. Among the patients, nine were female (90%) and one male (10%). Their ages ranged from 29 to 74 years with average of (50.71) years.

As inclusion criteria were selected all participants that attended the training program for students of physiotherapy and speech therapy who had medical diagnosis as chronic vestibular dysfunction, attributed to the fact that they presented constant symptoms, usually mild, and these symptoms impacted on quality of life. Furthermore, were included only those participants who performed 16 sessions of vestibular rehabilitation personalized proposals.

Were excluded from the sample patients who had no medical diagnosis of chronic vestibular dysfunction and who did not undergo 16 sessions proposed.

As for the time-related complaints it ranged from seven months to eight years, they also informed that there was a fluctuation on the time of symptom; crises manifested themselves during different periods of time. During this period there were no reported injuries due to the complaint.

The higher incidences of chronic diseases reported by patients were hypertension and cardiovascular disease; only two did not present these diseases.

The most common symptoms when describing an episode of dizziness were: nausea and vomiting, six patients reported nausea, four reported vomiting, three mentioned sweating and two presented tachycardia.

In anamnesis, eight patients reported use of medication for hypertension, diabetes and cardiovascular disease. No participants used medication for vestibular disorders during customized vestibular rehabilitation (CVR).

As for eating habits and physical activity, the group presented divergent information; some patients reported having a regular eating habits and physical activity, while the other part was found to have irregular eating habits and do not practice any physical exercises.

In order to perform this study were applied the following:

- Post-Informed consent term: As resolution of the National Health Council 196/96, prior to the beginning of the evaluations, participants must have signed the term of Informed Consent to permit the realization of the study;
- Anamnesis (Figure 1): A questionnaire focusing on complains, otoneurological signs and

symptoms, chronic diseases, use of medications, dietary habits and physical activity. There were excluded from the study patients who had no symptoms that were suggestive of chronic vertigo.

- Application of a daily living questionnaire, DHI (Figure 2)²¹, which contains 25 questions, seven of which assess the physical aspects, nine the emotional aspects and seven the functional aspects, the patients were instructed to answer each question with the following answers: "yes", "no" or "sometimes." For every "yes" were added four points, for every "no" were added zero points and for every "sometimes", two points, the maximum score that a patient could achieve was 100 points. The higher the score values worse the quality of life. Another professional applied the questionnaire; this professional did not participate in the intervention in order to avoid bias in the application. The questionnaire was analyzed before and after customized vestibular rehabilitation.
- The vestibular evaluation consisted of tests which evidenced the presence of spontaneous, semi-spontaneous and optokinetic nystagmus, search of saccadic movements and skew deviation, identification of the quality and symmetry of eye movement and the presence or absence of nystagmus in diagnosis of peripheral vestibular dysfunction as Herdmann assessment protocol (1996)¹⁵, adapted by a team of speech therapists and physiotherapists.
- The personalized vestibular rehabilitation therapy was performed for eight weeks and was composed of selected protocols among the various authors⁵⁻¹⁰, especially Cawthorne & Cooksey^{7,8} and according to the requirements of each patient. An analysis of the selected protocols were performed and was prepared a customized protocol which consisted of head and eye movements, head and body movements and other activities to improve balance, targeting the neurophysiological mechanisms of compensation and habituation of the patient. The main goal of the protocol was to stabilize the visual and increase vestibular-visual interaction during head motion, provide better static and dynamic stability in situations of sensory conflict and decrease individual sensitivity during head movement⁵⁻¹⁰. A speech therapist and physiotherapist performed the interdisciplinary intervention.

Data analysis was performed as descriptive and quantitative in order to investigate the impact of Vestibular Rehabilitation and compare the scores of physical, emotional and functional aspects, pre-and post DHI. At first was given the normality of the data

Anamnesis	
Personal Data	
Name:	
Birth Date : __/__/__	sex: Marital Status:
Place of Birth:	
Address:	
Neighborhood:	City:
Tel: /	
Profession:	
Referral:	
Weight:	Height:
Anamnesis	
QP:	
Dizziness ()	
Vertigo ()	
How long: days () years () How Many: _____	
Traumas: () yes () no Which on:	
Description episode of dizziness:	
() nausea () vomiting () sweating () tachycardia	
() fall (aside: _____)	
Chronic diseases:	
() Diabetes	() Respiratory Diseases
() Hypertension	() Dyslipidemia
() Cardiovascular Disease	() Hormonal Changes
() Others:	
Medicines in Use:	
name: _____ dosage: _____	
use time: _____	
Habits of life: () smoking () alcoholism () illicit drugs	
() Overuse of coffee, black tea or guaraná	
Feeding: () respects regular times	
How many meals a day: _____	
() Or preference for fatty foods rich in carbohydrates physical activities	
Practice: () yes () what? _____ () which often	

Figure 1 – Anamnesis

Annex I.

DHI		ANSWERS/PUNCTUATION		
ASPECT	QUESTIONS	YES (4)	SOMETIMES(2)	NO (0)
Physical	1. Does looking upward worsen your problem?			
Emotional	2. Do you feel frustrated because of your problem?			
Functional	3. Do you limit your business or leisure travels because of your problem?			
Physical	4. Does walking through the corridor of a supermarket worsen your problem?			
Functional	5. Do you find difficulty to lay down or get up from bed because of your problem?			
Functional	6. Does your problem restrict significantly your participation in social activities such as: going out for dinner, going to the movies, dancing or going to parties?			
Functional	7. Do you find it hard to read because of your problem?			
Physical	8. Does your problem get worse when you perform more difficult activities such as sports, dancing, working indoors activities, such as sweeping and keeping the dishes?			
Emotional	9. Because of your problem, do you feel afraid of going out without someone who accompanies you?			
Emotional	10. Because of your problem, do you feel ashamed at the presence of other people?			
Physical	11. Do quick movements of your head worsen your problem?			
Functional	12. Due to your problem, do you avoid high places?			
Physical	13. Does turning in bed worsen your problem?			
Functional	14. Because of your problem, is it difficult for you to make indoor works heavy works or making backyard care?			
Emotional	15. Because of your problem, do you fear that people think you are drugged or drunk?			
Functional	16. Because of your problem, is it difficult for you to get out for a walk without help?			
Physical	17. Does walking in the sidewalk worsen your problem?			
Emotional	18. Because of your problem, is it difficult for you to concentrate?			
Functional	19. Because of your problem, is it difficult for you to walk in your house in the dark?			
Emotional	20. Due to your problem, do you fear staying home alone?			
Emotional	21. Due to your problem, do you feel you're disabled?			
Emotional	22. Does your problem damage your relationship with your relatives or friends?			
Emotional	23. Due to your problem, are you depressed?			
Functional	24. Does your problem interfere with your work or duties at home?			
Physical	25. Does becoming inclined worsen your problem?			

SUBSCALE	POINTS
Physical	
Emotional	
Functional	
TOTAL	

Figure 2 - Dizziness Handicap Inventory, Brazilian version

by means of the Shapiro-Wilk test for comparison of results between individuals of the same group, and in sequence was applied Wilcoxon. The differences in the tests were considered statistically significant when the value of “p” was less than 0.05 (5%), indicated with an asterisk (*). The statistical software used was STATISTICA 7.0 Software.

■ RESULTS

The customized vestibular rehabilitation was held at an average of 16 sessions per patient twice a week. At first were provided explanations about the body balance, physiology of exercise and guidelines

on inadequate conducts, such as: eating habits, excessive use of caffeine, tobacco, preference for fatty foods and stress, which had as a consequence delay of the improve.

The activities were selected on an individual basis considering the potential and difficulties of each patient in accordance to their physical limitations and, when necessary, the movements and activities were adapted as, for example, perform the exercise seated (for the elderly), stick pictures on the wall rather than follow them swinging arms, thus providing the correct performance of the exercise.

When the symptom improvement was achieved exercises were modified in terms of complexity of movements, carrying out activities in the standing position and expansion of the speed and amplitude

of eye and body movements. All patients were instructed to practice the exercises at home every day for eight weeks, following a printed script that explained the manner and order of exercises. Patients attended the appointments and were supervised on weekly visits. These visits aimed at tracking, monitoring and indication of new custom exercises.

At the end of the rehabilitation program, nine patients reported significant improvement of vestibular symptoms, and were submitted to DHI again.

Table 2 presents the DHI score for each patient individually, and the p values comparing pre-and post- customized vestibular rehabilitation.

Table 2 - Dizziness Handicap Inventory score, pre and post customized vestibular rehabilitation

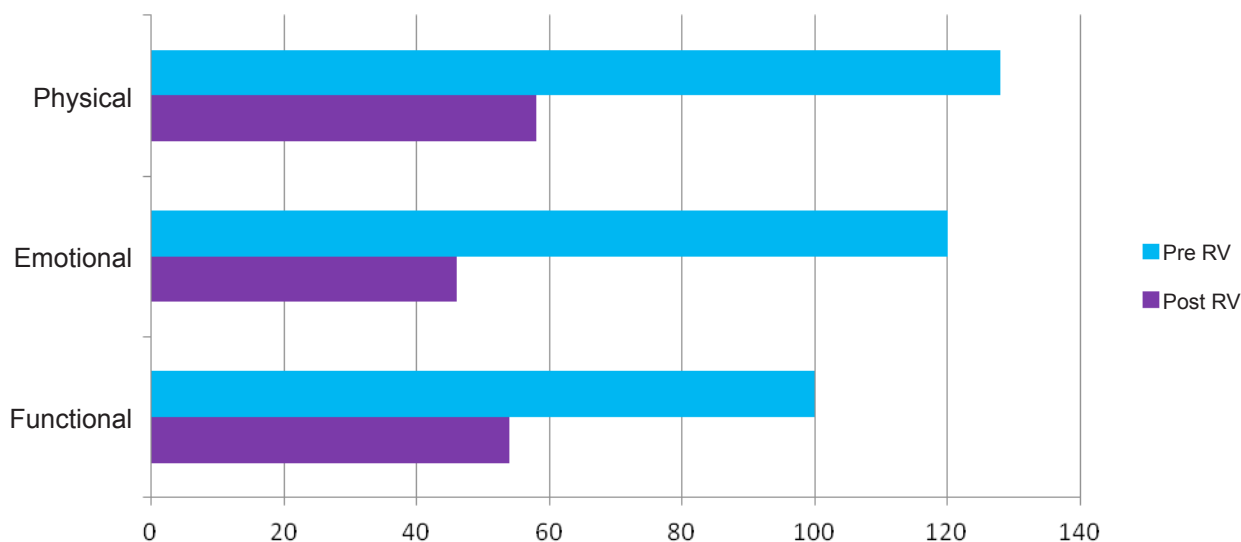
Pacient	Physical		P value	Emotional		P value	Functional		P value	Total		P value
	Pre	Post		Pre	Post		Pre	Post		Pre	Post	
1	14	0		20	0		8	4		42	4	
2	14	8		6	6		6	2		26	16	
3	26	4		16	6		8	0		50	10	
4	18	8		30	16		8	2		56	26	
5	12	8	0,009*	12	6	0,013*	14	12	0,013*	38	26	0,007*
6	14	12		14	4		2	2		30	18	
7	8	6		10	6		12	8		30	20	
8	16	4		0	0		12	6		28	10	
9	14	4		8	0		18	6		40	10	
10	2	4		4	2		12	8		18	14	

Shapiro-Wilk e Wilcoxon Test.

It was observed that of the ten patients, nine showed improvement in all aspects of the questionnaire, and one got better scores on the emotional and functional aspects, which allowed a statistically significant result in all aspects.

Figure 3 shows the scores for the group regarding physical, emotional and functional aspects; from the application of DHI pre and post customized

vestibular rehabilitation. In the graph it is evident that physical aspects had higher scores, followed by the emotional and functional aspects. The graph also shows a reduction of the score obtained by each patient; post customized vestibular rehabilitation, indicating the physical aspect as the lowest, followed by functional and emotional aspects.



Legend: VR- Vestibular Rehabilitation

Figure 3 - Dizziness Handicap Inventory score for the group, pre and post customized vestibular rehabilitation

■ DISCUSSION

The damages that dizziness / vertigo cause to the quality of life have attracted the attention of many researchers^{21,22} and the use of an instrument such as the DHI questionnaire to assess the quality of life of individuals suffering from dizziness is important for health professionals¹⁸.

Researchers²³⁻²⁵ observed, in a recent study, that customized vestibular rehabilitation is more effective than the original protocols of vestibuloocular reflex stimulation to improve the quality of life of individuals with chronic vertigo.

All patients, a total of 10, underwent customized vestibular rehabilitation and after eight weeks of intervention, nine patients had increased their security sense, self-esteem, self-confidence and returned slowly to perform activities of daily living they were accustomed without the manifestation of symptoms.

When applying DHI post customized vestibular rehabilitation, nine patients showed a difference between the scores before and after treatment between 10 and 40 points, and reported significant improvement of the symptoms related to physical, emotional and functional aspects. Authors¹⁸ claim that a difference of 18 points between the pre-and post-treatment would be indicative of significant change, which could be considered as a benefit, but in this study we found that a 10 point difference showed a significant improvement in the individuals' quality of life.

At the beginning of treatment six patients reported that they practiced have some physical activity. At the end of 16 sessions, nine patients showed improvement in symptoms of chronic vestibular dysfunction, suggesting that CVR was also effective in patients who did not practice any physical activity.

The literature²⁶ states that the physical scale is the most commonly affected, probably because many older people have a sedentary life and are away from professional and social activities, which makes minor household activities more demanding.

In this study we also observed that when comparing the functional, emotional and physical aspects, the last was where patients had higher evolution, and began to feel more comfortable when performing activities requiring greater movement, all patients reported at the beginning of CVR, insecurity in perform activities involving movement of the head, restriction to perform certain movements, fear of falling and to perform some daily living activities, among other signs and symptoms, and at the end of the CVR program the symptoms had disappeared, which corroborates other studies in which these results were also observed²⁵⁻²⁸.

In the present study, it was verified that when the DHI questionnaire pre-customized vestibular rehabilitation was applied, all patients reported that the dizziness caused some impact on their quality of life, in relation to functional, and emotional or physical aspects. These findings are consistent with studies^{20,24-27} that applied the DHI in populations with

chronic symptoms of vertigo, and also observed a negative impact on their quality of life.

In this study was found that customized vestibular rehabilitation was effective in the improvement of vestibular symptoms of these patients and DHI was a tool that allowed tracking of patient outcomes. These findings are consistent with a research^{28,29} who studied 37 patients with various otoneurological status and concluded that CVR is effective in reducing symptoms and improving the impact of dizziness on patient's quality of life, in addition corroborates with researches that applied the DHI before and after CRP and found that all patients had

improvement in quality of life, and reduced the DHI score in all its subscales.

■ CONCLUSION

The DHI, Brazilian version, applied pre and post customized vestibular rehabilitation proved to be an effective test to monitor patients undergoing vestibular rehabilitation, this device was able to show significant improvement in symptoms of chronic vertigo, and improved the quality of life of the patients in this study.

RESUMO

Objetivo: investigar o impacto da Reabilitação Vestibular personalizada e comparar os aspectos físicos, emocionais e funcionais pré e pós a aplicação do Dizziness Handicap Inventory. **Métodos:** participaram 10 pacientes, com sintomas decorrentes de distúrbios do sistema vestibular e hipótese diagnóstica de disfunção vestibular crônica. Estes foram avaliados quanto aos aspectos físicos, emocionais e funcionais por meio do Dizziness Handicap Inventory pré e pós reabilitação vestibular personalizada. **Resultados:** no Dizziness Handicap Inventory pré foi verificado que o aspecto físico foi o mais pontuado, seguido pelo emocional e funcional. A reabilitação vestibular foi eficaz, uma vez que houve diminuição nas queixas de qualidade de vida, e melhores resultados em todos os aspectos avaliados no Dizziness Handicap Inventory pós, apenas um paciente obteve melhora somente dos aspectos emocionais e funcionais, além de piora dos aspectos físicos. **Conclusão:** o Dizziness Handicap Inventory brasileiro aplicado pré e pós reabilitação vestibular personalizada mostrou-se como um teste eficaz para acompanhar pacientes submetidos a reabilitação vestibular, capaz de mostrar a melhora significativa nos sintomas da vertigem crônica, além do impacto negativo na qualidade de vida dos pacientes deste estudo.

DESCRIPTORIOS: Vestíbulo do Labirinto; Questionários; Reabilitação; Vertigem

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Received on: May 28, 2014

Accepted on: August 08, 2014

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