Original Article

DOI: 10.21276/ijchmr.2016.2.2.05

Vertigo in ICF Framework: A Pilot Study

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Abstract

Background: Vertigo is one of the commonly reported symptoms which lead to debilitating effect. The aim is to develop a questionnaire based on International Classification of Functioning Disability and Health (ICF) in the assessment of activity limitation and participation restriction in individuals with vertigo.**Material and Method:** The study was done in three phases, Phase 1 was collecting the evidence to capture different characteristics of Vertigo, and mapping on the ICF core sets, Phase 2 consisted of validation of the selected questions by the health care professionals who work with the patients with vertigo and the last phase was the cross-sectional study on patients (N=71) attending at multiple settings using the first version of the questionnaire.**Results:** The final checklist includes 31 questions. The questionnaire is a 5-point rating scale. It was administered on 71 (25 Males, 46 Females) patients with vertigo. In 12 items, more than 20% respondents reported complete problem (Score-4). In the test of equality of means, item number 12(t=-1.616), 13(t=-1.552) and 27(t=-1.789) were not significant to discriminate low group and high group. Cronbach's Alpha and Guttman split half co-efficient for 17 items of Body functions and Body structures is 0.719 and 0.802, for 9 items of Activities and Participation is 0.739 and 0.858, and for 5 items of Environmental factors is 0.233 and 0.348. **Conclusion:** The developed questionnaire allows simple, time efficient identification and qualification of the functioning profile of an individual in a simple, time efficient manner.

Keywords: *ICF, Vertigo, Activity limitation, Participation restriction*

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This article may be cited as: Arya R, Thawani P and Rangasayee R. Influence Vertigo in ICF framework: A Pilot Stud.Int J Com Health and Med Res 2016;2(2):32-37

Article Received: 30-05-16 **Accepted On:** 05-06-2016

INTRODUCTION

Vertigo, which is a subtype of dizziness, is a common complaint among patients seen by primary care physicians, neurologists, and otolaryngologists. It is often present along with nausea and vomiting as well as balance disorder, leading to standing or walking difficulties. Susceptibility to vertigo increases with age, affecting 40% of individuals aged 40 years and above[1]. Dizziness and vertigo are frequently reported medical issues and affect approximately 20%-30% of the general population.[2,3,4] Vertigo is a self reported phenomenon that can be observed through various tests like Electronystagmography, Dix Hallpike maneuver, Caloric reflex test, Vestibular Evoked Myogenic Potential etc. There are many questionnaires available for patients with dizziness/ vertigo which address different outcome measures. The widely used Dizziness Handicap Inventory (DHI)[5] is a self report of activity limitation and participation restriction resulting from dizziness and unsteadiness. However, this inventory does not focus on change in body

functions and changes in environmental interactions in individuals with vestibular problems. The Vertigo Handicap Questionnaire (VHQ)[6] is consisted of a structured interview design to generate statements consequent to the psychological and social consequences of vertigo. Vertigo Symptom Scale (VSS)[7] is used to assess the frequency and severity of dizziness symptoms. There is a lack of questionnaire which is based on a theoretical framework which completely covers all the domains of the patient suffering for vertigo. International classification of functioning, disability and health (ICF) developed by World Health Organization (WHO, 2001) is a classification system which provides the unified and standard language and framework for description of health and health related states. The domains and health-related domains are contained in ICF. These domains are described from the perspective of the body, the individual and society in two basic lists: (1) Body Functions and Structures; and (2) Activities and Participation. According to ICF, Functioning is an umbrella term encompassing all body functions, activities and participation; similarly, disability serves as an umbrella term for impairments, activity limitations or participation restrictions. ICF also lists environmental factors that interact with all these constructs. In this way, it enables the user to record useful profiles of individuals' functioning, disability and health in various domains. [8] Need for the study: There is a dearth of research done to assess the activity limitation and participation restriction in patients with vertigo. There is a need to have a universal language for all professionals involved in the assessment and management of vestibular disorders in order to assess the impact on one's life and also define outcome measures of treatment.The aim of the study is to develop and validate an ICF based questionnaire in the assessment of activity limitation and participation restriction in individuals with vertigo.

MATERIAL AND METHODS

The protocol for the study was approved by the Ethics Committee of Ali Yavar Jung National Institute for Hearing Handicapped (AYJNIHH). All procedures were in strict adherence to the protocol.

Phase 1: The systematic review of the literature on vestibular disorders was done from the internet sources of PubMed, Medline and SciELO databases. Out of the 32 full articles and already developed questionnairs reviewed , 5268 meaningful concepts were found resulting in 322 ICF categories. The category which was shown atleast in 5% of publications was included. Out of short listed questions, 31 questions were finally included in the tool according to the ICF constructs and domains.

Phase 2: It was sent for validation to five experts (one Otolaryngologist, two Audiologists, one Psychologist and an ICF expert). The questions were reframed and finalized with agreement of all experts. The validated questionnaire (Table-4) consisted of 31 items divided in two parts, Part-I, Functioning and Disability with two subdivisions i.e. 1.Body functions & Body structures and 2.Activities & Participation and Part-II Contextual Factors with one subdivision i.e. Environmental factors (Figure 1).

Phase 3: Empirical study was done at clinical setting. The checklist was administered on 71 patients (25 males, 46 females) in the age range of 25 to 75 years (Mean age of 36.5 years) reporting to the ENT Out Patient Department (OPD) of KEM hospital, Mumbai, Sion hospital, Mumbai and AYJNIHH, Mumbai with complaint of vertigo for atleast 6 months. Written consent was obtained from every subject for participation in the study. Questions were asked by researcher individually in the native language of the subject, wherever required. Additionally with the demographic data (Age, Sex, Duration of problem, Occupation), Audiometry data was also collected for all the patients.

Scoring: It was done on a 5 point rating scale. Scores ranged from 0 to 4 (0 to 100%) where 0 (0-4%) means no abnormality, 1 (5-24%) means mild problem, 2 (25-49%) means moderate problem, 3 (50-95%) means severe problem and 4 (96-100%) means complete problem.

STATISTICAL ANALYSIS:

Power of discrimination was done using t-test for group statistics and independent samples statistics (for equality of means) on each subdivision of the tool. High group and low group scores were tabulated using group statistics. For reliability test, Cronbach's alpha and split half reliability tests were done for all subdivisions.

RESULTS

Out of the 71 patients reported in OPD, 35% were males and 65% were females. Looking at

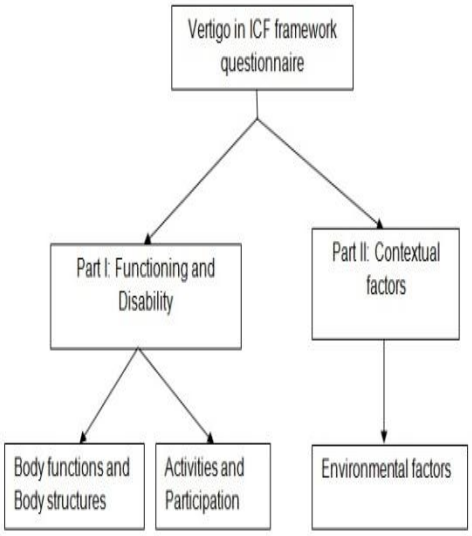

Figure 1: Questions framed according to different categories of ICF

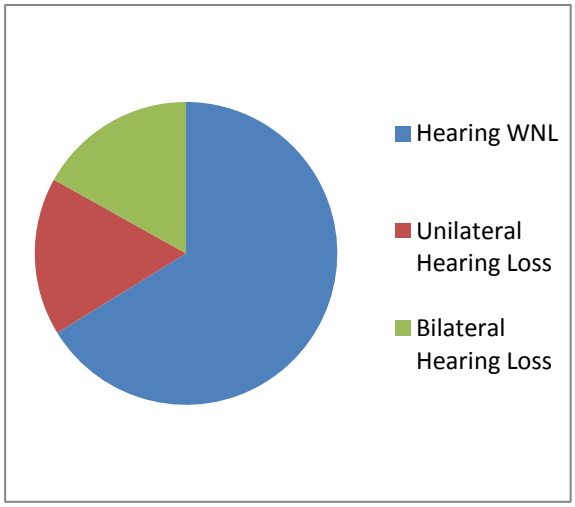

Figure 2: Audiological profile in patients reporting vertigo

descriptive statistics, 66% of the patients have normal hearing in both ears, 17% patients have unilateral hearing loss and 17% patients have bilateral hearing loss of various degrees (Figure 2). In 12 items of the questionnaire, more than 20% respondents reported complete problem (Score-4) in which 7 items were from the category of Body structures and body functions, two from Activities and Participation and three from Environmental factors.(Table-1)In the test of equality of means, item number 12, 13 and first item of environmental factors, were not significant to discriminate low group and high group (Table-2).To assess the reliability of the developed scale, Cronbach's Alpha and Guttman split half co-efficient were calculated for all the categories of the questionnaire and shown in Table-3.

DISCUSSION

In the present study an ICF based questionnaire is developed which is structured and covers all the domains of individual's functioning, health and disability. With Item Analysis, in body functions and structures, items with ICF coding b2404, b2405 (functioning and disability) and e202 (Contextual factors) were not significant. Hence all these items will be excluded from the final checklist. Therefore, out of the 31 questions, 29 questions will be included to assess the significant effects on functioning, activities and participation of persons with vestibular disorders. The questionnaire has good internal consistency for the questions on functioning and disability and medium reliability for the questions of contextual factors. It is seen in the present study that more than 20% patients reported problems in daily activities like, sitting, standing, sleeping etc. Many patients (25%) avoid driving completely because of vertigo, 28% restrict themselves completely from going to temple, park, mall because of Vertigo. Maximum number (59%) of the patients needs help of others for daily works. The quality of life in patients with vertigo is affected to a great extent.The study shows that females (n=46) reportedly were more affected by vestibular disorders as compared to males (n=25). In a retrospective study to see the prevalence of dizziness with aging, the females reported were more as compared to males (1.7:1) [9]. Women are more sensitive to motion than men, by a ratio of about 5:3, although this may be related to reporting differences rather than true physiological differences,[10] although this may be related to its impact on one's life rather than true physiological severity of vertigo. Balance problems are more common in women than men and increases with increasing age [11]. In the present study, out of 71 patients, 12 (17%) patients reported bilateral hearing loss (Pure Tone Average greater than 25dB HL) of various degrees. Vertigo is associated with hearing loss in patients with sudden sensorineural hearing loss [12]. Twelve patients out of 71 patients had unilateral hearing loss. In a study to find the vestibular lesions in patients with unilateral hearing loss, researchers found that in the group of 29 patients, 45% showed presence of vestibular dysfunction [13].

Table 1: ICF categories with complete problem (Score‘4’) in patients with Vertigo

Category	Question	No. of respondents with Score-4	Percentage
Body functions and Body structures	Do you have difficulty in balancing while walking?	16	22.50%
	The duration of your dizziness is _____	16	22.50%
	Do you feel dizziness more in a particular position like ting, sleeping, etc.?	20	28.17%
	Do you feel the room spinning around you or you are inning around the room?	20	28.17%
	Do you lose grip or experience sensation of fall due to dizziness?	16	22.50%
	Do you feel vomiting sensation due to dizziness?	17	23.90%
	Do you feel headache/ neck pain due to dizziness?	23	32.40%
Activities and Participation	Do you avoid driving due to balance problem?	18	25.08%
	Do you avoid going to public places like park, mall, temple etc. alone because of your balance problem?	20	28.17%
Environmental factors	Do you need help of a Dr./ nurse/ OT/ audiologist during attacks of dizziness?	15	21.12%
	Do you need support of your immediate family members (spouse, children, parents) due to dizziness?	42	59.15%
	Do you feel dizziness when exposed to loud sounds?	24	33.8%

Table 2: Items in the questionnaire that were not significant to discriminate low group and high group

Category	Item number	Question	t-value
Body functions and Body structures	12	Do you feel sensation of itching in ears?	-1.616
	13	Do you feel sensation of pressure in ears?	-1.552
Environmental factor	1	Do you use any walking device due to dizziness?	-1.789

Table 3: Reliability assessment of the questionnaire

Categories	Cronbach’s Alpha	Guttman Split half co-efficient
Body functions and Body structures	0.719	0.802
Activities and Participation	0.739	0.858
Environmental factors	0.233	0.348

Table 4: Assessment of Vertigo in ICF framework

Sr. No.	Part I	Functioning and Disability	Scoring				
	ICF code no.	**Body Functions and Structure**	**0**	**1**	**2**	**3**	**4**
1.	b2351	Do you have difficulty in balancing while walking?					
2.	b2401	The duration of your dizziness is					
3.	b2350	Do you feel dizziness more in a particular position like sitting, sleeping, etc.?					
4.	b2352	Do you feel the room spinning around you or you are spinning around the room?					
5.	b1100	Does your state of consciousness alter due to dizziness?					
6.	b1342	Is your sound sleep disturbed due to dizziness?					
7.	b1400	Do you feel difficulty in concentrating at something for a period of time required eg.reading, stitching?					
8.	b1560	Do you experience difficulty in discriminating shape, size or colour due to dizziness?					
9.	b1565	Do you experience difficulty in gauzing distance between two objects/ distance from self for eg. Distance between steps?					
10.	b2402	Do you lose grip or experience sensation of fall due to dizziness?					
11.	b2403	Do you feel vomiting sensation due to dizziness?					
12.	b2404	Do you feel sensation of itching in ears?					
13.	b2405	Do you feel sensation of pressure in ears?					
14.	b28010	Do you feel headache/ neck pain due to dizziness?					
15.	b7700	Does your way of walking or running get affected due to dizziness?					
16.	b2300	Do you feel difficulty in hearing soft sounds?					
17.	b2400	Do you feel some sound ringing in your ear?					
		Activities and Participation	**0**	**1**	**2**	**3**	**4**
1.	d4100	Do you find difficulty getting into and out of lying down position or standing up/ sitting down due to dizziness?					
2.	d4101	Do you find difficulty in squatting eg. Position for toileting at floor level?					
3.	d4102	Do you find difficulty in kneeling down such as in prayers, bending down and standing up?					
4.	d4751	Do you avoid driving due to balance problem?					
5.	d550	Do you face problem in eating and drinking?					
6.	d5702	Do you feel the need for support in your day to day activities?					
7.	d6200	Do you avoid going to public places like park, mall, temple etc. alone because of your balance problem?					
8.	d8451	Do you face difficulties at your work place due to dizziness?					
9.		Do you feel tense and distracted due to ringing in your ears?					
PART II		**Contextual factors**	**Scoring**				
		Environmental Factors	**0**	**1**	**2**	**3**	**4**
1.	e120	Do you use any walking device due to dizziness?					
2.	e250	Do you feel dizziness when exposed to loud sounds?					
3.	e345	Do you have a place to substitute at work during attacks of dizziness?					
4.	e355	Do you need help of a Dr./ nurse/ OT/ audiologist during attacks of dizziness?					
5.	e360	Do you need support of your immediate family member (spouse, children, parents) due to dizziness ?					

CONCLUSION

This quick test in ICF framework, contributes to assess the impact of vertigo on a person's life irrespective of the physiological severity. It can be applied by general physicians and all the health care professionals working with patients with vertigo. Using this questionnaire will help in better management of the patient.Limitation and Future directions: The questionnaire needs to be applied to more number of patients and compared with the control group.

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Source of support: Nil
Conflict of interest: None declared