ORIGINAL ARTICLE

Perceived changes in symptoms and quality-of-life amongst patients with dizziness: A single-centre experience in Malaysia

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ABSTRACT

Introduction: Dizziness is a common complaint by patients, yet it always presents as a diagnostic challenge to the attending clinician. An accurate diagnosis is essential to correctly administer the precise treatment regime, alleviate the symptoms, and improve the quality-of-life of patients who present with dizziness. A specialised vestibular clinic with a holistic approach of meticulous history-taking, complete physical examination, a collection of audio-vestibular test battery, and facilities for vestibular rehabilitation was set up to assist in the management of these patients. This study aims to investigate the effect of vestibular clinic intervention on the symptoms and quality-of-life of patients who were managed in the vestibular clinic.

Materials and methods: A total of 64 new patients who were managed in the vestibular clinic were selected and the validated Malay – Vestibular Rehabilitation Benefit Questionnaire (My-VRBQ) was completed during the first and follow-up visits to measure the changes in symptoms and quality-of-life before and after receiving care at the vestibular clinic.

Results: Our study showed that there was a positive effect of vestibular clinic intervention on the symptoms and quality-of-life of patients who were managed by the vestibular clinic. Statistically significant improvements were seen in the total My-VRBQ scores, symptoms scores, and quality-of-life scores. The subscale scores of dizziness, anxiety, and motion-provoked dizziness also showed statistically significant improvement among the patients who received care at the vestibular clinic.

Conclusion: This indicates that the vestibular clinic was an essential part of the work-up, diagnosis, and treatment of patients with dizziness; and a specialised vestibular clinic was able to bring about positive outcomes in the symptoms and quality-of-life of patients with balance disorders.

KEYWORDS:
Dizziness, quality-of-life, vestibular diseases, vestibular function tests

INTRODUCTION

Dizziness is defined as a non-specific complaint of unsteadiness and imbalance which can originate from disorders of many systems including the peripheral vestibular system, central nervous system, and cardiovascular system.[1] Dizziness can be broadly classified based on four main presenting complaints, namely; syncope or near syncope, disequilibrium, vertigo, and light headedness.[2]

It is a symptom that affects about 15% to 20% of adults yearly in large population-based studies. Its prevalence rises with age and is about two to three times higher in women than in men.[3] For Malaysia, a retrospective review of 100 walk-in patients at a specialized neurotology clinic in dizziness at a tertiary centre showed that 66% out of 100 patients who presented with dizziness were caused by peripheral vestibular causes.[1]

However, despite its prevalence, many patients with dizziness were unable to be accurately diagnosed and the treatment for these conditions have been limited to vestibular sedatives and anti-emetics. This leads to persistent symptoms, over-dependence on the medications, and limitation to the quality-of-life of patients who suffer from dizziness. In order to facilitate the diagnosis and management of patients with dizziness in an accurate and timely manner, the specialized vestibular clinic in Sultan Ahmad Shah Medical Centre @International Islamic University Malaysia (SASMEC @IIUM) was set up in 2019.

Studies have shown that patients suffering from dizziness showed a markedly reduced physical and mental health-related quality-of-life.[4] Therefore, the purpose of this study is to assess the effectiveness of vestibular clinic intervention in improving the perception of dizziness and quality-of-life of patients with dizziness, justifying the time and resources invested in setting up specialised vestibular clinic slots and facilities for objective testing.

MATERIALS AND METHODS

The Vestibular Rehabilitation Benefits Questionnaire (VRBQ) was validated by a group of patients who had undergone vestibular rehabilitation and was found to be sufficiently

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responsive even to small measures of improvement.[5] The Malay translation of the VRBQ, the My-VRBQ; had been validated by Mohtar et al and was found to be internally reliable.[6] The My-VRBQ is a self-reporting questionnaire that consists of 22 questions, divided into part A which focuses on the experienced symptoms (11 questions) and part B which focuses on the effect to the quality-of-life of the patient (11 questions). The questions on symptoms were further subdivided into three subscales, namely; the dizziness (three questions), anxiety (three questions), and motion-provoked dizziness subscales (five questions) to examine the profile of the patient in more detail. There were seven possible responses to each question and these answers correlate with a specific score (0 to 6 for symptoms scores and –6 to 6 for quality-of-life scores).

Patients with complaints of dizziness were selected using universal sampling from the population of patients who attended the Vestibular Clinic in SASMEC @IIUM. Demographic data were gathered from their medical records. All patients were subjected to a holistic approach of meticulous history-taking and complete physical examination in the assessment of patients with dizziness, with an emphasis on otorhinolaryngological, postural blood pressure, cardiovascular, and neurological examinations; complemented by a series of clinical tests like the Dix Hallpike test, Supine roll test, screening for spontaneous nystagmus, head impulse test, head-shake test, oculomotor test, and gait test. Patients were subsequently subjected to an audio-vestibular test battery which includes pure tone audiometry, video head impulse test (vHIT), and video nystagmography test (VNG). Caloric tests, colic-vestibular evoked myogenic potentials (cVEMP), and imaging studies were applied to patients who were indicated for these investigations. After arriving at a diagnosis, the treatment was subsequently tailored to the underlying cause of dizziness. For benign paroxysmal positional vertigo (BPPV), the treatment is by the various canal repositioning manouvres depending on the semicircular canal involved. Vestibular migraine was managed mainly by lifestyle changes which includes dietary control, i.e. avoidance of coffee, chocolates, food with monosodium glutamate; and observing regular sleep, exercise and meal times. Vestibular neuritis was treated with vestibular sedatives like oral prochlorperazine 5 mg when necessary and referral for vestibular rehabilitation. The management of Meniere's disease includes oral betahistine dihydrochloride 24 mg twice daily for 2 weeks with a low-salt and caffeine-free diet. For the other diagnoses which were mostly due to central causes of dizziness, a contrast-enhanced computed tomography scan of the brain and referral to the neurology colleagues for subsequent management were done.

The My-VRBQ were given to patients to be filled after a written consent was obtained during the initial visit, and the post intervention My-VRBQ questionnaire was given at the first follow-up visit at 2 weeks from the initial visit to collect information on the perceptual changes of dizziness and quality-of-life among the patients. There were no dropouts in this study as all patients answered both pre- and post-intervention My-VRBQ questionnaires.

The My-VRBQ scores were subsequently calculated and analysed. Descriptive analysis was performed to examine the scores obtained in the My-VRBQ questionnaire done by the patients before and after vestibular clinic intervention. Statistical analysis was performed to examine the effect of vestibular clinic intervention on the My-VRBQ scores using repeated measures ANOVA. Further analysis was done to examine the relationships between the age, gender, diagnoses, co-morbidities, and the number of visits to the vestibular clinic required to achieve diagnosis among the sample population in relation to the My-VRBQ scores before and after vestibular clinic intervention.

This research was approved by the International Islamic University Malaysia Research Ethics Committee (IREC) with the approval project ID: IREC 2021-109.

RESULTS

A total of 64 samples were obtained among new patients who presented with dizziness and attended the Vestibular Clinic at Sultan Ahmad Shah Medical Centre @IIUM.

The age of the study population ranges from 22 to 80 years old, with a mode of 50 years old, median of 56 years old, and mean age of 53.59 with standard deviation of 14.76. With regards to gender distribution, most of the patients in our study population were females (45, 70.31%) while 19 were males (29.69%).

BPPV remains the most frequent diagnosis encountered with 42 patients (65.63%). This is followed by other diagnoses with eight patients (12.50%), vestibular migraine with seven patients (10.94%), vestibular neuritis with four patients (6.25%), and Meniere's disease with three patients (4.69%). Among the diagnoses encountered in the other diagnoses were other central causes like ischemic stroke (4 patients), acoustic neuroma (1 patient), labyrinthitis (1 patient), and mal de debarquement syndrome (1 patient). Upon running the repeated measure ANOVA analysis, the diagnosis of the patients does not play a significant role in the changes in the My-VRBQ scores before and after receiving care at the vestibular clinic.

A third of the patients in our study do not have any co-morbidities (21 patients, 32.81%). The most associated co-morbidity is hypertension (15 patients, 23.44%), followed by diabetes mellitus (eight patients, 12.50%) and ischaemic heart disease (three patients, 4.69%).

Forty-seven patients in our study were diagnosed within a single visit to the vestibular clinic, equivalent to 73.44%. Another 10 patients required two visits to the vestibular clinic before diagnosis was achieved (15.63%). Only 7 patients (10.94%) required more than two visits to the vestibular clinic before a diagnosis can be achieved.

As shown in Table I and Figure 2, all parts and subscales of the My-VRBQ showed improvement as evidenced by the reduction in scores after patients received care at the vestibular clinic. Among the symptom's subscales, dizziness showed the most improvement as seen by the highest

Table I: Pre- and Post-My-VRBQ scores for each part and subscale of My-VRBQ

Parts and subscales	Pre-My-VRBQ scores				Post-My-VRBQ scores			
	Min	Max	Mean	Standard Deviation	Min	Max	Mean	Standard Deviation
Symptoms	7.60	74.50	41.14	16.01	0	69.92	24.24	17.57
Quality-of-life	0	82.10	20.38	20.13	0	69.90	9.41	14.70
Dizziness	16.68	100.08	54.15	18.96	0	100.08	31.88	23.59
Anxiety	0	66.72	26.50	18.07	0	61.16	18.07	17.41
Motion-provoked dizziness	0	111.2	42.24	25.24	0	80.16	23.75	21.79
Total	12.71	103.97	42.36	19.96	0	106.28	23.35	19.57

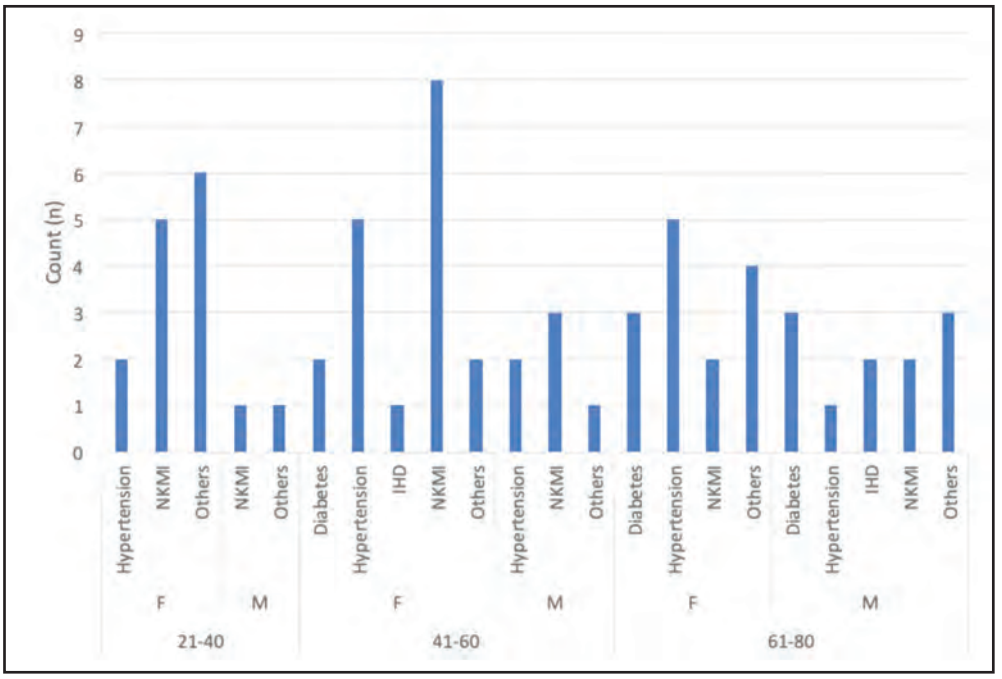

Fig. 1: Patients' age group, gender and co-morbidities. (F = Female, M = Male, NKMI = No known medical illness, IHD = Ischemic heart disease. Others include hyperlipidaemia, bronchial asthma, and stroke)

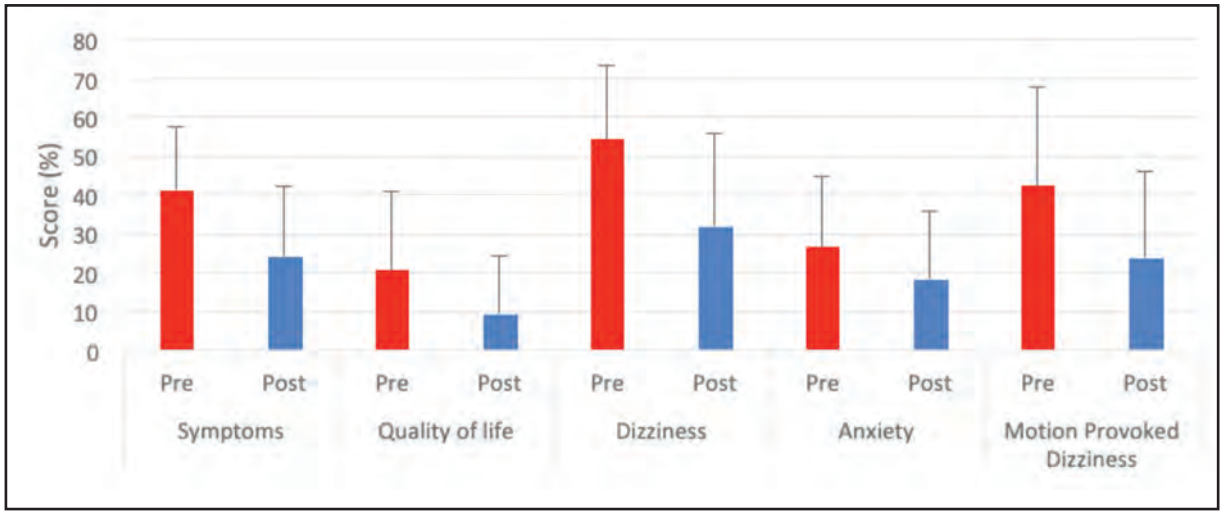

Fig. 2: Pre- and Post-My-VRBQ scores for patients who received care in the vestibular clinic

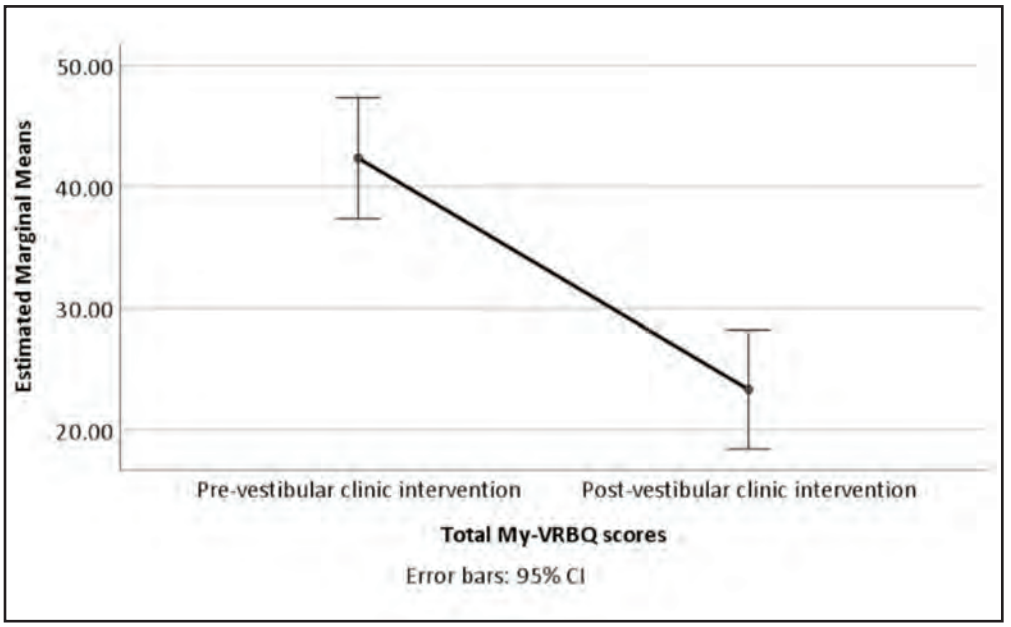

Fig. 3: Effect of vestibular clinic intervention on Total My-VRBQ scores.

reduction in the mean scores. The scores for the sample population before and after vestibular clinic intervention were analysed using repeated measures ANOVA. Mauchly's Test of Sphericity indicated that the assumption of sphericity had been violated, and therefore, a Greenhouse-Geisser correction was used. There was a significant effect of vestibular clinic intervention on symptoms scores where, $F(1,63) = 45.96$, $p<0.05$. With regards to the quality-of-life scores, there was a significant effect of vestibular clinic intervention on quality-of-life scores where, $F(1,63) = 17.01$, $p<0.05$.

Upon analysing the subscales, for the dizziness scores, there was also a significant effect of vestibular clinic intervention on dizziness scores where $F(1,63) = 48.70$, $p<0.05$. Statistical analysis on the anxiety scores also showed a significant effect of vestibular clinic intervention on anxiety scores where $F(1,63) = 15.49$, $p<0.05$. There was also a statistically significant change observed between the age groups on anxiety scores as determined by one-way ANOVA ($F(2,61) = 3.168$, $p = 0.049$). A Tukey post hoc test revealed that the mean change was statistically significant after taking the age group of 41 to 60 years old (3.94 ± 14.43) and comparing them to the 21 to 40 years old group (17.42 ± 20.46). There was no statistically significant difference between the 61 and 80 years old group when compared to 21 to 40 years old and 41 to 60 years old groups.

There was a significant effect of vestibular clinic intervention on motion-provoked dizziness scores where $F(1,63) = 28.21$, $p<0.05$, and on total My-VRBQ scores where, $F(1,63) = 38.65$, $p<0.05$. For the total overall My-VRBQ scores, male patients gained higher mean scores before vestibular clinic intervention (44.38 ± 22.83) while female patients gained higher mean scores after vestibular clinic intervention (24.27 ± 20.12). Applying the independent samples t test, on average, men showed significantly more improvement in total My-VRBQ scores compared to women ($t(62) = -2.85$; $p < 0.05$).

We found no significant effect of the different diagnoses, co-morbidities and number of visits to the vestibular clinic, with vestibular clinic intervention on the changes in My-VRBQ scores.

DISCUSSION

The mean age of our study population is 53.59, and most of our patients (39.06%) were between the age group of 61 to 80 years old. This corresponds to a Turkish validation study of the VRBQ questionnaire in which the mean age of the sample population is 47.33 ± 12.18 years.[7] Closer to our centre, a study in a tertiary hospital in Malaysia reported that about 88% of patients in their study were above the age of 40 with the mean age among males 53.1 years old and females 51.6 years old.[1] The results of our study showed that there was a significant association between the age of patients with vestibular clinic intervention on the anxiety scores changes, particularly when comparing between 21 and 40 years old age group and 41 to 60 years old age group. Before vestibular clinic intervention, the mean anxiety score was the highest among the 21 to 40 years old group (34.84 ± 12.86), followed by 41 to 60 years old group (26.87 ± 19.51) and 61 to 80 years old group (21.13 ± 17.94). A study in Germany concurs that anxiety about bodily sensations was found to be higher in younger patients than in older patients.[8]

With regards to gender, 70.3% of the study population were females while 29.7% were males, resulting in the ratio for male to female of 1:2.37. This roughly corresponds to a study in a Multidisciplinary Dizziness Clinic in Canada which reported that 66.4% of the patients were females and 33.6% were males.[9] In Malaysia, a study in a tertiary centre also reported predominantly female patients, accounting for 62.4% of the total patients.[10] However, our study showed that men had significantly more improvement in total My-VRBQ scores compared to women.

BPPV is the most prevalent diagnosis among these patients, accounting for 65.63% of the patients, followed by vestibular migraine (10.94%). This corresponds to that reported in another study, which states that the prevalence of BPPV is about 17 to 42% among patients with vertiginous symptoms.[11] A study in the UK reported that vestibular migraine was the second most common cause of vertigo with a lifetime prevalence of 3.2% in the general population.[12] In Malaysia, a study in a tertiary centre showed that BPPV was the most prevalent diagnosis, followed by Meniere's disease.[10] We concur with the study in Switzerland which showed that specialized neuro-otological assessment was able to help in the diagnosis of balance disorders; in particular, BPPV and vestibular migraine which were frequently under-diagnosed.[13] For the total overall my-VRBQ scores prior to vestibular clinic intervention, patients with vestibular neuritis experienced the worst symptoms and effect on their quality-of-life as their mean score was the highest (48.52 ± 19.94).

The United States National Health & Nutrition Examination Survey found that there were significant associations between the prevalence of vestibular dysfunction by cardiovascular risk characteristics. Heavy tobacco use (20 pack-years and more), hypertension, and diabetes were associated with higher rates of vestibular dysfunction.[14] In our study, 23.44% of patients had hypertension, 12.50% of patients had diabetes mellitus, and another 4.69% had ischemic heart disease. Patients with ischemic heart disease had the highest total overall my-VRBQ scores before (44.86 ± 31.53) and after (46.28 ± 30.51) vestibular clinic intervention. This finding was consistent with a report in the United States of America which concluded that 63% of patients with primary cardiovascular disorders experienced vertigo.[15] However, our inferential analysis revealed that the co-morbidities of the patients do not play a significant role in the changes in the My-VRBQ scores before and after vestibular clinic intervention. In fact, some patients' symptoms worsened despite receiving care from vestibular clinic. This was most likely due to the symptoms of dizziness being confounded by both the primary diagnosis and the co-morbidity of ischemic heart disease. In our study, one patient with underlying ischaemic heart disease with the diagnosis of BPPV showed an improvement in the total My-VRBQ score by 24.26 (pre-vestibular clinic intervention score of 77.40 and post-vestibular clinic intervention score of 53.14, 31.34% improvement), while another patient with underlying ischaemic heart disease with the diagnosis of vestibular migraine showed worsening of the total My-VRBQ score by 30.04 (pre-vestibular clinic intervention score of 42.74 and post-vestibular clinic intervention score of 72.78, worsening by 70.27%). While there is an association between migraine and ischaemic heart disease,[16] there is no published papers yet on the association between vestibular migraine and ischaemic heart disease which may explain the worsening of the total My-VRBQ score in this patient, compared to the patient with ischaemic heart disease and BPPV. Therefore, there is a need to evaluate the potential changes in the My-VRBQ scores among patients with co-morbidities on a case-to-case basis.

Most patients in our study required only one visit to the vestibular clinic to achieve their diagnosis (73.44%). It was not surprising that patients who required more than two visits to the vestibular clinic prior to achieving diagnosis had the highest mean of the total My-VRBQ scores before vestibular clinic intervention at 43.84 ± 21.31 while the patients who required a single visit to the vestibular clinic prior to achieving diagnosis had the lowest mean of the total My-VRBQ scores at 41.91 ± 20.36. There were no studies which analysed the number of visits required to achieve a diagnosis, but we published a paper from our clinic which revealed that 79% of patients who attended the vestibular clinic required only one visit before a diagnosis can be made, which is consistent with our current findings.[17]

CONCLUSION

Based on our observation, there was a positive effect of vestibular clinic intervention on the symptoms and quality-of-life of patients as evidenced by statistically significant improvements seen in all of the parts and subscales of the My-VRBQ questionnaire. Therefore, more dedicated vestibular clinics should be set up in Otorhinolaryngology departments to assist in the diagnosis and management of patients who present with dizziness. We recommend a vestibular clinic set-up which includes meticulous history taking and complete physical examination; complemented by a series of clinical tests like the Dix Hallpike test, Supine roll test, screening for spontaneous nystagmus, head impulse test, head-shake test, oculomotor test, gait test; and at least a basic audio-vestibular test battery which includes pure tone audiometry, vHIT, and VNG. We trust that this set-up will be able to benefit patients in terms of improvements in symptoms of dizziness and their overall quality-of-life.

CONFLICT OF INTEREST

The authors declare that there is no conflict of interest with regards to the publication of this article.

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