

Vertigo: A single Institutional Experience

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Abstract

Background: Vertigo is an illusion or hallucination of movement, often horizontal and rotatory, either of oneself or the environment. The type is either central or peripheral, but sometimes it cannot be identified.

Objective: We analyzed the etiologies of peripheral and central vertigo in our patients.

Patients and Methods: The cross-sectional observational study enrolled 100 patients consecutively, who had attended the Rizgary Teaching Hospital's neurology outpatients' clinic in Erbil, Iraq, from January 1, 2019, to October 31, 2019. Thorough history, full general and neurological examinations and an extensive battery of investigations (including cranial contrast MRI) were performed. Patients with peripheral vestibulopathy and vertigo were assessed by otolaryngologists.

Results: Females (69%) outnumbered males (31%). Patients in their 6th decade were the commonest target; the mean age was 46.7 years. Peripheral vertigo was evident in 46% of the patients while central vertigo occurred in 36% of them. In 18% of the patients, no cause was identified; most of them were females (88.8%) in their 7th decade of age. Benign paroxysmal positional vertigo (BPPV) dominated the peripheral vertigo cases. The most prevalent cause of central vertigo was vertebrobasilar insufficiency (VBI) (27%); many were above 50 years of age.

Conclusion: Peripheral vertigo was more prevalent than the central ones. BPPV and VBI were the commonest causes of vertigo, in general. Vertigo mainly targeted middle-aged individuals in our city.

Keywords: Vertigo, Vestibulopathy, Vertebrobasilar insufficiency, Benign paroxysmal positional vertigo.

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Introduction

Vertigo is defined as an illusion or hallucination of movement, often horizontal and rotatory, either of oneself or the environment. Associated nausea and vomiting suggest a peripheral rather than central

cause[1-3]. Symptoms of vertigo account for 10.7 visits per 1000 persons per years in general practice morbidity statistics [4]. A thorough history and physical examination usually differentiate between genuine vertigo

from pseudo-vertigo in patients who have been experiencing dizziness or lightheadedness. This results from lesions of the visual, somatosensory, or vestibular systems. Visual vertigo is caused by new or incorrect spectacles or by the sudden onset of an extraocular muscle paresis with diplopia; in either instance, CNS compensation rapidly counteracts the vertigo. Somatosensory vertigo, rare in isolation, is usually due to a peripheral neuropathy or myelopathy that reduces the sensory input necessary for central compensation when there is dysfunction of the vestibular or visual systems. The most common cause of pathologic vertigo is vestibular dysfunction involving its end organ (labyrinth), nerve, or central connections[4,5].

Patients and Methods

This cross-sectional observational study enrolled 100 patients consecutively, who had attended the Rizgary Teaching Hospital's neurology outpatients' clinic in Erbil, Iraq, from January 1, 2019, to October 31, 2019. Both genders were included, and their ages ranged from 11 to 77 years. Thorough history was taken and only patients with true vertigo were included, and full general and neurological examinations (including rapid head impulse test and Dix-Hallpike maneuvers) were performed by neurologists and neurology trainees. Rapid head impulse test and Dix-Hallpike maneuvers were conducted by neurologists and neurology trainees, according to their standards[5].

Complete blood counts, erythrocyte sedimentation rate, blood urea and serum electrolytes, blood glucose, serum lipids, liver function tests, and TSH were obtained in all patients. Electroencephalography (EEG) and cranial magnetic resonance imaging (MRI) were done in patients who have been suspected of having vertiginous migraine or seizures. Radiological tests like x-ray of mastoids, cervical spines, CT scan and MRI of head were done when required, according to the clinical presentation and findings. Brain CT scan and/or MRI were also ordered when a central cause was suspected (2 patients had cranial CT scan and 72 patients had cranial MRI). The rest of patients (n=26) were not examined by cranial CT scan or MRI, as the causes of vertigo were obvious.

Patients with vertigo of peripheral origin were selected and sent to otolaryngologists for further evaluation. Follow-up consisted of direct telephone contact with each patient to evaluate response to treatment and set appointments for regular visits. Contact also occurred on a regular basis over the study period in order to re-evaluate the response after completing the investigation or after having performed the otolaryngologists' consultation.

Statistical analysis

Data were analyzed by an independent statistician using the statistical package for social sciences (SPSS), version 21.0.

Results

There was a female preponderance with a female to male ratio of 2.2: 1 (there were 69

females and 31 males). Their ages ranged from 11 to 77 years. The mean age was 46.7 years and the peak occurrence of vertigo was in the 6th decade Table (1).

Table (1): Gender and age distribution (n=100)

Age (year)	Male	Female	Total number and percentage (%)
0-10	0	0	0
11_20	5	1	6
21-30	3	12	15
31-40	8	12	20
41-50	5	8	13
51-60	4	18	22
60-70	4	15	19
70-77	2	3	5
TOTAL	31	69	100

Table (2) demonstrates the types of vertigo; central, peripheral, and unidentified. The incidence of peripheral vertigo was more than central one, with mean ages of 52.7 years and 39.5 years respectively.

Table (2): Types of vertigo in both genders (n=100)

VERTIGO TYPE	Males	Females	TOTAL
Peripheral	18	28	46
Central	12	24	36
Unidentified	2	16	18

Table (3) shows the causes of vertigo. The commonest cause was VBI (n=27) while the least etiology was multiple sclerosis and vestibular schwannoma (one patient for both).

Table (3): Causes of vertigo (n=100)

Causes	Number of patients
VBI	27
BPPV	25
Unknown	18
Vestibular Neuritis	15
Vertiginous Migraine	5
Meniere's disease	5
Epilepsy	3
Multiple sclerosis	1
Vestibular Schwannoma	1
TOTAL	100

* VBI, vertebrobasilar insufficiency; BPPV, benign paroxysmal positional vertigo

Table (4) shows gender distribution of vertigo due to VBI. Most patients were in their 5th and 6th decades of life. More than 85% of those patients were above the age of 50 years.

Table (4): Age distribution of vertigo due to vertebrobasilar insufficiency (n=27)

Age (year)	Number of patients
0-10	0
11_20	0
21-30	1
31-40	2
41-50	1
51-60	10
60-70	9
70-77	4
TOTAL	27

Table (5) shows vertigo due to unidentified causes, which consisted of 18 patients (18%). The peak incidence was in the 7th decade of life.

Table (5): Unidentified causes (n=18)

Age (year)	Number of patients
0-10	0
11_20	1
21-30	3
31-40	0
41-50	1
51-60	4
61-70	8
71-77	1
TOTAL	18

Discussion

Several mechanisms are responsible for the maintenance of a balanced posture and for awareness of the position of the body in relation to its surroundings. The most important of the afferent impulses (which inform us of the position of different parts of the body, in response to these impulses, the adaptive movements necessary to maintain equilibrium are carried out) are the following:

1. Visual impulses from the retinae and possibly proprioceptive ones from the ocular muscles, which enable us to judge the distance of objects from the body.
2. Impulses from the labyrinths, which function as highly specialized spatial proprioceptors and register changes in the velocity of motion (either acceleration or deceleration) and position of the body.

3. Impulses from the proprioceptors of the joints and muscles are essential to all reflex, postural, and volitional movements.

The sense organs listed above relate to the cerebellum and with certain ganglionic centers and pathways in the brainstem, particularly the vestibular nuclei, and, via the medial longitudinal fasciculi, with the ocular motor nuclei. Old people may lose their balance on extending the neck, and their peripheral sensory afferents are often impaired, as are the protective postural mechanisms, making falls more frequent[5].

Differentiating genuine vertigo from pseudo-vertigo is critical. On the other hand, differentiating episodes of physiological vertigo from pathological vertigo is important in managing and treating such patients. Genuine vertigo should be classified as central or peripheral vestibulopathy, as the diagnostic approach is quite different. In addition, differentiating vertigo from other causes of lightheadedness or dizziness should not be forgotten[5-12]. Some investigations can confidently diagnose the etiology of vertigo and its site[13,14].

Peripheral vertigo is the most common type of true vertigo [14]. BPPV is the most common cause of vertigo in adults [15, 16]. In general, BPPV together with acute vestibular neuritis, and Ménière's disease cause most cases of vertigo; bedside test can help physician with this regard[17,18]. The use of cranial MRI in the diagnostic workup of vertigo is not a routine one. It depends on the symptomatology of the patient and his/her clinical findings[19].

Vertigo is a common symptom, which may be highly disabling. It should be kept in mind that vertigo ranks 2nd on the list of reasons of visiting emergency rooms, neurologists, and otolaryngologists. Most patients can be diagnosed and managed on outpatients' basis, with a good clinical outcome[20].

In our 100 cases, the gender difference was visible; females (69%) were more than males (31%). This is consistent with a study by Min Yin et al in Japan [21] and a study by Marina Titlic et al in Croatia [22]. About 89% of the cases were between 21 to 70 years of age, and the peak incidence of vertigo was in the 6th decade of life; this is comparable to Marina Titlic et al study [22]. The mean of the age of patients was 46.7 years.

The disease was less common below 20 years and above 70 years of age. A study by Debasish Burman et al showed that about 92.6% of their cases were between 21-60 years of age, and that the disease was less common above the age of 50 years and was rare below 20 years of age[23].

We found that peripheral vertigo was more common than central one, and this is consistent with the Min Yin et al study [21]. In our study, no clear cause was found (the cause was unidentified) in 18% of cases; this result is also consistent with the Min Yin et al study [21]. Lee H and colleagues studied prospectively 72 cases of vertigo of unknown cause and attributed some of them to migraine; their results suggested that migraine should be considered in the differential diagnosis of isolated recurrent vertigo of unknown cause[24]. The mean age

of patients with central vertigo was 52.7 years and was more than that of peripheral vertigo (39.5 years); this indicates that compared to younger patients, elderly patients have a high tendency of developing central vertigo [21]; this is probably because of the higher rate of atherosclerotic changes and more degenerative changes of cervical spine which is basis for VBI (25-27). This result is comparable with the Marina Titlic et al study [22].

The most common cause of vertigo in our study was VBI (27%), comparable to the Marina Titlic et al study (36.5%) [22], followed by BPPV. This is because our patients were collected in the only available neurology department in the whole governorate, where all neurological cases are referred to. Most patients were in their 5th and 6th decades of life. More than 85% of those patients were above the age of 50 years, because older age is a recognized risk factor for atherosclerosis and VBI [6].

Conclusions

Peripheral vertigo was more prevalent than central ones. BPPV and VBI were the commonest causes of vertigo, in general. Vertigo mainly targeted middle-aged individuals, mostly females, in our city.

Recommendations

The presence of vertigo in middle-aged individuals should always prompt the physician search for a central cause, at first, which may be disabling or life-threatening. Peripheral vertigo is better to be assessed by otolaryngologists.

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