

Clinical Characteristic of Vertigo in Children

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ABSTRACT

Objective: To review the clinical characteristic of vertigo in children

Method: A retrospective observational study was done on children who presented to a specialised vertigo clinic over period of six years. The patients' case notes were retrieved from the medical record unit and reviewed. All patients were seen by an otologist who thoroughly took down history, completed ear, nose, throat and neurological examination.

Result: Seven different causes were identified in 21 patients (86%) while no diagnosis was reached in three patients (12.5%). The most common cause of giddiness was childhood paroxysmal vertigo (33%) followed by benign paroxysmal positional vertigo (16.6%) and sensorineural hearing loss (12.5%). Other causes include chronic suppurative otitis media and anxiety disorder each accounting for 8.3%, one case of cholesteatoma and another case of ear wax each accounting for 4.1%.

Conclusion: It is not uncommon for the children to be affected by vertigo. Management of vertigo in children should include a detailed history, clinical examination, audiological and neurological evaluation. Imaging should be performed in selected patients. The main cause of vertigo in our series is CPV. The outcome of most of the patients is good.

KEY WORDS:

Vertigo; children

INTRODUCTION

Dizziness is a feeling of light headiness, unsteady, giddy or feeling of floating sensation. According to American Otolaryngology and Head and Neck Surgery Association, vertigo is a specific kind of dizziness expressed as an illusion of movement of oneself or the environment.¹ The exact worldwide or regional incidence of vertigo in children is very difficult to ascertain because of paucity of studies on the topic.

Vertigo generally is classified as peripheral or central-type based on the causes. Peripheral vertigo mainly arises from ear and has predominantly ear symptoms with no or few central symptoms. Philip and Prepageran found 64.7% of 100 patients attending a tertiary neurology clinic in Malaysia were having peripheral vestibular disorder.² Central vertigo originated from central nervous system. It may have motor,

sensory symptoms and sometimes associated with aura and visual symptoms.

Vestibular disorder recognition in children can be quite challenging because of their inability to fully describe the presenting symptoms well. Their immature anatomical structures may give a false impression on presenting symptoms. The parents should play an important role in the provision of supplementary information that will be useful in reaching the diagnosis. During evaluation it is important to thoroughly investigate developmental profile fully, starting from pregnancy history, perinatal history and milestone development. The incidence of dizziness among children in the United Kingdom is 5.7%.³ Niemnensivu et al. found an incidence of 8% among 938 children he studied in Finland.⁴ Well-developed vestibular system is necessary for movement tolerance, control of postural alignment and vision. Sensory information on motion and spatial orientation are generated from the vestibular end organ of ear located in the semicircular canal, utricle and saccule. Impairment of function of the vestibular end organ may lead to vestibular dysfunctions which may be manifested as vertigo with or without associated symptoms.

Differential diagnosis of vertigo in children is divided into peripheral, central and others. Peripheral vertigo includes benign paroxysmal positional vertigo (BPPV), congenital deafness, immune mediated ear disease, infectious disease, post meningitis while central causes include childhood paroxysmal vertigo (CPV), chiari malformation, cerebrovascular accident, hereditary ataxia, head trauma, multiple sclerosis.⁵ The aim of this study is to review the clinical characteristic of vertigo in children.

MATERIALS AND METHODS

This is a retrospective observational study. The study group consists of 24 patients (12 males and 12 females) between 5-18 years of age who visited the Vertigo Clinic at Hospital Universiti Sains Malaysia from 2007 to 2013. The patients' case notes were retrieved from the medical record unit and reviewed. All patients were seen by an Otologist who thoroughly took down history, completed ear, nose, throat examination and neurological examination. The following information was noted on presentation: symptoms and their duration, associated symptoms, examination findings, pure audiometry, tympanometry. Occasionally further laboratory test like serology, videonystagmography, CT scan brain and temporal were requested but few will be needed in order to

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Table I: Patients main presenting complains

Presenting complain	Number of patients	Percentage
Giddiness	12	50
Decrease of Hearing	3	12.5
Ear Bleeding	3	12.5
Ear discharge	2	8.3
Syncopal Attack	2	8.3
Frontal headache	1	4.1
Ear blockage	1	4.1

Table II: Patients associated symptoms

Associated symptoms	Number of patients	Percentage
Nausea and Vomiting	4	16.6
Headache	4	16.6
Tinnitus	4	16.6
Decrease of Hearing	3	12.5
Palpitation and Sweating	2	8.3
Photophobia	1	4.1
Ear bleeding	2	8.3
No associated symptoms	4	16.6

Table III: Patients' diagnoses

Diagnoses	Number of Patients	Percentage
Childhood Paroxysmal Vertigo	8	33
Benign Paroxysmal Positional Vertigo	4	16.6
Sensory Neural Hearing loss	3	12.5
Chronic suppurative Otitis media	2	8.3
Anxiety Disorder	2	8.3
Ear Wax	1	4.1
Cholesteatoma	1	4.1
No Diagnosis	3	12.5

have a definitive diagnosis. Once diagnosed, patient were treated and followed up accordingly.

RESULTS

Main presenting complaint (Table I) was giddiness which patients described as spinning or floating sensation, seen in 50% (n=12) with a varied duration between 1 day to 2 years. It is followed by decrease in hearing and ear bleeding, seen in 12.5% (n=3) with duration of symptoms varying from weeks to years. Syncopal attack and ear discharge account for 8.3 % (n=2) each with duration of symptoms varying from weeks to months. Frontal headache and ear blockage accounted for 4.1% (n=1) with duration of 1 week to a year.

Nausea, vomiting, headache and tinnitus were the most common associated symptoms in 16.6% (Table II), followed by decrease in hearing (12.5%) ear bleeding and palpitation in for 8.3% respectively. Photophobia as associated symptoms was found in 4.1%. 16.6% of patients did not have any associated symptoms.

On initial diagnosis (Table III) the most common cause of giddiness was childhood paroxysmal vertigo in (n=8), followed by benign paroxysmal positional vertigo in (n=4). Sensory neural hearing loss was seen in 3 patients. Chronic suppurative otitis media and anxiety disorder were less common. One case of cholesteatoma and another case of ear wax were seen diagnosed. No diagnosis was reached on three cases.

On further evaluation two diagnoses were changed from childhood paroxysmal vertigo to psychosomatic disorder and a case of benign paroxysmal positional vertigo was changed to panic disorder.

DISCUSSION

Twenty four patients from all the patients attending the vertigo clinic in six year duration were analysed. The total number of patient is a small as compared to other studies; most probably some of the patients were seen and treated by paediatrician or paediatric neurologist in their respective clinics. Other possibilities are the patients were misdiagnosed, under-diagnosed or failed to reach our specialised clinic. Seven different causes were identified from this series which account for 86.2% of total patient seen; no diagnosis was reached in three patients.

Childhood paroxysmal vertigo (CPV) was the most common diagnosis seen in this series. Childhood paroxysmal vertigo is also known as benign paroxysmal vertigo of childhood (BPVC). CPV is considered a centrally originated pathology in the spectrum of migraine disease.⁶ CPV is characterised by brief attacks of spinning vertigo, nystagmus, nausea and vomiting in absence of provoking factors. Patients are often sensitive to motion, light and sound, and relieved by sleeping.⁷ Children tend to grow out of CPV, however sometime CPV progresses with migraine-associated vertigo in adulthood.^{7,8} CPV in childhood is considered as a migraine equivalent.^{9,10,11} The treatment for CPV is scarce or non-

existing in English literature. Most of the children with CPV are treated with anti-migraine medication.

In general, vertigo in children differs from that in adults because of few main reasons. Firstly, vestibular disorders are often ignored in children, because vertiginous manifestations are usually attributed to lack of coordination or behavioural problems. Secondly, as children often lack the communication ability to describe accurately their symptoms, diagnosis is based less on history and much more in clinical examination and laboratory investigations. Thirdly, although most diseases that cause vertigo in adulthood occur in childhood as well, their frequency may be different, depending on the age of the patient and their signs and symptoms may not be identical.^{12,13} Finally, children require different approaches to testing where fear and age-appropriate needs are considered, and the results of these tests must be adjusted for a younger population to be fully reliable.¹⁴

Benign paroxysmal positional vertigo (BPPV) was the second most common diagnosis seen in this study which account for 16.6%. BPPV is the commonest labyrinthopathy in adult with vertigo, however BPPV is rare in children.¹⁵ Choi SJ *et al.* found only seven (4.5%) out of 154 children shown a typical BPPV, and Balatsouras DG *et al.* only 4 (7.3%) out of 54 children.^{12,16} Benign paroxysmal positional vertigo (BPPV) is not the same as CPV. BPPV is a condition caused by dislodged of otoconia into the semicircular canals or stuck at the cupula which later on stimulate the hair cells and resulting in vertiginous feeling. Our BPPV patients were successfully treated by the modified Epley canalith repositioning procedure. The high percentage of BPPV may be due to limited number of patients in this series.

Third most common cause was sensory neural hearing loss which accounts for 12.5%. Sensorineural hearing loss itself is not a diagnosis. It is a finding in patients who have a normal ear drum and no other leads to suggest the cause of sensorineural loss. Other cause includes; chronic suppurative otitis media 8.3%, and anxiety disorder 8.3%. Cholesteatoma and ear wax were less common. Three diagnoses were changed after re-evaluation; this may be due to coexisting of underlying disorders masked by vestibular symptoms and not diagnosed early-on, before patients presented to our vertigo clinic.

Vertigo in otitis media probably resulted from serous labyrinthitis, a sterile inflammation secondary to exposure to toxic materials that cross the round window membrane or the oval window annulus.¹⁷ Vertigo in patient with cholesteatoma and ear wax can be due to disturbance of patency of external auditory canal, Eustachian tube and sometimes inner ear function.

Although stomachache and headache are considered characteristic of children with anxiety disorders, there is evidence that a broader range of somatic symptoms may be associated with children's expressions of anxiety.¹⁸ Last CG reported symptom of dizziness in 25% of 158 children and adolescents specifically referred to a specialty anxiety disorders clinic.¹⁹ It is believed that the psychosomatic effects

in an anxious person cause dizziness. Anxiety or hyperventilation may also reactivate a vestibular disorder by interfering with central compensation or by altering somatosensory input.²⁰

Nausea and vomiting, headache and tinnitus were the most common associated symptoms identified in this study. Followed by decreased in hearing and ear bleeding and palpitation account. Photophobia as associated symptoms was found in 4.1% of patient. No associated symptoms were found in 16.6% of patients. A similar finding was seen in the study by Gruber *et al.* albeit a bit higher in percentage.²¹

In this study we found that most patients complained of giddiness in the afternoon while coming back from school, this may be due to stress they are exposed to. Some of these patients we study have been enduring their symptoms for years before they were seen by primary physician who referred them to the appropriate specialist. Occurrence of anxiety disorder in some of our patients may be due to aftermath of CPV and BPPV.

Other categories of patients were treated based on the underlying caused. Most patients maintained on regular follow up but some requested appointment on recurrence of their symptoms.

CONCLUSION

It is not uncommon for the children to be affected by vertigo. Management of vertigo in children should include a detailed history, clinical examination, audiological and neurological evaluation. Imaging should be performed in selected cases. The main cause of vertigo in our series is CPV. The outcome of most of the patients is good.

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