



# Vestibular Disorders in Children and Teenager.

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## ABSTRACT

**Objective:** To assess diagnosis and therapeutic aspects in an Otolaryngology Child Ambulatory. **Methods:** Retrospective study, type series of cases, review of medical charts from patients attended from 2006 to 2011. Social, demographic and clinical variables, the supplementary exam results, the treatment used and the clinical evolution were assessed. **Results:** Eighty-eight patients were included in age average of 9,87 years, 52,27% of which of the female gender. The most prevalent diagnosis was the benign paroxysmal vertigo of childhood (BPVC), in 54,54% of cases, followed by the vestibular metabolic syndrome in 23,86%, and the vestibular migraine in 11,36% of cases. The majority of patients show inadequate eating habits (77,27%) and 54,54% of patients complained about dizziness. In 34,09% of cases there was improvement with dietetic orientation and vestibule rehabilitation. **Conclusion:** There was predominance of IBPV diagnosis, its narrow relation to personal and family records of migraine and its benign character of evolution. It was also observed the importance of the monitoring, of dietetic orientation and the role of vestibular rehabilitation in childhood and adolescence vestibulopathy.

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## INTRODUCTION

Dizziness is defined as a misperception of motion caused by abnormalities in the interaction between the visual, vestibular or proprioceptive<sup>1</sup>. Vestibular dysfunction in children usually affects communication skills, psychological status and performance escolar<sup>2-6</sup>. Vertigo in children presents three major challenges. First, vestibular disorders in children are usually ignored because manifestations related to loss of body balance are usually attributed to lack of coordination or changes comportamentais<sup>2</sup>. Second, as children have difficulty expressing their symptoms<sup>3</sup>, the diagnosis may depend mainly on clinical and laboratory research comprehensive and multidisciplinary. Third, although most diseases that cause dizziness in adults also can affect children, the most prevalent causes aged children are diferentes<sup>5</sup>. The most prevalent causes of vertigo in children and adolescents are benign paroxysmal vertigo of childhood (BPVC), serous otitis media, head injury, malformation of the inner ear, vestibular migraine, visual disturbances, vestibular neuritis, labyrinthitis infectious fossa tumor and posterior<sup>1-6</sup>, 8-13. Aim of this study was to evaluate diagnostic and therapeutic aspects in a child outpatient Neurotology.

## METHODS

A retrospective study, conducted by analysis of all charts of outpatient clinic patients of pediatric Neurotology 2006 to 2011. We excluded patients who did not have complete records. Data were analyzed with respect to age, gender, clinical diagnosis and association diagnostics, dietary habits, vestibular symptoms, auditory symptoms, personal history of headache and motion sickness, findings of laboratory tests (electronystagmography (ENG), and impedance audiometry, computed tomography (CT)/temporal bone magnetic resonance imaging (MRI) brain/inner ears and laboratory tests), family history of headache, dizziness, hearing loss and diabetes mellitus, time to disease progression, treatment performed and clinical outcome. Patients were grouped according to the clinical diagnosis in a group of patients with BPVC and vestibular migraine (VM), and another patient with a diagnosis other than BPVC and VM. Were made associations between the presence or absence of headache complaint, family history of migraine and the presence of motion sickness among groups. Data were analyzed and the association between the data was performed using the chi square test.

## RESULTS

We evaluated 94 records, 6 and 88 were excluded eligible for inclusion in this study. Were aged between 3 and 16 years, an average of 9.87 years (SD 3.19). Of these, 46 (52.27%) were female. In Table 1 are found more diagnoses. In Tables 2-5, there is, respectively, the prevalence of complaints of headache, presence of family history of migraine and the presence of motion sickness in those patients diagnosed with VPBI and MV compared to other patients with other diagnoses. Poor eating habits were reported by 68 patients (77.27%) with a predominance of daily intake of sweets (57.95%). The majority 48 (54.54%) complained of vertigo. Non-rotation dizziness was reported by 37 patients (42.04%). The ENG presented with normal standard in 41.51% of patients, 3.77% had to be compatible with central vestibular syndrome and in 54.72% of patients with type Peripheral Vestibular Syndrome. In 30 cases (34.09%) had improved with dietary counseling and vestibular rehabilitation. With dietary counseling alone yielded improvement in 18 patients (20.45%), and the association of diet and prescription medication was successful in 9 cases (10.23%), 2 patients underwent tympanostomy tube placement for ventilation and Epley maneuver was performed in 1 patient. One patient was referred for hearing aids, 3 patients for evaluation and monitoring of neurology e1 case for genetic evaluation.

## RESULTS

Chart 1. Prevalence of vestibular disorders in the number of children studied according to patient age at diagnosis (n = 88).

Diagnosis	Number of children/years																Total
	3	4	5	6	7	8	9	10	11	12	13	14	15	16			
BPVC	2,00	4,00	4,00	3,00	5,00	3,00	3,00	7,00	5,00	5,00	2,00	3,00				48,00	
metabolic	1,00			1,00	2,00	1,00	4,00	2,00	3,00	3,00	1,00	2,00	1,00			21,00	
VM				1,00	3,00	1,00	1,00	1,00	2,00		2,00					10,00	
Motion sickness			1,00			1,00		3,00					1,00			7,00	
Serous Otitis Media	1,00		2,00				2,00									5,00	
Central	1,00			1,00			2,00									4,00	
Hydrops					1,00	1,00		1,00								3,00	
Diaautonomia										1,00	1,00	1,00				3,00	
BPV	1,00								1,00		1,00					3,00	
Ménière Disease												2,00				2,00	
Unknown cause	1,00	2,00	3,00			1,00	1,00	1,00		1,00						10,00	
BPVC - benign paroxysmal vertigo of childhood																	
BPV - Benign Posicional Paroxistic Vertigo																	

Table 2. Prevalence of complaints of headache between the group of patients with benign paroxysmal vertigo of childhood and vestibular migraine and the group of patients with other diagnoses vestibular.

	Headache		Total
	Yes	No	
BPVC/VM	43 (74,1%)	15 (25,9%)	58 (100%)
Another Diagnosis	13 (43,3%)	17 (56,7%)	30 (100%)
Total	56 (63,63%)	32 (36,36%)	88 (100%)

BPVC - benign paroxysmal vertigo of childhood  
VM - Vestibular migraine  
p=0,004

Table 3. Prevalence of family history of migraine among the group of patients with benign paroxysmal vertigo of childhood and vestibular migraine and vestibular group with other diagnoses.

	Migraine family history		Total
	Yes	No	
BPVC/VM	44 (75,9%)	14 (24,1%)	58 (100%)
Another Diagnosis	7 (23,3%)	23 (76,7%)	30 (100%)
Total	51 (57,95%)	37 (42,05%)	88 (100%)

BPVC - benign paroxysmal vertigo of childhood  
VM - Vestibular migraine  
p<0,001

Table 4. Prevalence of motion sickness among the group of patients with benign paroxysmal vertigo of childhood and vestibular migraine and vestibular group with other diagnoses.

	Motion sickness		Total
	Yes	No	
BPVC /VM	35 (60,3%)	23 (39,7%)	58 (100%)
Another Diagnosis	16 (53,3%)	14 (46,7%)	30 (100%)
Total	50 (56,81%)	44 (43,18%)	88 (100%)

BPVC - benign paroxysmal vertigo of childhood  
VM - Vestibular migraine  
p=0,528

## DISCUSSION

The prevalence of vestibular disorders in childhood ranges from 0.4% to 6.11%<sup>15</sup>. The average age described ranges 7-11 years<sup>5</sup>. In the present study we observe average age of 9.87 years. It was observed that the BPVC already starts in pre-school age while the vestibular migraine presents in most cases in school children as described by Niemensivu et al<sup>8</sup> and Ralli et al<sup>9</sup>. The BPVC is considered the precursor of migrânea<sup>6</sup>, 8,9,11,13, and well differentiated from positional vertigo, as this is rare in children<sup>13</sup>. For some authors as Sanz et al<sup>3</sup> migraine is a clinical feature that most distinguishes groups of pediatric and adult patients. The prevalence of family history of migraine in this study was 62.50% when considering all patients in the group with VPBI 82.98% in some series show variation in prevalence 55-90%<sup>3,6,9</sup>.

We observed an association of diagnosis of motion sickness in most cases. Sanz et al mention motion sickness as a trigger for migraine. Even knowing that the diagnosis of vestibular clinical notes is the importance of ENG aid to diagnosis, especially in helping the central causes of exclusion and characterization of the vestibular disorder found. Souza et al<sup>2</sup> found the ENG altered in 86.7%, Szirmai in 81%<sup>13</sup>. Most of these authors advocate the routine use of ENG.

## DISCUSSION

Regarding eating habits, in 68 (77,27%) were inadequate. We found few studies describing the metabolic syndrome in childhood and its relationship to diet. Family history of headache, dizziness, hearing loss or diabetes mellitus were present in 65 (73.86%) patients, with a prevalence of history of migraine (84.61%) supported by the study of Abu-Arafeh et al<sup>11</sup>. In 30 cases (43.47%) had improved with dietary counseling and vestibular rehabilitation. Followed by dietary counseling alone and the combination of diet and medication use as flunarizine and valproic acid. It was noted in this study the importance of dietary counseling for all patients.

## CONCLUSIONS

The profile of ambulatory child Neurotology analyzed proved to be mostly composed of children diagnosed with BPVC in school period, female or male complaining of vertigo, with episodes of headache, family history of migraine, with poor eating habits, without changes to the audiometric evaluation and electronystagmographic. The majority of these patients improve only with dietary counseling, and in many cases benefited from association with vestibular rehabilitation exercises.

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