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Original article

Vertigo in childhood: A retrospective series of 100 children

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ABSTRACT

Objective: Evaluation and management of vertigo in children vary between institutions and medical specialties. The aim of this study is to describe the characteristics of vertigo in children presenting to a pediatric neurology referral center and to investigate the relationship between vertigo and migraine.

Study design: Patients <18 years old presenting with vertigo to Hacettepe University Ihsan Dogramaci Children's Hospital Neurology Unit between January 1996–January 2012 were included ($n = 100$). Data were obtained from patient files and phone interviews.

Results: Mean age was 7.5 years. The most common etiological groups were benign paroxysmal vertigo of childhood (BPVC) (39%), psychogenic vertigo (21%), epileptic vertigo (15%), and migraine-associated vertigo (MAV) (11%). BPVC was the most common diagnosis in children ≤5 years of age while psychogenic vertigo prevailed in children >5 years. Staring episodes characterized epileptic vertigo patients ($p = 0.021$) while headache was more often described by MAV patients ($p < 0.001$). Vertigo attacks >5 min were uncommon in BPVC patients compared to others ($p = 0.013$). Twenty percent of BPVC patients contacted through phone interviews were experiencing migraine type headaches that started at a median age of 7.5 years. An algorithm for evaluation of children with vertigo was formed based on data obtained from this study and the literature. When this algorithm was applied to 100 cases of this series, 88 (88%) were correctly diagnosed.

Conclusion: While most vertigo cases in children can be diagnosed accurately by a detailed medical history, physical and neurological examination, a standard algorithm can help with the correct classification.

Abbreviations: BPVC, benign paroxysmal vertigo of childhood; MAV, migraine-associated vertigo; BPPV, benign paroxysmal positional vertigo; CT, computerized tomography; MRI, magnetic resonance imaging; EEG, electroencephalography; ECG, electrocardiography; ENT, ear–nose–throat.

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1. Introduction

Vertigo can be defined as a perception of motion in space. The first pediatric patient with vertigo was reported in 1962, but most studies have been conducted in adults.[1] Children differ from adults in the expression of the symptom, the developmental stage of balance and vestibular functions, and the causes of vertigo.[2] For instance, benign paroxysmal positional vertigo (BPPV), a common diagnostic group in adults, is rarely seen in children while benign paroxysmal vertigo of childhood (BPVC) and migraine-associated vertigo (MAV) are seen exclusively in children.[3–5] The annual prevalence of nonspecific vertigo and vestibular vertigo are 23 and 5% respectively in adults, and 0.4% and 0.05% respectively in children.[6] Another study reported a rate of 5.7% among 10-year-old children in England.[7]

Medical history is the most important part of the evaluation. As young children may not be able to describe symptoms, parents' observation of episodes of unsteadiness should be taken into account. History, physical examination including otologic and neurological examination allows diagnosis in most pediatric patients without further diagnostic tests.[8] In childhood, the most common causes of vertigo are BPVC and MAV, although frequencies vary between different studies.[3,5,9–19] BPVC is characterized by recurrent brief attacks of vertigo occurring without warning and resolving spontaneously in otherwise healthy children.[20] Diagnostic criteria include at least five vertigo attacks associated with at least one of the following: nystagmus, ataxia, vomiting, pallor, fearfulness; in addition, normal neurological examination, normal audiometric and vestibular functions between attacks are required.[20] Posterior fossa tumors, seizures and vestibular disorders should be excluded.[20] BPVC has a favorable prognosis: symptoms tend to disappear after 6–12 months.[8] It is classified as an episodic syndrome possibly associated with migraine because of frequent association with headache, family history of migraine, similar sociodemographic characteristics with migraine patients, and higher prevalence of migraine in BPVC patients.[21]

The aim of this study was to evaluate the characteristics and differential diagnosis of children presenting with vertigo and to develop a standard algorithm for children. A secondary aim is to evaluate the frequency of migraine development in BPVC patients.

2. Materials and methods

We retrospectively collected data of patients <18 years old who presented with vertigo to the Pediatric Neurology Unit, Hacettepe University Ihsan Doğramacı Children's Hospital between January 1996 and January 2012. The study was approved by the hospital's research ethics committee.

A set of variables including gender, age at vertigo onset, associated symptom(s), history of head trauma, comorbidities, family history of vertigo, migraine, epilepsy, motion sickness, examination findings (physical, neurological, audiological), imaging results, electroencephalography (EEG) results, final diagnosis and follow-up diagnoses were recorded from patient files. In addition, phone interviews were conducted with BPVC patients or their parents through a questionnaire to inquire about the outcome of vertigo and development of associated diseases or migraine.

The diagnosis of BPVC was made according to age of onset, characteristics of attacks (brief and severe in BPVC), and normal physical and neurological findings between attacks. In most cases, intracranial lesions and epilepsy were ruled out with magnetic resonance imaging (MRI) and EEG before the diagnosis of BPVC was made. The diagnosis of MAV was given if the patient had migrainous headaches following or accompanying vertigo attacks, often supported by family history of migraine. The diagnosis of psychogenic (somatoform) vertigo was made in cases with normal neurological and audiological examination who described association of attacks with stressful situations; or if no etiology could be determined by physical, neurological, vestibular examinations, MRI and EEG. In contrast, abnormal EEG in addition to

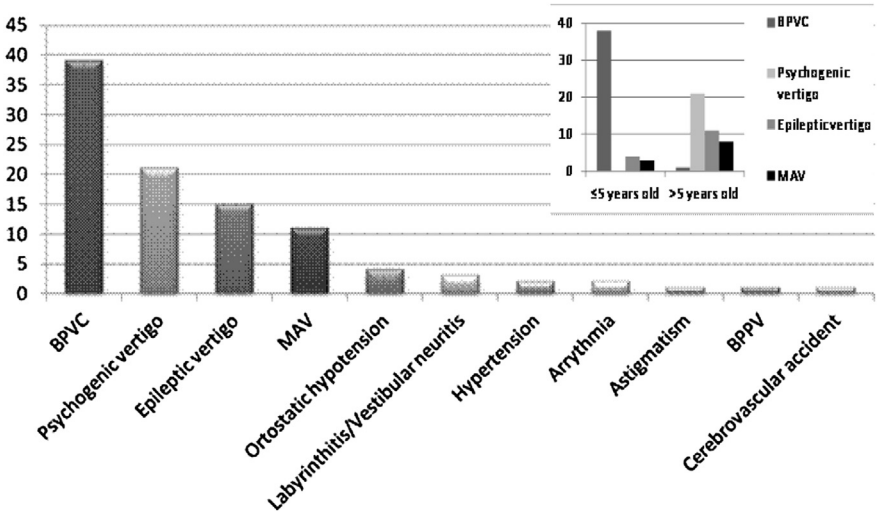

Fig. 1 – Distribution of the various diagnostic groups of vertigo. Inset: Common diagnostic groups according to age.