Can scoring of symptoms in dizzy children aid the categorization of causes of dizziness for accurate referral?

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Participants and methods
This study included 20 dizzy children, who were compared with 10 healthy children, aged 6–12 years. Assessment of history taking was carried out using an Arabic dizziness questionnaire, for which a scoring system was designed to include a thorough evaluation of the different systems involved in balance control; a comparison with the results of referral was carried out.

Objective
To categorize the causes of dizziness into diagnostic categories and to determine the ability of the scoring system to direct to a certain referral for diagnosing the cause of dizziness.

Results
The questionnaire's diagnostic categories matched the diagnosis on referral in 75% of cases. Its sensitivity in diagnosing vestibular category was 88.89%. The scoring was applied to the present history, but relevant data in the past medical and family histories were taken into consideration.

Conclusion
The questionnaire seems to be a reasonable anamnesis for use in training, with a scoring system that can categorize dizzy children by the system/systems affected. It provides questions that a trainee needs to be considering when managing balance disorders in the clinic.

Keywords:
Arabic, children, dizziness, questionnaire

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Introduction and rationale

Balance disorders in children are relatively common, but largely unrecognized. Dizziness is a lay term used to describe many different sensations, including unsteadiness, imbalance, clumsiness, lightheadedness, and vertigo. However, vertigo is a medical term referring to an illusion of movement, which may be subjective (personal perception of motion) or objective (observation of motion of the environment), and is characteristically associated with disorders of the vestibular system. Young children are often unable to describe these different perceptions, and thus, any complaint of dizziness, instability, or vertigo should be considered in the broad context of the 'dizzy child' for diagnostic purposes [1].

Three main groups of disorders giving rise to disequilibrium can be identified – general medical, neurological, and otological – with a few other disorders such as visual vertigo, cervical vertigo, and the multisensory dizziness syndrome in the elderly falling beyond this classification. A detailed history and examination will usually point the examiner in the correct direction for appropriate investigation. Inevitably, there is some overlap, in as much as diffuse cerebrovascular disease may produce both neurological and neuro-otological abnormalities, whereas general medical disorders, such as diabetes mellitus and autoimmune syndromes, may give rise to both labyrinthine and/or central vestibular dysfunction [2].

Balatsouras *et al.* [3] stated the reasons why vertigo in children differs from that in adults, because of three main reasons. First, vestibular disorders are often ignored in children, because vertiginous manifestations are usually attributed to the lack of coordination or behavioral problems. Second, as children often lack the ability to describe their symptoms accurately, the diagnosis is made based less on history and much more on clinical examination and laboratory investigations. Finally, although most diseases that cause vertigo in adulthood also occur in childhood, their frequency may be different, depending on the age of the patient [3].

Benign paroxysmal vertigo (BPV) is considered as a common cause of vertigo in children [4]. BPV of childhood is one of five known migraine variants (also known as migraine-equivalent syndromes), which exist with or without headache. These include BPV of childhood, cyclic vomiting, infantile torticollis, acephalgic migraine, and acute confusional migraine [5,6]. The diagnostic criteria for BPV are as follows: at least five attacks of multiple episodes of severe vertigo, occurring without warning and resolving spontaneously after minutes to hours, with a normal neurological examination; audiometric

and vestibular functions between attacks and a normal electroencephalogram. A family history of migraine can almost always be found [5,7–9].

Migraine-associated dizziness symptoms may begin in childhood or later in adulthood. The manifestations vary considerably, ranging from episodic true vertigo, to constant disequilibrium, or space and motion discomfort. These vestibular symptoms can occur during headache, or without headache, or before the onset of headache. Vertigo is sometimes the only symptom associated with the headache [10]. Migraine headache in children usually occurs in the frontal or the periorbital regions, lasts less than 2 h, and may not be perceived as throbbing. Nausea, vomiting, vertigo, and visual disturbances are associated with these headaches [11]. In basilar migraine, there is an aura consisting of a sporadic imbalance of a short duration, vertigo, ataxia, tinnitus, and hearing loss [12]. The neurological examination is normal. Some authors define this symptom complex as vestibular migraine or migraine-related vestibulopathy [13,14].

Balance disturbances may occur in children with otitis media (OM) [15]. Serous labyrinthitis is responsible for vestibular disturbance [16]. Postural instability during OM with effusion is because of pressure changes in the middle ear cavity and this results in labyrinthine symptoms [17].

Head control and the ability to sit, stand, walk, and run are normally accompanied by the integration of vestibular inputs with visual, proprioceptive, and other somatosensory inputs. Lack of vestibular input has been shown to delay the acquisition of these motor skills [18]. Infants with vestibular dysfunction eventually achieve motor milestones. Those with vestibular hypofunction eventually learn to use these weak vestibular signals to generate an appropriate motor response, a process that could be considered delayed vestibular maturation. In comparison, patients with vestibular areflexia will have lingering concerns about balance throughout life despite the compensatory substitution of visual and proprioceptive inputs to help stabilize posture. The vestibulo-ocular system, similar to the vestibulospinal system, partially compensates for the lack of vestibulo-ocular reflex by enhancing its use of smooth pursuits and optokinetic inputs [19].

A correct diagnosis of vertigo syndromes in childhood, although considered a difficult challenge, makes successful therapy possible, prevents unnecessary investigations, and alleviates the worries of parents [20]. The child's first-hand description of the problem is invaluable and should always be carefully sought where possible [21]. Ravid *et al.* [22] designed a pediatric 'dizziness questionnaire' and developed a computer-assisted algorithm to facilitate the diagnostic task.

The aim of this work was to categorize the causes of childhood dizziness into diagnostic categories by an assessment of history and developing a special scoring system for this, and to determine the ability of this scoring system to direct to a certain referral for diagnosing the cause of dizziness in dizzy children presenting to our audiology clinic.

Participants and methods

Participants were divided into two groups:

(1) A study group (cases), which included 20 children suffering from dizziness, aged 6–12 years, same as the cases. They were recruited from those attending the dizziness clinic. There was no restriction as to the degree of hearing, or the type and laterality of hearing loss.
(2) A control group, which included 10 healthy children not complaining of dizziness aged 6–12 years, well matched to the cases with respect to age and sex. Controls were recruited from among the relatives of doctors in our clinic, in addition to some children with hearing loss not complaining of dizziness to match the cases with hearing loss with no restriction as to the degree of hearing, or the type and laterality of hearing loss.

The study was carried out during the period between October 2010 and July 2011 at the Audiology Clinic, Kasr Al-Aini Hospital, Faculty of Medicine, Cairo University. All children were subjected to:

(1) History taking using a dizziness questionnaire. The dizzy child questionnaire was filled through an interview with all parents of dizzy children and their controls as well as the children themselves whenever possible. History was assessed by an audiological physician (a senior resident) and the time required to complete the assessment was 30–45 min.
The questionnaire was developed in the light of a good knowledge of causes of childhood dizziness and with the help of previously validated questionnaires: the structured approach formula designed by a European Study Group of Vertigo in Children reported by Niemensivu *et al.* [15]; the pediatric structured questionnaire reported by Ravid *et al.* [22], and the pediatric neurophysiologic questionnaire reported by PNSA [23]. It included the following: (a) description of dizziness, (b) relevant medical history, (c) effect of dizziness on school, educational, and daily activities, (d) developmental and educational history, (e) relevant past medical history (and system review), and (f) family history. The questionnaire was administered more than once and test–retest results of the questionnaire showed that 95% of the study groups were within the same category of conclusion. Twenty percent showed differences in the description of the dizziness attacks. Twenty-five percent showed differences in the exact duration of the dizziness attack. Five children (aged 9–12 years) could answer the questions. The questions were grouped into seven diagnostic categories reflecting the different systems involved in balance control, with overlapping of some category questions. There

were 24 questions in each of the vestibular and the neurological categories; eight questions in the general category; four questions in each of the cervical and ocular categories; six questions in the cardiovascular (CVS) category; and three questions in the psychological category. Therefore, a common denominator of 24 was used for our scoring system, with a total of 24 points for each of the seven major categories. Accordingly, vestibular category was assigned 1 point for a 'yes' answer in each of the 24 questions and was defined as associated or not with hearing loss. Neurological category was assigned 1 point for a 'yes' answer for each of the 24 questions. General category was assigned 3 points for a 'yes' answer for each of the eight questions. CVS category was assigned 3 points for a 'yes' answer in each of the eight questions. Cervical category was assigned 6 points for a 'yes' answer for each of the four questions. Ocular category was assigned 6 points for a 'yes' answer for each of the four questions. Psychological category was assigned 8 points for a 'yes' answer for each of the three questions. A percentage of impairment score was obtained, and the total scoring of each system was described. The conclusions of the questionnaire were built on the basis of the present history results of each category score, aided by any relevant data provided in the past medical or family history and system review. Thus, a conclusion was reached from the questionnaire for each child, that is, on an individual basis, which led to a certain direction in the referral for diagnosis. The results of referral to different clinics were used to assess the ability of the questionnaire to assign dizziness into diagnostic categories.

(2) Otologic examination including otoscopy and tuning fork tests.
(3) Bedside examination of the dizzy patient, including search for spontaneous or gaze nystagmus, ocular motor testing, head thrust and head shake tests, fixation suppression test, positioning tests, stance and gait tests, and cerebellar limb tests.
(4) Audiometric assessment in a sound-treated room, Amplisilence Model E, using a two-channel pure-tone audiometer: GSI 61; VIASYS Healthcare Inc., USA, calibrated according to the American National Standards Institute. It included the following:
    (a) Pure-tone audiometry: in the form of air conduction in the frequency range of 250–8000 Hz. and bone conduction in the frequency range of 500–4000 Hz.
    (b) Speech audiometry; including the speech reception threshold, using Arabic [24] spondaic words, and the word discrimination score using Arabic phonetically balanced words [25].
    (c) Tympanometry using single-component, single-frequency tympanometry with a probe tone of 226 Hz. Immittance meter: Madsen Zodiac 901 middle ear analyzer, GN Otometrics, Denmark. The acoustic reflex threshold test for ipsilateral and contralateral elicited reflexes was carried out using pure tones at 500, 1000, 2000, and 4000 Hz.
(5) Videonystagmography, using monocular goggles (Micromedical Technologies Inc., Spectrum Software, Chatham, Illinois, USA). This was only performed when required (i.e. when a diagnosis of vestibular disorders was suggested by the history), and the result of testing was correlated to that suggested by the history.

Statistical methods

Data were statistically described in terms of mean ± SD, median and range, or frequencies (number of cases) and percentages when appropriate. Comparison of numerical variables between the study groups was carried out using the Mann–Whitney *U*-test for independent samples. For comparison of categorical data, the χ^2-test was carried out. The Exact test was used instead when the expected frequency was less than 5. *P* values less than 0.05 were considered statistically significant. All statistical calculations were carried out using computer programs statistical package for the social science (SPSS Inc., Chicago, Illinois, USA) version 15 for Microsoft Windows.

Results

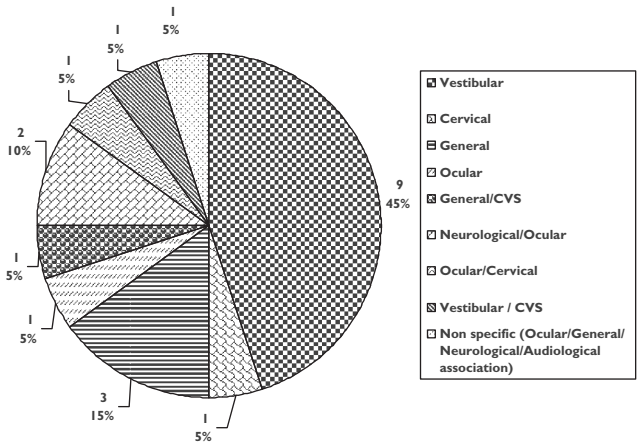
The mean duration of dizziness in the cases was 10.81 ± 3.32 months, ranging from 1 week to 5 years. Their age ranged from 6 to 12 years (mean = 9.75 ± 2.10). There were 13 males and seven females, mean age 9.6 ± 2.07 years. Controls included 10 healthy children, seven males and three females. There was no statistically significant difference between both groups with respect to age ($Z = -0.246$; $P = 0.806$) or sex ($\chi^2 = 0.076$; $P = 1.000$).

There was a statistically significant difference between the cases and the controls with respect to the seven categories assessed, except the total cervical score, the psychological score as well as the hearing-related score. According to the scoring provided by the questionnaire, a conclusion was drawn on the affected category. The diagnosis reached by the questionnaire describing a single system was found in six of 20 (30%), and multisystem affection in 14 of 20 (70%) cases.

Figure 1 shows the distribution of the diagnostic categories concluded from the questionnaire, and Fig. 2 shows the final diagnoses according to the referral. Tables 1 and 2 show the diagnoses upon referral to different clinics and data of all 20 cases included in this study: conclusions of both the questionnaire and referral and whether its diagnostic category matches or not and the final diagnosis. The matching ability in different categories is shown in Table 3. There was no statistically significant difference with respect to the matching of the questionnaire's diagnostic category and the referrals in cases with single (71.4%) versus multiple system affection (83.3%) (χ^2 Fisher's exact test = 0.317; $P = 1.000$).

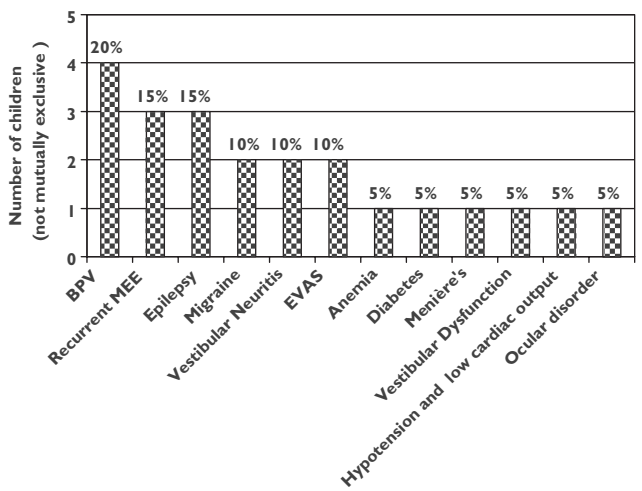
Table 4 shows the degree and type of hearing loss in both ears of the cases and the controls. There was no statistically significant difference between both groups with respect to the presence of hearing loss or the distribution

Figure 1



Distribution of the diagnoses according to the questionnaire. CVS, cardiovascular.

Figure 2



Final diagnoses according to the referral. BPV, benign paroxysmal vertigo; EVAS, enlarged vestibular aqueduct syndrome; MEE, middle ear effusion.

Table 1 Conclusion according to the referral

Final diagnosis according to the referral	Case Number	*N* (%)
BPV (normal on referral)	2, 11, 16, 17	4 (20%)
Peripheral vestibular		
Vestibular		
Vestibular neuritis	12, 20	2 (10%)
Vestibular/audiological association		
Menière's	14	1 (5%)
EVAS and recurrent MEE (in Pendred)	1	1 (5%)
EVAS	4	1 (5%)
Vestibular dysfunction associated with unilateral profound SNHL (possible mumps or congenital)	8	1 (5%)
Recurrent MEE – labyrinthitis	10	1 (5%)
Neurological/audiological association		
Epilepsy + MEE	7	1 (5%)
Neurological		
Epilepsy	3	1 (5%)
Epilepsy + delayed development	6	1 (5%)
General		
Anemia, diabetes	5, 18	2 (10%)
CVS		
Hypotension and low cardiac output	19	1 (5%)
Ocular, post-traumatic lens dislocation and cervical vertigo		
Ocular disorder	13	1 (5%)
Neurological/central vestibular		
Migraine	9, 15	2 (10%)
Psychological disorders	–	0 (0%)
Total		20 (100%)

BPV, benign paroxysmal vertigo; CVS, cardiovascular; EVAS, enlarged vestibular aqueduct syndrome; MEE, middle ear effusion.

of hearing loss (Tables 5 and 6). The causes of sensorineural hearing loss (SNHL) in the cases included Pendred, enlarged vestibular aqueduct (EVA), Meniere's disease, trauma, and unknown cause. The causes of SNHL in the controls included hereditary, syndromic, and nonsyndromic SNHL. The causes of CHL included middle ear effusion in both cases and controls. The questionnaire's reported hearing loss in relation to the questionnaire's conclusion of the vestibular category and the audiometry result are shown in Tables 5 and 6, respectively. Table 7 shows the questionnaire's reported hearing loss in relation to the audiometry result. Table 8 shows the questionnaire's reported hearing loss in relation to the questionnaire's conclusion of the vestibular category. Tinnitus was found in 40% of cases and 20% of the controls. There was no statistically significant difference between both groups with respect to tinnitus ($\chi^2 = 1.200$; $P = 0.419$). It was found that 37.5% of tinnitus cases were categorized by the questionnaire as having vestibular causes of dizziness and only 33.3% of vestibular causes of dizziness had tinnitus.

The questionnaire indicated that two cases were of neurological versus ocular categories; upon referral, both matched this diagnostic category (Table 3). One case (case 6) was diagnosed as a neurological disease (epilepsy) associated with spontaneous nystagmus and the other (case 15) as migrainous vertigo (Table 2). Neurological evaluation of the cases after referral showed that four patients had neurological disease; the questionnaire was able to diagnose two of them and missed two cases, as one of the cases had multisystem affection, yielding a nonspecific conclusion (case 7), and the other one was suggested to be of the vestibular category (case 3). Migraine-associated dizziness was found in case 9, who had migraine, dizziness, and tinnitus, and was included in the vestibular category, with a medical history of migraine medication and a family history of migraine, which again indicates the importance of assessment of complete history in diagnosis because of overlapping of the category questions.

Conclusion of the questionnaire included two cases in the ocular category; eye examination upon referral proved that ocular affection was the cause of dizziness in one of the cases with ocular and cervical categories of equal scores (case 13), but not in the other (case 12). However,

Table 2 Cases included in this study: category scores, diagnostic category according to the questionnaire, matching of the questionnaire diagnosis to that of the referral and the final diagnosis

	Category scores										
Case serial number	Vestibular	Neurologic	General	Cervical	Occular	CVS	Psychologic	Questionnaire's diagnostic category	Conclusion according to the referral	Matching of the questionnaire's diagnostic category to that of the referral	Final diagnosis
1	83.3	87.5	88	100	100	83.33	100	Possible congenital vestibular/recurrent MEE/CVS	Vestibular/ audiologic/CVS	Yes	EVAS in Pendred syndrome (hypothyroidism) with recurrent MEE/CVS
2	87.5	91.67	75	100	100	83.33	100	General	Normal	No	Unknown, BPV
3	87.5	95.83	100	100	100	100	100	Vestibular	Neurological	No	Epilepsy
4	70.8	95.83	100	100	100	100	100	Vestibular	Vestibular/ audiologic	Yes	EVAS (vestibular)
5	91.7	95.83	75	100	100	83.33	100	General	General	Yes	Anemia
6	75	50	88	100	50	100	100	Neurological/ocular	Neurological	Yes	Epilepsy and delayed development
7	83.3	75	75	100	75	83.33	100	Ocular/general/ neurological/audiological	Neurological/ audiological	No	Epilepsy/recurrent MEE
8	70.8	91.67	88	100	75	100	100	Vestibular	Vestibular	Yes	Vestibular dysfunction
9	75	95.83	100	100	100	100	100	Vestibular Migraine	Vestibular	Yes	Migrainous vertigo
10	66.7	87.5	88	100	75	100	100	Vestibular	Recurrent MEE	Yes	Recurrent MEE with labyrinthitis
11	83.3	91.67	100	50	100	100	100	Cervical	Normal	No	Unknown, BPV
12	83.3	95.83	88	100	75	100	100	Ocular	Vestibular	No	Vestibular neuritis
13	91.7	87.5	88	75	75	100	100	Ocular/cervical	Ocular	Yes	Ocular (lens dislocation after trauma)/ cervical after trauma
14	75	87.5	100	100	100	100	100	Vestibular	Vestibular	Yes	Menière's
15	87.5	75	88	100	75	100	100	Neurological/ocular	Neurological/ vestibular	Yes	Migrainous vertigo
16	79.2	91.67	100	100	100	100	100	Vestibular	Normal	Yes	Unknown, BPV
17	79.2	87.5	88	100	100	83.33	100	Vestibular	Normal	Yes	Unknown, BPV
18	95.8	91.67	38	100	100	83.33	100	General	Endocrine	Yes	Diabetes
19	95.8	91.67	50	100	100	50	100	General/CVS	CVS	Yes	CVS (hypotension, low cardiac output).
20	75	95.83	100	100	100	100	100	Vestibular	Vestibular	Yes	Vestibular neuritis

BPV, benign paroxysmal vertigo; CVS, cardiovascular; EVAS, enlarged vestibular aqueduct syndrome; MEE, middle ear effusion.

Table 3 Conclusion reached from the questionnaire in different categories and the distribution according to the ability of the questionnaire to match the diagnosis on referral

	N (%)		
Our questionnaire conclusion	Matching	Not matching	Total
Vestibular	8 (88.89)	1 (11.11)	9 (100.00)
Cervical	0 (0.00)	1 (100.00)	1 (100.00)
General	2 (66.67)	1 (33.33)	3 (100.00)
Ocular	0 (0.00)	1 (100.00)	1 (100.00)
General/CVS	1 (100.00)	0 (0.00)	1 (100.00)
Neurological/ocular	2 (100.00)	0 (0.00)	2 (100.00)
Ocular/cervical	1 (100.00)	0 (0.00)	1 (100.00)
Vestibular/CVS	1 (100.00)	0 (0.00)	1 (100.00)
Multisensory (nonspecific category) (ocular/general/ neurological/audiological association)	0 (0.00)	1 (100.00)	1 (100.00)
Psychological disorders	0 (0.00)	0 (0.00)	0 (0.00)
Total	15 (75.00)	5 (25.00)	30 (100.00)

$\chi^2 = 11.704$.
BPV, benign paroxysmal vertigo; CVS, cardiovascular.
$P = 0.165$.

Table 4 Degree and type of hearing loss in both ears of the cases and the controls

	Right	Left
Cases		
Bilateral SNHL	Mild to moderate	Mild to moderate
	Moderate	Profound
	Mild	Moderate
	Mild	Mild
	Mild low frequencies	Mild low frequencies
Bilateral conductive	Mild	Mild
Unilateral SNHL	Profound	Normal
	Normal	Mild at 8 kHz
Controls		
Bilateral SNHL	Moderately severe	Moderately severe
	Profound	Mild low frequencies
Bilateral conductive	Mild	Mild

Table 5 Hearing loss distribution in the study and the control groups

	N (%)		
	Study	Control	Total
Hearing loss	8 (40.00%)	3 (30.00%)	11 (36.67%)
Normal	12 (60.00%)	7 (70.00%)	19 (63.33%)
Total	20 (100.00%)	10 (100.00%)	30 (100.00%)

$\chi^2 = 0.287$.
$P = 0.702$.

Table 6 Type of hearing loss in the study and control groups

	N (%)		
	Study	Control	Total
Bilateral normal	12 (60.00%)	7 (70.00%)	19 (63.30%)
Bilateral conductive hearing loss	1 (5.00%)	1 (10.00%)	2 (6.70%)
Bilateral SNHL	5 (25.00%)	2 (20.00%)	7 (23.30%)
Unilateral SNHL	2 (10.00%)	0 (0.00%)	2 (6.70%)
Total	20 (100.00%)	10 (100.00%)	30 (100.00%)

$\chi^2 = 1.427$.
$P = 0.565$.

Table 7 The questionnaire's reported hearing loss in relation to the audiometry result

	Questionnaire's hearing association score		
Audiometry result	Hearing loss	No hearing loss	Total
Hearing loss [*N* (%)]	7 (77.78)	1 (9.09)	8 (40.00)
No hearing loss [*N* (%)]	2 (22.22)	10 (90.91)	12 (60.00)
Total [*N* (%)]	9 (100.00)	11 (100.00)	20 (100.00)

$\chi^2 = 9.731$.
$P = 0.003$.

Table 8 The questionnaire's reported hearing loss in relation to the questionnaire's conclusion of the vestibular category

	Questionnaire's hearing association score		
Questionnaire's conclusion	Hearing loss	No hearing loss	Total
Vestibular [*N* (%)]	8 (88.89)	1 (9.09)	9 (45.00)
Other categories [*N* (%)]	1 (11.11)	10 (90.91)	11 (55.00)
Total [*N* (%)]	9 (100)	11 (100)	20 (100)

$\chi^2 = 12.735$.
$P = 0.001$.

the patient also had an error of refraction in addition to the vestibular neuritis diagnosed (Tables 2 and 3).

One case (case 11) was considered to be of the cervical category (score of 50%), but showed normal results at different clinics, and was diagnosed as a possible BPV. This case had a decreased vestibular score (83.3%) according to our questionnaire, indicating the importance of considering all the decreased scores.

Three of the dizzy children were categorized under the general causes of dizziness. Upon referral at different clinics and laboratories, only two cases were found to have vertigo because of general causes: one was anemic (case 5) and the other was diabetic (case 18). Case 2, for whom the questionnaire's diagnosis did not match the referral results, which were normal at different clinics including vestibular and neurological examination, was finally found to have BPV.

One case (case 19) was considered to be in the general versus cardiac category and for whom the questionnaire's diagnosis matched the referral results, was found to have a cardiac cause (Tables 2 and 3). While none of the controls had any CVS diseases.

Assessment of history of delayed motor skills indicated that one case had a neurological disease (case 6), and another, who was hypotonic in Pendred, had a syndrome associated with dizziness (case 1) (Table 2). Two (10%) cases had a history of delayed language development: one had a neurological disease (case 6) and the other had hereditary hearing loss and tinnitus (case 14) that was diagnosed according to history to be Menière's disease. However, no controls had any such history. There was no statistically significant difference between the two groups because of the small number of cases, but assessment of history helped on an individual basis, considering all

items in the questionnaire together for every case independently. Three cases had a history of delayed cognitive skills and achievement: one had a neurological disease (case 6), one had hereditary hearing loss (case 14), and one had Pended syndrome associated with dizziness (case 1).

Thirty percent of the cases had a past history of vestibular and ear diseases (10% had EVA, 10% had hearing loss, and 15% had recurrent middle ear effusion), whereas 10% of the controls had hearing loss, but there was no statistically significant difference between the two groups with respect to the presence of vestibular and ear diseases ($\chi^2 = 10.491$; $P = 0.372$). However, five of the six diagnosed by the questionnaire to have been in the vestibular category matched the diagnosis after referral, and this was statistically significant ($\chi^2 = 6.000$; $P = 0.020$). One case had convulsions and one control had headache, and there was no statistically significant difference between both the groups with respect to the presence of neurological diseases ($\chi^2 = 0.268$; $P = 1.000$). One case had anemia, whereas two controls had hematuria. There was no statistically significant difference between the two groups with respect to the presence of general diseases ($\chi^2 = 0.268$; $P = 1.000$). There was no statistically significant difference between both the groups with respect to the presence of CVS diseases ($\chi^2 = 0.517$; $P = 1.000$). One case had congenital cataract and the other had errors of refraction, whereas none of the controls had eye diseases. There was no statistically significant difference between both the groups with respect to the presence of eye diseases ($\chi^2 = 1.071$; $P = 0.541$). Five percent of the cases and 10% of the controls had a past history of physical head and neck trauma ($\chi^2 = 0.268$; $P = 1.000$). The past history of respiratory diseases was irrelevant in terms of dizziness, being present only in the controls, who had no complaints of dizziness.

There was no history of prenatal maternal drug or alcohol abuse or prenatal CMV in both the groups. Two cases had a history of natal abnormalities in the form of preterm labor and a congenital abnormality in the form of a cleft palate, whereas one of the controls had a history of cyanosis. However, there was no statistically significant difference between both the groups with respect to the presence of any abnormality at birth ($\chi^2 = 0.000$; $P = 1.000$). Ten percent of cases had endocrine diseases in the form of diabetes (5%) and hypothyroidism (5%) (Pendred), whereas none of the controls had any disease. One of the cases had Pendred syndrome and also 1 of the controls had Alport's syndrome (a syndrome associated with hearing loss). However, there was no statistically significant difference between both the groups with respect to the associated hearing loss (syndromic or nonsyndromic) ($\chi^2 = 0.268$; $P = 1.000$); endocrine diseases ($\chi^2 = 1.071$; $P = 0.540$). Two cases had delayed motor skills and delayed language development and three had delayed achievement and delayed cognitive skills, but none of the controls had any, but there was no statistically significant difference between both the groups ($P > 0.05$). There was no history of psychological or behavioral abnormalities in both the groups. There was no statistically significant difference ($\chi^2 = 4.286$; $P = 0.103$) between both the groups with respect to the presence of respiratory diseases, but this was irrelevant to dizziness having been present in two controls, in the form of bronchial asthma, but in none of the cases. Dizziness had an effect on school and daily activities in 40% of cases.

Thirty-five percent (seven cases) received medication that was relevant in six of them, such as vestibular suppressants or medications for treatment of the cause of vertigo/dizziness. One of the cases (5%) underwent eye surgery for correction of congenital cataract. Twenty-five percent of the cases underwent different other surgical interventions, compared to 30% of the controls. One case and one control had a history of head trauma, with no statistically significant difference between the two groups.

Forty percent of the cases and 50% of the controls had a family history of different diseases. Three cases and two controls had a family history of ear or vestibular disorders, but there was no statistically significant difference between them ($\chi^2 = 0.120$; $P = 1.000$). Ten percent of both cases and controls had a family history of neurological disorders in the form of migraine. There was no statistically significant difference between both the groups ($\chi^2 = 0.000$; $P = 1.000$). Five percent of the cases had a family history of ocular disorders in the form of congenital cataract, whereas 10% of the controls had errors of refraction (myopia). There was no statistically significant difference between both the groups with respect to a family history of eye disorders ($\chi^2 = 0.000$; $P = 1.000$). Two cases versus one control had a family history of CVS diseases. There was no statistically significant difference between both the groups with respect to a family history of CVS ($\chi^2 = 0.000$; $P = 1.000$).

Discussion

To the best of our knowledge, there are few studies on assessment of history of childhood dizziness. Therefore, we compared the results of our study with those of Ravid *et al.* [22], who used the pediatric structured questionnaire, and with those of Niemensivu *et al.* [15], who used the structured approach formula designed by a European Study Group of Vertigo in Children.

The conclusion reached using the dizzy child questionnaire in our study matched the category of diagnosis in 75%. The matching ability of single versus multiple systems was not statistically significant, but it varied in different categories. It was not sensitive in matching ocular or cervical categories alone, because of the similarities of presentations of these categories with symptoms of other categories. With respect to the vestibular category that was the most common cause of dizziness on the basis of the questionnaire's conclusion, 88.89% matched the referral. The questions of the cervical category were somewhat misleading because of overlapping of the category questions, with some similarities to benign paroxysmal positional vertigo and post-traumatic vertigo (central or peripheral vestibular, or cervicogenic).

The sensitivity of the dizzy child questionnaire in our study, in detecting hearing loss, was 87.5%; it missed one case who did not complain of hearing loss, having been of a mild degree at the time of testing (resolution of OM) (case 7), but had recurrent OM with more deterioration in hearing at other times. The specificity of the questionnaire for hearing loss was 83.3%; two of the cases who had reported hearing loss (case 10 and 20) had normal hearing at the time of testing. Our tinnitus results were not surprising as not all peripheral vestibular dysfunction causes are associated with audiological symptoms, and tinnitus can be a symptom of many disorders, not just ear diseases. However, the present history was very valuable in the diagnosis on an individual basis, especially in the case of Menière's disease. In comparison, tinnitus was reported, in a study by Niemensivu *et al.* [15], by 42% in the study group, whereas 17% in the control group had tinnitus. None of the patients had severe or continuous tinnitus.

The statistically nonsignificant differences in our study between the cases and the controls with respect to the past medical history and family histories were not surprising, because of the small number of cases included in each of the different categories and because of the diversity of causes of the vertigo. Therefore, the scoring was applied to the present history alone, but relevant data in the past medical history and family history were taken into consideration. They were important for diagnosis when applied to every patient separately. The past history of vestibular or ear diseases was very valuable in diagnosis on an individual basis as five of six (83.3%) cases with a past history of ear diseases were of the vestibular category and this was statistically significant. A past history of eye diseases was important for the diagnosis of the case with congenital cataract. Although there was no statistically significant difference between both the groups with respect to a past history of CVS diseases, history was diagnostic for the cause of dizziness in the child with cardiac disease. The past history of endocrine diseases was important for diagnosis on an individual basis. History of drug intake was very useful in the diagnosis of cases. A history of surgical intervention was helpful in the diagnosis of congenital cataract, which, together with a history of head trauma, led to the diagnosis of a possibility of ocular lens dislocation as the cause for the child's vertigo. Family history alone was inconclusive, except in providing information additional to that obtained from the present history of the complaint, on which we have based our scoring system. It helped in the diagnosis of each case independently, for example case 13 with a family history of congenital cataract and a family history of migraine in case 17 (BPV).

Questions that helped in the categorization of causes of dizziness, in addition to a description of the vertigo itself, were related to hearing problems and tinnitus, migraine headaches, seizures, visual problems, and symptoms related to endocrinal diseases, head traumas, and delayed motor skills. In comparison, Niemensivu *et al.* [15], reported that the most important questions were related to headaches and head traumas. More headaches and head traumas were observed in vertiginous children than in healthy controls. They also reported that the structured data collection approach improved the evaluation of vertiginous children. Ravid *et al.* [22] found that in 57 patients (92%), the questionnaire-derived diagnosis was identical to the medical record diagnosis. In 52 patients (84%), the algorithm-derived diagnosis matched the medical record diagnosis. The questionnaire and computer-assisted algorithm are reliable diagnostic screening tools for children with dizziness or vertigo. When these tools, combined, provide a clear-cut diagnosis, no further evaluation is necessary [20].

The most common cause of dizziness in our study after referral was BPV, followed by OM-related vertigo and epilepsy, migraine, vestibular neuritis and EVAS, anemia, diabetes, Menière's disease vestibular dysfunction associated with SNHL, because of either mumps or congenital, CVS, and ocular or post-traumatic cervical disorders. In comparison, the most common final diagnosis by Ravid *et al.* [22] was migraine (39% of patients). Other common diagnoses were BPV (15%), vestibular neuronitis (14%), anxiety or panic episodes (13%), and orthostatic hypotension (8%) [20]. The predominant diagnoses in the evaluation of vertiginous children were BPV of childhood, OM-related vertigo, and migraine-dizziness vertigo [15,26,27].

Conclusion

The assessment of history using the questionnaire as well as its scoring system facilitated categorization of the dizzy children by the affected system/systems. The diagnostic categories by the questionnaire matched that of the referral in 75% of cases. Its sensitivity for multisystem affection was 83.3%. Its sensitivity in diagnosing the vestibular category was 88.89%. However, we could not determine the actual sensitivity in other categories because of the small numbers of cases distributed over these categories as most cases encountered in our audiology and balance clinic are mostly of the vestibular category. The assessment of history and its scoring system seems to be a reasonable anamnesis to be used in training. This provides the questions that a trainee needs to be considering when managing balance disorders in the clinic. We recommend using the questionnaire on a large sample for further validation.

Acknowledgements

Conflicts of interest

There are no conflicts of interest.

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Appendix 1. Children Dizziness Questionnaire

Appendix 1: **Children Dizziness Questionnaire**			
Patient's (Child's) Name: **Age:** **Birth date:** **Date of evaluation:** **Telephone** **Person completing history:** **Education (occupation):**			
Category and number of scored questions	**Symptoms**	**YES**	**NO**
Describe your dizziness			
V1	Whirling, do you spin, does the world spin		
V2	Movement up and down, movement side to side		
N1/G1	Faintness, light headed		
N2	Blackouts		
N3/ CVS1	Syncope		
N4 / V3/ G2 / Oc1	Unsteady walking , sense of falling or falling		
V4	Trouble walking in dark		
.	**Duration:** When did you first experience feelings of dizziness		
V5/N5	**Course:** Does your dizziness occur **in attacks or episodes**		
Onset of each attack			
.	Sudden		
.	Gradual		
Duration of each attack: How long do the spells last			
.	**Seconds**		
.	**Minutes**		
.	**Hours**		
.	**Days**		
Frequency: first attack? How often do you have the dizzy spells			
.	**Increasing**		
.	**Decreasing**		
.	**Stationary**		
Severity of each attack			
.	**Increasing**		
.	**Decreasing**		
.	**Stationary**		
.	do you feel DIZZY **in between your dizziness spells**		
Before the attack:			
Peripheral V6	Viral infection (common cold – flu); ear symptoms (blockage, tinnitus?)		
N6 (migraine)	Aura (phonophobia, photophobia)		

Category	Symptoms	YES	NO
Precipitating Factors: Do any of the following make your dizziness **worse or trigger it:**			
Certain **diet**			
G3/E	Hunger, overeating		
N7 (migraine)	Drinking coffee, tea, cola/ Eating chocolate		
Peripheral V7 (Menière's)	Eating Salty food		
Certain positions			
CVS2/ G4	Standing, standing quickly, sitting to standing, lying to sitting		
G5	Even when lying down, or sitting still		
Central V/ Peripheral V8 (BPPV)/ cervical1	supine, lateral body positions,		
	Change head positions, turning the head.		
Pressure changes:			
Peripheral V9	Coughing ,sneezing, constipation		
Peripheral V10	**Diving**		
Peripheral V11	**Flying**		
Peripheral V12	**Transportation**		
Peripheral V13	Loud **sounds**		
Peripheral V14	**Height**		
N8	**Hyperventilation**		
N9	**Mental stress**		
G5/ CVS3	**Physical stress, Fatigue or overwork**		
Trauma:			
V15/ N10/ cervical2	**Head/neck trauma**	**YES**	**NO**
Drugs:			
N11	Aspirin or pain killers		
Central V16/ N12	Sedatives, tranquilizers, sleeping pills, hallucinogenic		
V17	IV antibiotics		

Category	Symptoms	YES	NO
Relieving factors: What **improves** your dizziness?			
Non-specific	Spontaneous		
Non-specific	Drugs		
G7/ E	Eating		
Non-specific	Sitting still, sleep, rest		
CVS4	Sitting from standing		
Peripheral V18/ cervical3	Change head position, keeping head still		
Associated symptoms:			
General, vegetative			
Non-specific	**Skin:** Pallor, cold extremities, sweating		
CVS5	**Skin:** bluish		
CVS6	Dyspnea (difficulty breathing), chest pain		
Non-specific	Palpitation		
Non-specific	**GIT:** nausea, vomiting,		
Non-specific	Blurred vision		
Bone and Joint			
Cervical4	Neck pain or stiffness		
Neurological *(Headache, Orientation, Sensory, Motor, bulbar, cerebellar ,…..*			
N13	Migraine, Headache (severe, recurrent)		
N14	Confusion, disturbed or loss of consciousness, Memory loss,		
N15	Hypoesthesia or Numbness around the mouth, in hands, in legs		
N16	Convulsions (seizures), Jerking in arms and legs		
N17	Difficulty in speech (slurred), Difficult swallowing (dysphagia), choking		
N18	Movement iIn-coordination (decreased ability to button and unbutton clothes)		
Psychiatric:			
Ps1	Anxiety, depression		
Ps2	Phobia		
Eye (Ocular)			
Oc2, V19, N19	Abnormal eye movement (nystagmus)		
Oc3	Diminution (deterioration) of vision		
Oc4, G8	Blurred vision , Double vision, Spots before eyes		
N6 (migraine)	Light sensitivity (photophobia)		
Ear			
N6 (migraine)	Phonophobia		
Peripheral V20	Hearing loss or change in hearing, fullness of ears, (left- right)		
	Ringing in ears,		
	Discharge from ears		

Category	Symptoms	YES	NO
Relevant medical history:			
V21 /hear	**Does the child have hearing problems (hearing loss)?**	**YES**	**NO**
	Rt		
	Lt		
	In both ears?		
	which is worse **RIGHT > LEFT**		
	which is worse **RIGHT < LEFT**		
	Does your hearing fluctuate (go up and down)?		
Peripheral V21/ hear	**Has the child had a history of frequent ear infections? Discharge?**	**YES**	**NO**
V21	Do you get **noise or ringing** in your ear?	**YES**	**NO**
	Rt		
	Lt		
	In both ears?		
	which is worse **RIGHT > LEFT**		
	which is worse **RIGHT < LEFT**		
	does this increase while you are feeling dizzy?		
	Do you have pressure or fullness in your ear?		
	Please list all medications the child currently takes		
	.....		
Syndromes associated with vertigo/ Hearing loss i.e. hereditary or congenital		**YES**	
congenital	**Was the child born with any disease? Is the child taking any replacement therapy?**	**YES**	**NO**
congenital V22	**Ear deformity?**	**YES**	**NO**
Effect of dizziness on:			
	School and educational		
	Daily activities		
Developmental History			
N20	**Delayed motor development**?	**YES**	**NO**
N21	**Decreased cognitive skills** at play or school activities?	**YES**	**NO**
N22/ V23 (hearing (problem	**Delayed language development**	**YES**	**NO**
N23/V24	**Delayed educational development**	**YES**	**NO**
Ps3 /N24	**Abnormal psychological behaviour** (hyperactive, autistic, anti-social, lazy, sleepy, aggressive, has incontinence)	**YES**	**NO**

Category	Symptoms	YES	NO
Relevant Past medical history:			
(Pre-natal History)			
Vestibular	Maternal Drug or Alcohol Abuse (Vestibulotoxicity)	**YES**	**NO**
Vestibular	Cytomegalovirus	**YES**	**NO**
(Natal History)			
Vestibular/ cervical, Neurologic	Any problems: Trauma to head or neck, hypoxia, LBW, preterm, jaundice, palor, cyanosis, received blood transfusion……	**YES**	**NO**
(Post-Natal History)			
Surgery:			
Peripheral V	**Ear**		
N	Head		
Oc	Eye		
G/	**Others (congenital)**		
Trauma:			
Peripheral V	**Ear**		
N	Head / loss of consciousness		
Oc	Eye		
G/	**Others**		
Acoustic Trauma:		**YES**	**NO**
Diseases:			
General		**YES**	**NO**
G	**Anaemia:** fatigue, malaise**,** palpitation, easy fatigability, pallor		
G	**Allergy: (Food, Drug)**		
	Fever		
System review:			
Psychiatric:		**YES**	**NO**
Ps	Insomnia		
Ps	Anxiety		
Ps	Depression		
Ps	Medications		
Ps	Hyperactivity		
Ps	**Stress**		
Ps	**Abnormal behavior**		
Neurological:		**YES**	**NO**
N	Headache		
N	Seizures		
N	Paralysis		
N	Tremor		
N	Blackout		

Category	Symptoms	YES	NO
ENT:		**YES**	**NO**
Peripheral V	Recurrent **middle ear effusion**		
Peripheral V	Sneezing, nasal obstruction		
Ocular:		**YES**	**NO**
Oc	Diminution of vision, recent change of eye glasses,		
Oc	Pain, redness		
Cardiovascular (Heart):		**YES**	**NO**
CVS	Chest pain, Irregular heart beat (arrythmias), cyanosis, dyspnoea		
Respiratory:		**YES**	**NO**
Resp (hypoxia)	Wheezing, cough shortness of breath, dyspnoea		
GIT:		**YES**	**NO**
G	Decreased appetite, Weight loss, vomiting		
Endocrine:		**YES**	**NO**
E	**Thyroid** (**hyperthyroidism**: anxiety, tremors, weight loss ……..…..) **Hypothyroidism (laziness decreased appetite…..**		
E	**Diabetes** (Loss of weight, polyuria, polydypsia, hyperphagia……..)		
History of drugs previously taken: ……			
Family history: Has anyone in the family ever been diagnosed with, or suffered from:		**YES**	**NO**
N	**Neurological** disease or disorder		
Ps	**Psychiatric** disease or disorder		
E	**Diabetes**, Low blood sugar		
CVS	High **blood pressure**, Low blood pressure		
Resp	**Asthma**		
Oc	**Ocular**		
V	**Vestibular**		
Peripheral V	**Ear/Hearing problems**		
Congenital	Others: **Consanguinity**	**YES**	**NO**
	Degree		

Thank you for your co-operation.

Key: V= vestibular**; N=**neurological**; G=** general**; Oc=** ocular**;**
CVS= cardiovascular**; Ps=** psychological**; Cervical=**cervical**.**

N.B. The number refers to the number of the scored question in the present history.

Appendix 2. Arabic Children Dizziness Questionnaire

أسئلة استبيان الدوار/ الدوخة عند الأطفال		
اسم الطفل المريض: السن تاريخ الميلاد تاريخ الفحص: التليفون: الشخص الذى اكمل الاستبيان: مستوى التعليم (الوظيفة):		
يرجى الإجابة على جميع الأسئلة : ضع علامة صح على الإجابة الصحيحة و اكتب إجابات بعض الأسئلة و علم على الإجابة الصحيحة في بعض الأسئلة:	نعم	لا
وصف الدوار الخاص بالطفل		
• هل تدور ، العالم يدور إحساس بالدوامة		
• إحساس بالتحرك صعودا وهبوطا - إحساس بالتحرك جنبا إلى جنب-إحساس بالتحرك للامام و الخلف		
• إحساس بالضعف أو قرب الاغماء أو خفة الرأس		
• الانقطاع او التعتيم		
• الغشيان -الوقوع أو السقوط		
• صعوبة و عدم اتزان في المشي		
• صعوبة و عدم اتزان في المشي في الظلام		
منذ متى؟ متى كانت أول مرة شعرت فيها بالدوار؟ (المدة)		
هل تحدث الدوخة في صورة نوبات؟ متكررة؟		
• بداية كل نوبة		
• مفاجئة		
• تدريجية		
كم من الوقت تستمر نوبة الدوار		
• ثواني		
• دقائق		
• ساعات		
• أيام		
أول مرة تحدث لك النوبة؟ كم غالبا ما يكون لديك نوبات دوار؟		
• تتزايد		
• تقل		
• ثابتة		
شدة كل نوبة		
• تتزايد		
• تقل		
• ثابتة		
هل تشعر بدوخة بين النوبات؟		
قبل النوبة :		
• عدوى فيروسية (البرد -- انفلونزا) / أعراض اضطراب الاذن (ضعف سمع –طنين –افرازات-الم)		
• مقدمة للأعراض (خوف من الصوت أو الضوء)		
:ما الذي يجعل الدوار/ الدوخة أسوأ أويجلبه؟		
• الجوع-الأكل		
• شرب القهوة الشاي الكولا أكل الشوكولاتةا		
• بعض المواد الغذائية المملحة	نعم	لا
• الوقوف - الوقوف بسرعة التحرك من الاستلقاء الى الجلوس أو من الجلوس إلى الوقوف		

• حتى عند الاستلقاء و عدم الحركة		
• عند تغيير في بعض مواضع الرأس أو دوران الرأس		
• السعال والعطس الإمساك		
• الغوص		
• ركوب الطائرة		
• وسائل النقل		
• الأصوات الصاخبة		
• الإرتفاعات الشاهقة المرتفعات		
• فرط التنفس		
• التفكير الإجهاد الذهني		
• المجهود الجسدي التعب أو الإرهاق		
• الأسبرين أو مسكنات الآلام		
• مهدئات أدوية منومة حبوب الهلوسة		
• بعض المضادات الحيوية الوريدية		
ما الذي يجعل الدوار / الدوخة تتحسن أو تختفي؟		
• لا شيء		
• بعض الأدوية		
• الأكل		
• الجلوس ساكنا النوم الراحة		
• التحرك من الوقوف إلى الجلوس أو الاستلقاء		
• عند تغيير وضع الجسم أو مواضع الرأس أو عدم تحريك الرأس		
الأعراض المصاحبة للدوار / للدوخة:		
• شحوب لون الجلد برود الأطراف تعرق		
• زرقة بالجلد		
• صعوبة في التنفس أو ألم بالصدر		
• خفقان		
• غثيان قيء		
• زغللة بالعينين		
• ألم بالرقبة أو تصلب		
• الصداع النصفي - صداع (شديد ، متكرر)		
• ارتباك-واضطراب أو فقدان الوعي فقدان الذاكرة		
• نقص حس أو خدر حول الفم أو اليدين أوالساقين		
• تشنجات في الذراعين أوالساقين		
• صعوبة في الكلام - صعوبة البلع - احتناق		
• عدم التناسق أو الترابط في الحركات (تراجع في القدرة على خلع الملابس و ربط الأزرار)		
• قلق		
• اكتئاب		
• رهبة خوف		
• ضعف أو تدهر البصر عدم وضوح بالرؤية		
• زغللة بالعينين- رؤية مزدوجة (حول) - ذبابة أمام العدسة (بقع أمام العين)		
• فرط الحساسية للضوء		
• فرط الحساسية للصوت		
• فقدان السمع أو تغيير في السمع أو شعور بكتمة أو امتلاء الأذن (يمين / يسار؟)		
• طنين في الأذن		

• افرازات من الأذن		
أعراض الأذن		
هل لدى الطفل فقدان للسمع؟		
· في الأذن اليمنى؟		
· في الأذن اليسرى؟		
· في كلتا الأذنين؟		
· إذا كان الجواب نعم يرجى وضع دائرة أى الأذنين أضعف(اليمنى أم اليسرى)		
هل يتقلب يتغير السمع (اليمنى أم اليسرى)		
هل لدى الطف طنين في الأذن		
• في الأذن اليمنى؟		
• في الأذن اليسرى؟		
• في كلتا الأذنين؟		
إذا كان الجواب نعم يرجى وضع دائرة أى الأذنين الطنين بها أكثر(اليمنى أم اليسرى)		
أذكر كل الأدوية التي يأخذها الطفل		
هل يأخذ الطفل أدوية بديلةلأي نقص لديه؟		
هل لدى الطفل مرض وراثي مولود به؟		
هل لدى الطفل عيب خلقي بالأذن؟		
هل للدوار تأثير على:		
• المدرسة والتعليم		
• الأنشطة اليومية		
تاريخ النمو		
	نعم	لا
هل تأخر هذا الطفل في مهارات الفهم بالمدرسة أو باللعب		
هل تأخر هذا الطفل في النطق و اللغة و الكلام		
هل يعانى هذا الطفل هذ من صعوبة في التعليم (متأخر دراسياً بالمدرسة)		
هل لدى هذا الطفل أى سلوك نفسي غير طبيعي (فرط حركة – توحد ، كسل، كثير النوم ، عدواني، يعاني من تبول لا إرادي)		
التاريخ الطبي المرضي		
أثناء الحمل به	نعم	لا
هل كان هناك أي مشاكل مع الحمل؟ هل تعاني الأم من مرض القطط (السيتوميجالو فيروس)		
هل تناولت الأم أي أدوية أو كحوليات أثناء الحمل به		
عند الولادة:		
حالة الطفل عند الولادة (هل ولد هذا الطفل غيرمكتمل النمو (ولد قبل الميعاد المتوقع) ، هل تعرض هذا الطفل للصدمات أو كان هناك نقص أوكسجين أثناء الولادة؟ هل ولد هذا الطفل ناقص الوزن، هل كان لون الطفل - أصفر- أزرق – شاحب ؟ هل اجرى له أي نقل دم ؟)		
التاريخ الطبي للطفل بعد الولادة:	نعم	لا
هل اجرى أي عمليات جراحية بعد الولادة ؟	نعم	لا
هل اجرى أي عمليات بالأذن		
هل اجرى أي عمليات بالرأس		
هل اجرى أي عمليات بالعين		
هل اجرى أي عمليات جراحية أخرى		

هل تعرض هذا الطفل للصدمات(الإصابات) بعد الولادة	نعم	لا
هل تعرض هذا الطفل للصدمات بالأذن		
هل تعرض هذا الطفل للصدمات بالرأس هل كان الطفل فاقد الوعي		
هل تعرض هذا الطفل للصدمات بالعين		
هل تعرض هذا الطفل للصدمات غير ذلك		
هل تعرض هذا الطفل لأصوات شديدة العلو	نعم	لا
هل عانى الطفل من أي أمراض؟.	نعم	لا
أعراض عامة		
هل لدي الطفل اليرقان		
هل عانى الطفل من أى حساسية؟ إذا كان الأمر كذلك ، ما هو / اى حساسية؟		
هل عانى الطفل من ارتفاع درجة الحرارة (الحمى)		
➢ أعراض اضطرابات سلوكية	نعم	لا
هل طفلك لديه صعوبة في النوم- أرق		
هل طفلك لديه قلق		
هل طفلك لديه اكتئاب		
هل طفلك يأخذ أدوية لهذا		
هل طفلك يعاني من إجهاد		
هل طفلك لديه نشاط زائد		
هل طفلك لديه سلوك غير طبيعي		
➢ أعراض اضطرابات عصبية	نعم	لا
هل طفلك لديه صداع- كيف كانت المعالجة؟		
هل عانى الطفل من التشنجات		
هل كانت التشنجات مرتبطة بارتفاع درجة الحرارة		
هل طفلك لديه شلل		
هل طفلك لديه رعشة		
هل طفلك لديه نوبات تعتيم فقد الرؤية		
➢ أعراض اضطرابات بالأذن أو بالأنف	نعم	لا
هل يعانى الطفل من التهابات متكررة بالأذن		
هل يعانى الطفل من انسداد بالأنف –رشح- عطس		
أعراض اضطرابات بالعين	نعم	لا
هل يعاني من مشاكل الرؤية - فقدان البصر - هل حدث تدهور في مقاس النظر في الفترة الأخيرة و تغيير النظارة		
هل يعاني من مشاكلي العين احمرار ألم		
➢ أعراض اضطرابات بالقلب و الدورة الدموية	نعم	لا
هل طفلك يعاني من ألم بالصدر- عدم انتظام ضربات القلب – زرقة بالجلد سهل التعب		
➢ أعراض اضطرابات بالجهاز التنفسي	نعم	لا
هل طفلك يعاني من سعال - الصفير- ضيق في التنفس		
➢ أعراض اضطرابات بالجهاز الهضمي	نعم	لا
هل طفلك يعاني من آلام البطن- انخفاض الشهية – فقدان الوزن – القي		
➢ أعراض اضطرابات بالغدد الصماء	نعم	لا
هل يعاني من مرض السكري : زيادة أكل – و شرب الماء بكثرة - اتبول بكثرة-- فقدان الوزن		
هل يعاني من مشاكل الغدة الدرقية: -فقدان الوزن – قلق – رعشة / كسل عدم نشاط فقدان الوزن		

		اذكر ما الأدوية التي أخذها الطفل من قبل؟ ....
		تاريخ المرض العائلي
		هل أي شخص في العائلة فى أي وقت مضى تم تشخيص ، أو يعاني من:
		• مرض عصبي
		• اضطراب نفسي أو عاطفي
		• ارتفاع أو انخفاض ضغط الدم
		• مرض السكري أو انخفاض السكر بالدم
		• الربو
		• مرض بالعين
		• خلل بجهاز الإتزان
		• مشاكل بالأذن أو السمع
		هل هناك قرابة بين الوالدين ؟
		➢ الدرجة

وشكراً لحسن تعاونكم