Concurrent symptoms and disease conditions in sudden deafness

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Abstract

Objective To study concomitant symptoms and disease conditions in sudden deafness.

Methods Clinical data of 418 cases of sudden deafness treated in this department from 2000 to 2007 were reviewed.

Results Of the 418 cases, 201 were males and 217 were females. Right ear was involved in 184 cases and left ear in 191 cases. Bilateral involvement was seen in 43 cases. The average age was 44.1 years. Tinnitus was reported in 369 cases (88.3%) either before or after hearing loss, of which 64.5% was of low pitch, 27.1% of high pitch and 8.4% of mixed tones. Constant tinnitus was reported in 83% of the cases, and muffled feelings in 33.3% of the cases. Hearing loss was the only complaint in 221 cases (52.9%). Dizziness was reported in 77 cases (18.4%) and vertigo attacks in 120 cases (28%). Hypertension, coronary artery disease and diabetes were found in 19.6% of 418 cases and hyperlipidemia in 54.5% of 211 cases. CT and/or MRI data were available in 147 cases, with positive findings in 18 cases (12.3%): 2 with acoustic neuroma (1.36%); 4 with emphraxis in the basal ganglia, cerebellum, temporal lobe or parietal lobe, and 12 with poor pneumatization of ipsior contralateral mastoid cells.

Conclusion In this case series of sudden deafness, low-pitch constant tinnitus was a common complaint. Most of the studied cases presented with simple hearing loss. Vertigo attacks were more common than dizziness in this group of patients. The most common concomitant disorder was hyperlipidemia, especially high triglycerides. Imaging studies are important in managing sudden deafness in ruling out acoustic neuroma and other intracranial diseases.

Key words Sudden deafness, Constituent ratio, Concomitant disorder

Introduction

Sudden deafness is defined as hearing loss of 20 dB at 2 or more consecutive frequencies of unknown causes that takes place within 3 days. It is a common ear disease and can have serious hazardous effects on patient’s hearing. Because it is often accompanied by tinnitus, muffled sensations, vertigo/dizziness, nausea, vomiting and other symptoms, it can be confused with otitis media, Meniere’s disease, gastroenteritis, or cervical spondylosis. Some patients will suffer from persisting sequelae despite aggressive treatments, including permanent hearing loss and tinnitus. We report a review of 418 cases of sudden deafness, focusing on complicating symptoms and concurrent disease conditions.

1 Clinical data and methods

1.1 Clinical data

Based upon the diagnostic criteria for sudden deafness (1), 418 cases were identified among patients admitted to our department from 2000 to 2007. The age range of this group was from 6 to 80 years with the average at 44.1 years. The hearing loss was monaural in 375 cases and binaural in 43 cases. Treatment was initiated within two weeks of sudden deafness onset in all cases.

1.2 Research Methods

Retrospective review of clinical data with statistical
analysis.

2 Results

2.1 Of the 418 cases, 201 were men (48.1%) and 217 were women (51.9%). Hearing loss was on left in 191 cases (45.7%), on right in 184 cases (44%), and involved both ears in 43 cases (10.3%).

2.2 Concomitant symptoms: Tinnitus before or after hearing loss was reported in 369 cases (88.3%), with low pitch tone in 64.5% of the cases, high pitch tone in 27.1% of the cases, and mixed tones in 8.4% of the cases (Figure 1). In 83% of these cases, tinnitus was constant. Other symptoms included muffled sensations (n=139, 33.3%) and vertigo or dizziness (n=197, 47.1%).

2.3 Types of presentation: Based upon the presence of co-existing dizziness or vertigo, three types of presentation were recognized. In the 418 cases, 221 (52.9%) presented with only hearing loss with no accompanying dysequilibrium (the simple type), 120 (28%) reported vertigo attacks during the disease course (the vertigo type), and 77 (18.4%) complained of dizziness (the dizziness type). Of the vertigo type cases, 22.5% had been misdiagnosed as Meniere’s disease, gastroenteritis, or cervical spondylisis prior to presentation.

2.4 Concomitant disorders

2.4.1 Lipid metabolism disorders: Lipid tests were conducted in 211 cases and showed abnormal blood lipids in 123 cases (58.3%). Of these cases, 24 (19.5%) showed high cholesterol and triglycerides (HTG + HCH), 19 (15.5%) showed high cholesterols (HCH), and 72 (58.5%) showed high levels of triglycerides (HTG). Lower than normal levels of cholesterols and/or triglycerides (LTG + LCH) were seen in 8 cases (6.5%) (See Figure 2).

2.4.2 Coexisting cardiovascular and diabetic conditions: 82 cases (19.6%) were found to have coexisting cardiovascular and diabetic conditions, including hypertension (n=25), coronary heart disease (n=13), diabetes (n=22), hypertension + coronary heart disease (n=3), hypertension + diabetes (n=11), coronary heart disease + diabetes (n=5), and hypertension + coronary heart disease + diabetes (n=3). In contrast, 115 (54.5%) of the 211 cases tested for blood lipids demonstrated hyperlipidemia, indicating higher prevalence of hyperlipidemia than hypertension, coronary heart disease and diabetes in this series of sudden deafness ($P < 0.01$).

2.4.3 Intracranial and other diseases: CT and/or MRI scans were available in 147 cases, of which 18 (12.3%) were normal. Abnormalities included acoustic neuroma (n=2 or 1.36%), multiple emphraxis in the basal ganglia, cerebellum, temporal lobe or parietal lobe (n=4) and poor pneumatization of mastoid cells (n=12) in the absence of history of otitis media. A patient was initially diagnosed with acoustic neuroma based on MRI scans, but subsequent CT scans showed no obvious abnormality. Surgical exploration later revealed a small size acoustic neuroma.

2 Discussion

In recent years, the incidence of sudden deafness has been gradually increasing. Sudden deafness has become a common emergency in E.N.T. practice. The causes of the disease are still unclear. Its features and therapies need to be thoroughly studied. It has been found that sudden deafness affects mostly those in their fourth de-
cade of life, involving both right and left ears in equal proportions with the same trend in either gender. Our series of 418 cases confirmed these observations. In our series, ear fullness was seen 33.3% of the cases and tinnitus in 88.3% of the cases either before or after hearing loss. Tinnitus was of low–pitch and constant in most of these cases.

Patients with sudden deafness often report dizziness, vertigo, nausea and vomiting. In the clinic, it has been noted that therapeutic outcomes and prognosis in sudden deafness cases with concurrent vertigo are not satisfactory. In this study, based upon the presence of concomitant dizziness, vertigo, nausea and vomiting, the cases were categorized as simple-type (hearing loss only), dizziness–type (with dizziness and sometimes nausea and vomiting) and vertigo-type (with vertigo attacks and often nausea and vomiting). Vestibular function tests were mildly abnormal in the dizziness-type cases and showed severe abnormality in the vertigo type cases. Most of our 418 cases were of simple-type (52.9%), followed by the vertigo-type (28%) and dizziness-type (18.4%). Some of the vertigo-type cases (22.5%) had been misdiagnosed as Meniere’s disease, gastroenteritis and cervical spondylosis. Such misdiagnosis can lead to treatment delay and loss of best opportunity for treatment. This may be one of the reasons why sudden deafness with vertigo has poor prognosis and treatment outcomes.

Common concomitant disorders in sudden deafness patients include hyperlipemia, hypertension, coronary heart disease and diabetes. Japanese scholars believed that high blood pressure and diabetes were the inducements to senile sudden deafness. Shi found that factors such as alcohol intake, sleep time, indices of body height and weight, hypertension and diabetes may play a role in the pathogenesis of sudden deafness. In our series, hyperlipidemia was more common than hypertension, coronary heart disease and diabetes, of which more than half (58.5%) was high triglycerides. Hyperlipidemia can lead to atherosclerosis and high blood viscosity. Lipochondria and microthrombosis can block arterial labyrinth, reduce blood flow through the auditory artery and result in sudden deafness.

In sudden deafness, a defined retrocochlear etiology such as an acoustic neuroma or a demyelinating disease can be identified in about 1% of the cases. Approximately 10% of patients with vestibular schwannomas have sudden deafness as the initial symptom. About 3% to 5% of patients with multiple sclerosis have sudden deafness at presentation. Such specific etiologies in sudden deafness need to be identified in the diagnosis process. Hugo found MRI abnormalities in 23 of 49 cases (46.9%) of sudden deafness, including meningioma (n=2), vestibular schwannoma (n=3), microangiopathic changes of the brain (n=13) and pathological conditions of the labyrinth (n=25). Antti indicated that enhanced MRI seemed to be a useful examination in evaluation of sudden deafness, which could not only help identify specific retrocochlear etiologies, but also reveal other peripheral and CNS abnormalities. In the 147 cases in our study that had available CT and / or MRI data, 18 (12.3%) showed anormal results, including acoustic neuroma (n=2, 1.36%), multiple emphraxis in the basal ganglia, cerebellum area, temporal lobe and parietal lobe (n=4), and poor aeration of mastoid cells (n=12) without a history of Otitis Media. In 1 case, an internal auditory canal mass was visible on MRI but negative on CT scans. The lesion was confirmed to be an acoustic neuroma by later surgical exploration, indicating the value of MRI study in sudden deafness as a routine test to rule out medical causes.

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