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OTOLOGY

Meniere's disease: rare or underdiagnosed among Africans

T. S. Ibekwe · G. T. A. Ijaduola

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Abstract Meniere's disease can easily be misdiagnosed because several otological disorders mimic the disease. Conflicting reports on the incidence of this disease among the Africans had been documented. The goal of our study was to verify the prevalence and clinical features of Meniere's disease in WA sub-region. A 10 year (1996–2005) retrospective study carried out in our hospital. The diagnostic criteria for the disease were outlined and Oyedeji's social classification instrument was adapted for socio-economic stratification of patients. The method of treatment and prognostic out-come were discussed. Out of 11,463 patients seen within the period, 25 (16 females and 9 males) met the diagnostic criteria for Meniere's disease. The age ranged from 27 to 75 years (mean = 47.2 SD13.2) and the most predominant age group was 41–50 years. Sixty-eight percent were of low socio-economic class and the rest high. About 84% had unilateral and 16% bilateral Meniere's disease. All the patients presented with tinnitus, vertigo and audiologically confirmed sensorineural hearing loss. CT-scan and MRI were used to rule out some differentials, while caloric and recruitment tests were used to strengthen the diagnosis. Treatment regimen (conservative) outcome: 72% had good improvement, 8% fair, while 20% absconded from follow-up. The prevalence of Meniere's disease in West African sub-region is 0.22%. This prevalence among Africans may not differ from the Caucasians. Under- or over-diagnosis of the disease previously must have been responsible for the contrasting results. Appropriate diagnostic tools are necessary for accurate diagnosis of the disease.

T. S. Ibekwe (✉) · G. T. A. Ijaduola
Department of Otorhinolaryngology,
College of Medicine University of Ibadan,
University College Hospital Ibadan, Ibadan, Nigeria
e-mail: ibekwets@yahoo.com

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Introduction

In 1861, Prosper Meniere; a French physician described a disease condition characterized by episodic vertigo, tinnitus, fluctuating hearing loss and feeling of fullness in the ear. Presently, the disease is named after him. Meniere's disease is composed of both vestibular and cochlear disorders with variations in the mode of presentation. A typical attack is preceded by an unusual and sudden aural fullness which lasts for minutes to hours. Occasionally, visual stimulus may be the first symptom .This episodic disease may occur in clusters, a situation whereby years may pass in between episodes. In other situations tinnitus and imbalance become persistent and are associated with occasional sensorineural hearing loss and severe vertigo [2].

Most of the cases are sporadic, only 5–13% has a familial history of the disease and recently chromosome12p12.3 has been identified as the genetic link [3]. Despite all these advances, the cause of Meniere's disease is not known. Therefore, Idiopathic endolymphatic hydrop as an alternative name still remains valid following the belief that Meniere's disease may be due to abnormalities in the labyrinthine fluid.

About 15% of cases of Meniere's disease are bilateral and the rest unilateral [4]. Studies have also shown that some unilateral cases of Meniere's disease overtly gets to involve both ears after some years of onset (average of 7.6 years) [5]. In most cases, there is no sex preponderance and the commonly affected age group is 20–50 years. Meniere's disease has been identified to account for 2% of vertigo in childhood [6, 7].

Meniere's disease is said to affect 0.2% of the European population [8]. Framingham's study observed that 2:100 Americans (about ten times the documented prevalence rate) believe they are suffering from Meniere's disease [8, 9]. This suggests a considerable chance of misdiagnosis or under diagnosis. Diagnosis can be easily missed because several middle and inner ear disorders mimic Meniere's. In most situations the diagnosis of clinicians remains Meniere's until the differentials are resolved.

Black and Gibson reported the first two cases of Meniere's disease among Africans residing in London in 1982, one of whom was a West African [10]. A year later, Kantabe suggested that Meniere's disease was exceptionally rare in Africans and their descents [11]. The first elaborate work on the prevalence of Meniere's disease in West Africa was done by Okafor [12] in 1984 and he recorded 0.4%. Eight years later, Brobby [13] in Ghana documented 0.32% prevalence rate.

Aside these works done about 2 decades ago in the West African sub-region, no further documented studies on the occurrence of Meniere's disease among the African race were encountered (MEDLINE). Most authors still speculate that this disease is rare among the African race. However, the availability of more sophisticated diagnostic tools in our medical centers may aid in a more accurate diagnosis and thus a difference in the prevalence rate. To this end, our work is set to investigate the prevalence and features of this disease in the West African sub-region, to compare with previous published data.

Methods

This is a 10 year (1996–2005) retrospective study of 11,463 patients seen in the Department of ORL, University College hospital (a tertiary institution and major referral center in the West African sub region). The records of all the patients were screened; those diagnosed for Meniere's disease (25) were further studied. The data retrieved included biodata, clinical presentations, diagnosis, treatment and outcome. The symptoms, treatment and out-come of treatment were further analyzed using the SPSS 11 statistical package.

The diagnostic criteria for Meniere's disease in this study were as follows:

1. Presence of the clinical triad of episodic vertigo, tinnitus and sensorineural hearing loss.
2. Pure tone audiometry to confirm sensorineural hearing loss.
3. Radiological investigations: CT-scans of temporal bones and brain to assess the middle and inner ears and the entire retrocochlear regions to rule out differentials. MRI was done where possible to rule out soft tissue tumours in the cerebello pontine angle.
4. Caloric and recruitment tests were also done to strengthen the diagnosis.

All the patients were graded into social–economic classes using an instrument designed by Oyedeji (Oyedeji's method of socio-economic classification) [14]. The details of the grading are in Table 1.

The pure tone average, air bone gap and the nature of the curve/predominant frequencies of hearing loss were evaluated through pure tone audiogram. The direction and duration of nystagmus were evaluated in the caloric test.

The results were presented in simple descriptive forms, tables and figures.

Results

Out of a total of 11,463 seen within the 10 years study period , a total of 25 patients (9 males and 16 females giving male: female ratio 1:1.8) met the diagnostic criteria for meniere's disease as described in this study. The age of the patients ranged from 27 to 75 years (mean = 47.2 SD13.2). The age group 41–50 was most prevalent and constituted 32% of the entire patients. The details of the disease distribution by age were as shown in Fig. 1. Seventeen patients

Table 1 Oyedeji's Socio-economic classification

Socio-economic class	Occupational scale	Education scale
I	Senior public servants, professionals, managers, large scale traders, businessmen and contractors	University graduates/its equivalents
II	Intermediate grade public servants and senior school teachers	School certificate (Ordinary level GCE) holders who also had teaching/other professional training
III	Junior school teachers, drivers and artisans	School certificate or grade II teachers' certificate holders/equivalents
IV	Petty traders, laborers, messengers and similar grades	Modern three/primary six certificate holders
V	Unemployed, full-time house-wives, students and subsistence farmers	Could either just read or write/illiterates

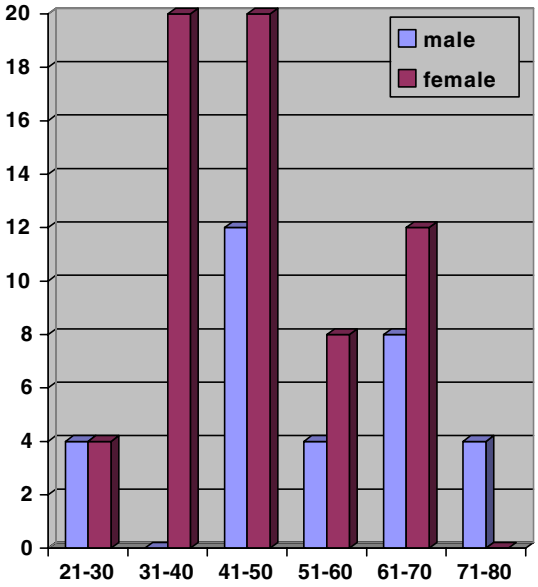

Fig. 1 Age range and gender distribution of Meniere's disease

(68%) belong to the low social class (social class 4 and 5) while 8 (32%) fall into the high social class as illustrated by Fig. 2.

Symptoms/signs

All the patients presented with tinnitus, episodic vertigo and audiologically confirmed sensorineural hearing loss. The pure tone averages of the patients were as follows 21–40 dB (8), 41–55 dB (10), 56–70 dB (5), 71–90 dB (4) and >90 dB (2) ears, respectively. Twenty-one patients (84%) had mid-low frequency hearing loss and the remaining 4 (16%) had high frequency hearing loss. Seven patients (28%) complained of bilateral symptoms. However thorough evaluation revealed that three patients (12%) had unilateral conductive hearing losses. While otitis media with effusion , confirmed through a flat tympanogram tracing (Jerger's type-B curve) [15], was responsible for the conductive hearing loss in one of the patients; the other two were due to persistent subtotal perforations of tympanic membrane following chronic suppurative otitis media. Therefore, only four patients (16%) had bilateral Meniere's disease and 21 (84%) a unilateral disease. Among those with bilateral Meniere's disease, one had the second ear

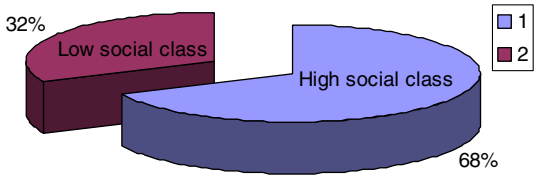

Fig. 2 Social classification of patients with Meniere's disease

involved after about 5 years of onset. The rest commenced simultaneously. The other associated symptoms included: headache in nine patients (36%) and vomiting two (8%). See details in Table 2.

The radiological findings from computerized tomographic scan and magnetic resonance imaging (MRI) of the temporal bone and brain aided the diagnosis and subsequent exclusion of seven patients with cerebellopontine angle tumours. Widening of the internal auditory meatus by noncontrast enhancing isodense mass were the CT findings in six of the seven patients. MRI was done for two patients to confirm vestibular schwannoma. The rest of the patients could not afford MRI. The seventh case had a CT with features of mixed density and brilliant contrast enhancement suggestive of meningioma, which was later confirmed by histology. These cases presented with clinical features similar to Meniere's disease and could have been misdiagnosed but for the radiological investigations.

Recruitment test [17] (a phenomenon of abnormal rise in the perception of loudness of sound after an initial hesitancy by an affected ear following cochlear pathology) was positive for all the patients which helped to rule out sensorineural hearing losses of retrocochlear origin. The caloric tests [18] recorded a reduced duration in nystagmus for both cold and warm waters (duration below 80 s) i.e. canal paresis in 17 patients (9 rights, 7 lefts and 1 bilateral ear) the rests were unequivocal or not done.

Treatment

The diagnosed cases for Meniere's disease were managed conservatively through:

1. Dietary monitoring- salt restrictions and total abstinence from tobacco and alcohol.
2. Drugs–Diuretics (thiazides), peripheral vasodilators (Nicotinic acid) and lorazepam.
3. Analgesics and antiemetics—where appropriate.
4. Physiotherapy-regulated physiotherapy was administered by the physiotherapists for adequate rehabilitation.

Table 2 Frequently associated symtomatology of Meniere's disease

Clinical presentation	No of patients (*n*)	Percentage (%)
Tinnitus	25	100
Vertigo	25	100
Sensorineural hearing loss	25	100
Headache	7	28
Vomiting	2	8
Eye pains	1	4
Foreign body sensation in the throat	1	4

All the patients were placed on regime no. 2 (drugs). Four patients identified as long time smokers, in addition had regime no. 1, while 15 included physiotherapy to their treatment and regime no. 3 were recommended when necessary to all.

None of the patients had endolymphatic surgery or chemical labyrinthectomy.

Follow-up

The outcome of the treatment showed that 18 patients (72%) recorded good improvement as evidenced by 1–4 years symptom free episodes after first 3 months treatment. The serial audiological evaluation (PTA) also showed some improvement on the hearing in the 17 patients with decibel gain ranging from 5–17 db.

Two patients (8%) were vertigo free with reduced frequency of tinnitus and hearing loss after the first 3 months of treatment.

However, the remaining five patients (20%) could not be followed up because they abstained from keeping their clinical appointment.

Discussion

The diagnosis of Meniere's disease requires a combination of good clinical acumen and ability to accurately interpret data from relevant and carefully selected investigative tools. It could be argued that Prosper Meniere, who first made the diagnosis, only did base on the clinical triad of vertigo, tinnitus and sensorineural hearing loss. However, emerging facts have shown that carefully chosen investigations are imperative in the diagnosis of Meniere's disease to rule out the differentials [18]. This is necessary to avoid over- or under-diagnoses of this disease by clinicians.

The 25 patients diagnosed of Meniere's disease in our study gave an incidence of 0.22%. This is lower than values earlier reported by Brobby [13] in Ghana (0.32%) and Okafor [12] in Nigeria (0.4%), respectively (Fig. 3). While the investigative tools used in the diagnosis of Meniere's disease in our study may not encompass all necessary state of the arts equipments needed for such, however; it marked an improvement over those used in the previous studies in the West African sub-region. The inclusion of computerized tomographic scan (CT) and MRI in this study probably made the difference in resolving some differentials that could have been misdiagnosed as Meniere's disease. It is desirable to include evoked response audiometry especially electrocochleography, necessary for the detection of hydrops, in order to confirm Meniere's disease [19], but, this is lacking at present in our centre.

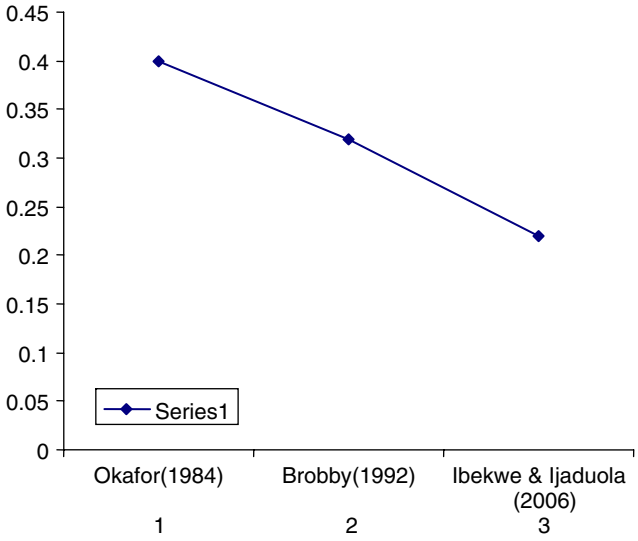

Fig. 3 Prevalence (%) of Meniere's disease in West African subregion

The prevalence rate of 0.22%, as recorded here, is very similar to the 0.2% documented for the Europeans [6, 7]. This may as well suggest that incidence of Meniere's disease among Africans and Europeans are similar, contrary to earlier reports [10–13].

The age group most commonly affected from this study is 40–49 years and this accounted for 32% of all cases. It was also noticed that another 32% were recruited before 40 years (Fig. 1). Therefore , 64% of the cases occurred before the age of 50 years .This is in consonance with the work done by Okafor [12] and Brobby [13] earlier in the West African sub-region. It is also in agreement with findings in other parts of the world: da Costa et al. [20], Lopez et al. [21].

Our findings were in accordance with Okafor [12] and Shojaku et al. [22] who documented a female preponderance of Meniere's disease in West Africa and Asia, respectively. It is at variance with the report of Brobby [13] and Convert et al. [23] which stated equality in gender distribution. The proportion of bilateralism of the disease recorded earlier in the sub-region agrees with the current. However, very high percentage for bilateral Meniere's disease has been documented in other parts of the world. For instance, Mouadebe and Ruckenstein [24] documented 44% in USA.

Commonly incriminated predisposing factors such as alcoholism and cigarette smoking [18] were not quite relevant in this study. None of the 16 females diagnosed for this disease ever smoked cigarette and only four admitted taking alcohol sparingly. Three out of the nine men had never smoked but were social drinkers. Two smoked occasionally while 4 (16%) out of the 25 patients admitted to serious smoking and alcohol consumption.

Most of these patients (68%) belong to the low social class characterized by economic and financial burden culminating in stress and uncertainty in life. Even the high social class admitted to symptoms of the disease worsening while under stress. Thus, we speculate that stress may be a serious predisposing factor to Meniere's disease among the blacks. This is similar to the findings of Brobby in his studies [13].

It was earlier postulated that Meniere's disease among Africans might be very responsive to treatment with a comparatively better prognosis [13]. We were unable to fully substantiate this, since 20% of our patients were lost to follow up. However, within the limit of predictive errors this may be inferred since all but 8% of those followed-up were completely symptom free for 1–4 years after three months therapy.

Our work supports the hypothesis that the prevalence/incidence of Meniere's disease among African descents may not be different from Caucasians. Rather, under- or over-diagnosis of the disease in the past must have been responsible for contrasting opinions. Therefore, awareness and adequate diagnostic tools are necessary for accurate assessment and documentation of Meniere's disease.

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