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MAIN ARTICLE

Age of onset of Ménière's disease in the Netherlands: data from a specialised dizziness clinic

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Abstract

Objectives: To determine the age of onset of Ménière's disease in patients who visited a specialised dizziness clinic, and to verify whether the trend of a delayed onset age of Ménière's disease as reported for the Japanese population also occurs in the Netherlands.

Method: A retrospective data analysis was performed of patients diagnosed with 'definite' Ménière's disease who visited our clinic between January 2000 and December 2013.

Results: Mean onset age of Ménière's disease among the 296 patients was 53.0 ± 14.1 years; 209 patients (71 per cent) were diagnosed between the fifth and seventh decades of life. No trend towards a later onset of Ménière's disease was found (regression beta co-efficient for year of presentation was 0.03; 95 per cent confidence interval = −0.34–0.61; $p = 0.58$).

Conclusion: Ménière's disease has a peak incidence between 40 and 69 years of age. No shift towards a later onset age of Ménière's disease was found.

Key words: Meniere's Disease; Age Of Onset; Classification

Introduction

Patients with Ménière's disease typically suffer from recurrent spontaneous episodes of vertigo, fluctuating hearing loss, tinnitus and aural fullness.[1] However, clinical symptoms vary widely, and most findings are subjective and not specific. In the absence of a diagnostic 'reference' standard, the American Academy of Otolaryngology – Head and Neck Surgery (AAO-HNS) has defined a set of diagnostic criteria for Ménière's disease; these were originally published in 1972 and were updated in 1995.[2] The onset age of Ménière's disease symptoms is variable, but generally incidence peaks in the fourth and fifth[3,4] and seventh[5] decades of life.

Recently, a 24-year retrospective survey conducted in Japan reported a progressive increase in the age at which Ménière's disease manifests itself.[6] This progressive shift towards a later age of onset is explained by the increase of the working elderly population, suggesting that work-related stress contributes to the development of Ménière's disease.[4,6] To the best of our knowledge, studies on the age of onset of Ménière's disease in the Netherlands are lacking. As a result, it is unknown whether a similar shift in onset age towards an older age is also present in the Ménière's disease population in the Netherlands.

In 2000, a multidisciplinary out-patient clinic – the Apeldoorn Dizziness Centre – was established for patients suffering from dizziness. We retrospectively determined the age of onset in patients diagnosed with Ménière's disease. In addition, we analysed whether there was evidence for a delay in the onset age during the 14 years from 2000 to 2013 in Ménière's disease patients who visited our dizziness centre.

Materials and methods

Patients visiting the Apeldoorn Dizziness Centre between January 2000 and December 2013, who were coded as having Ménière's disease, were selected from our database. Data were analysed anonymously and under the supervision of the medical staff.

The AAO-HNS diagnostic criteria for Ménière's disease were used (Table I).[2] No histopathological confirmation was sought in patients meeting the criteria for the diagnosis of 'definite' Ménière's disease; therefore, we did not use the diagnosis 'certain' Ménière's disease. A single attack of vertigo accompanied by unilateral hearing loss was regarded to be clinically more compatible with (viral) labyrinthitis, and therefore patients matching the criteria of 'probable' Ménière's disease were not included into this analysis.

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TABLE I
AAO-HNS 1995 CRITERIA FOR MÉNIÈRE'S DISEASE[2]

Certain Ménière's disease
– Definitive Ménière's disease
– Histopathological confirmation
Definite Ménière's disease
– ≥2 definitive spontaneous vertigo episodes of 20+ mins duration
– Audiometrically documented hearing loss on 1 occasion
– Tinnitus or aural fullness in treated ear
– Other causes excluded
Probable Ménière's disease
– 1 definitive spontaneous vertigo episode of 20+ mins duration
– Audiometrically documented hearing loss on 1 occasion
– Tinnitus or aural fullness in treated ear
– Other causes excluded
Possible Ménière's disease
– Episodic vertigo of Ménière's disease type, without hearing loss, or,
– Fluctuating or fixed SNHL, with disequilibrium but with no definitive episodes
– Other causes excluded

AAO-HNS = American Academy of Otolaryngology – Head and Neck Surgery; mins = minutes; SNHL = sensorineural hearing loss

'Possible' Ménière's disease represents a less well defined clinical entity, and this population may well have vertigo-related diseases (e.g. vestibular migraine).[7,8] Therefore, we only included patients with definite Ménière's disease in this retrospective analysis.

The patient data collected included sex, age, disease code, dates of visits and referral status. Age of onset, Ménière's disease classification, and unilateral or bilateral involvement were determined from the medical information processed in the electronic data handling system. In addition, we analysed audiometric test results, and reviewed letters from the referring general practitioner or specialist, and discharge letters. The year in which vestibular and/or audiological symptoms were first experienced was used to calculate age at onset. Age of onset was classified as unknown if insufficient information was available, e.g. if the medical history was described as 'suffering from Ménière's disease for many years'. We calculated the average degree of hearing loss (for 0.5, 1, 2, 4, 6 and 8 kHz) and the low Fletcher Index (mean over the frequency range 0.5 to 2 kHz), as measured by pure tone audiometry.[9] The checklist for retrospective database studies reported by the International Society for Pharmacoeconomics and Outcomes Research was used as a guideline.[10]

Statistical analysis

We determined the frequencies for sex and bilateral involvement. Means and standard deviations were calculated for the pure tone audiometry results and the onset age of 'definite' Ménière's disease patients. Differences between groups were assessed by cross-tabulation, and analyses were carried out using the chi-square test and *t*-test. To assess the relationship between the year of presentation and age of onset, we visually inspected the data and graphs; if a linear trend was observed, univariate linear regression was used to assess the strength of the relationship. A *p*-value of less than 0.05 was considered significant. The statistical analyses were performed using SPSS® software (version 20).

Results

Of the 7756 patients who had visited the Apeldoorn Dizziness Centre during the study period, 469 patients (6 per cent) were identified as having Ménière's disease. Of these, 67 per cent ($n = 314$) met the criteria for 'definite' Ménière's disease as defined by the AAO-HNS. Slightly more women ($n = 169$, 53 per cent) than men ($n = 145$, 47 per cent) were diagnosed with definite Ménière's disease.

Six of the 'definite' Ménière's disease patients (2 per cent) had bilateral involvement. In two patients, we could not define whether the disease was unilateral or bilateral. In both patients, the attacks of vertigo had started only a few months before their visit to the clinic; the two patients suffered from tinnitus in both ears. As these patients had previously experienced hearing loss, we could not determine which ear was affected. In the patients with unilateral 'definite' Ménière's disease, average hearing loss was 39 ± 14.6 dB and the low Fletcher Index was 40.0 ± 14.7 dB.

We could not determine the age of onset of Ménière's disease in 18 patients (6 per cent). The mean onset age of included patients ($n = 296$) was 53.0 ± 14.1 years (Figure 1). Most patients ($n = 209$, 71 per cent) experienced their first symptoms of Ménière's disease in the fifth, sixth or seventh decades of life.

Both visual inspection and linear regression analysis revealed no relationship between the year of consultation at the Apeldoorn Dizziness Centre and the age of onset (beta regression co-efficient was 0.03 for

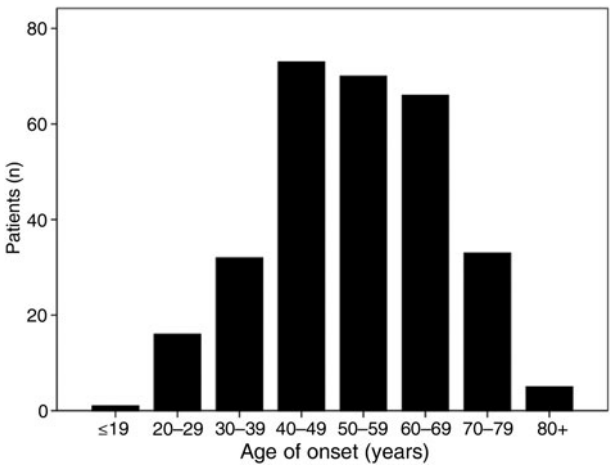

FIG. 1
Age of onset of 'definite' Ménière's disease.

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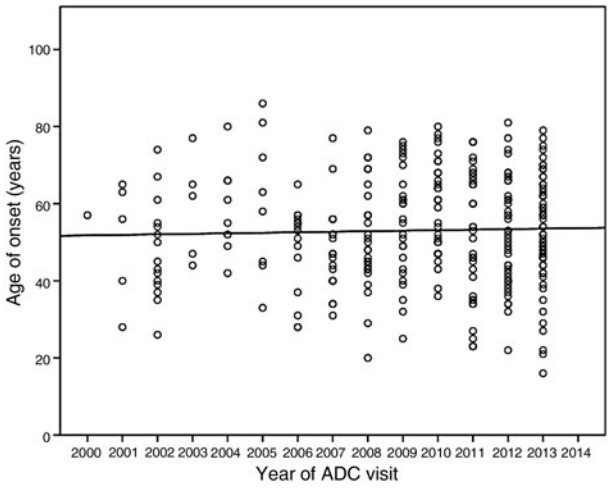

FIG. 2

Scatter plot showing the correlation between year of Apeldoorn Dizziness Centre (ADC) visit and age of Ménière's disease onset. There was no linear relationship between the year of the visit and the onset age (beta regression co-efficient was 0.03 for year of presentation; 95 per cent confidence interval = −0.34–0.61; $p = 0.58$).

year of presentation; confidence interval = −0.34–0.61; $p = 0.58$) (Figure 2).

Discussion

This study investigated the age of onset in 'definite' Ménière's disease patients who visited a specialised dizziness centre in the Netherlands from 2000 to 2013. The incidence of Ménière's disease was found to peak in the fifth to seventh decades of life, which is in line with previous publications.[3–5,11] Our results do not support the suggestion of a progressive delay in onset age of Ménière's disease as reported by Shojaku *et al.*[6]

Several factors may explain our contradictory results. First and foremost, the population aged 65 years or older grew more extensively and more rapidly in Japan than in the Netherlands. Based on StatLine rates,[12] the Japanese population increased by 10.6 per cent during the period 2000–2013 (from 25.5 to 36 per cent). During the same period, the Dutch population grew only by 3.0 per cent, from 20 to 23 per cent. The size of population aged 65 years or older is smaller in the Netherlands, and the increase of this group was less extensive, which may explain the absence of a trend for a forward shift in the peak incidence.

Second, work-related fatigue-inducing delayed onset of the disease does not apply to the Dutch population. The percentage of working elderly is significantly smaller in the Netherlands than in Japan: in the year 2000, this rate was 6 per cent[13] and 22 per cent,[6] respectively. Parallel to the increase of the population aged 65 years or older, the percentage of working elderly grew only by 3 per cent in the Netherlands from 2000 to 2010.[13] Although the life span considerably increased in Japan,[12] it remains disputable as to what extent work-related stress could cause the later onset of Ménière's disease.

Third, Shojaku *et al.* performed their retrospective analysis based upon a 24-year survey starting in 1980.[6] Our data registration started in 2000 and covered a period of only 14 years. The trend for a shift in disease onset towards a later age could have already taken place prior to our study; alternatively, our time window might have been too narrow for a shift in onset age to be evident.

Finally, the Japanese Society for Equilibrium Research criteria for Ménière's disease, established in 1988, differ considerably from those of the AAO-HNS, published in 1995. When applying the Japanese Society for Equilibrium Research criteria, a threshold shift of more than 10 dB for frequencies between 0.5 and 2 kHz as compared to the contralateral side is required for the diagnosis of definite unilateral Ménière's disease. Consequently, those considered 'possible' Ménière's disease patients according to the AAO-HNS 1995 criteria might have been included as definite Ménière's disease patients in the Japanese study.

In our study, males and females appear to be equally affected. This is in line with findings from the USA and Italy.[3,5]

Only 2 per cent of patients in the present study had bilateral involvement; previous studies have reported bilateral involvement in 2–72 per cent of the patients.[14] For instance, Huppert *et al.* reported bilateral involvement in up to 35 per cent of the Ménière's disease cases within 10 years.[15] Disparities in the frequency of bilateral involvement between studies may be explained by variations in diagnostic criteria and disease duration at the time of study participation.[14] Bilateral Ménière's disease rarely starts in both ears simultaneously; rather, it affects ears in a consecutive manner in cases of long-standing disease.[14,15] Our retrospective study design is a less favourable method of analysing this variable; prospective longitudinal assessments were not carried out.

- **Onset age of Ménière's disease in the Netherlands was investigated**
- **Ménière's disease generally manifests itself in the fifth to seventh decades of life**
- **No trend for an increase in disease onset at an older age was found**
- **Bilateral involvement occurred in 2 per cent of the Ménière's disease population**

This study highlights the problems that can be encountered when investigating the age of onset of Ménière's disease. At onset, the disease may be monosymptomatic, with spells of vertigo only; the manifestation of other symptoms may become evident after months to several years.[16] This makes it difficult to determine

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the exact age at which the complete triad of symptoms started. Furthermore, hearing loss can fluctuate in the early stages of the disease.[17] As the diagnostic criteria for Ménière's disease have been redefined over time, and may vary between continents, establishing the onset age of Ménière's disease can be a complex undertaking.

We investigated the onset age of Ménière's disease for patients in the Netherlands. Ménière's disease is generally diagnosed in the fifth to seventh decades of life, and disease onset at a later age is uncommon. We did not find a trend for a forward shift of peak incidence of Ménière's disease. A generally accepted and uniform set of diagnostic guidelines for reporting epidemiological Ménière's disease characteristics is required for the comparison of research data. A prospective, population-based study is recommended to determine actual incidence and prevalence rates, and rates of bilateral involvement, in Dutch Ménière's disease patients.

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