AGE-RELATED HEARING LOSS: IT'S NOT SIMPLE AND IT'S NOT ROUTINE

INTERIM FINDINGS

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Introduction

There is an assumption that hearing loss in older adults is predominantly a gradual, progressive "age-related" hearing loss.

- The standard AQP service specification states: "One in six people in the UK have some form of hearing loss. Most are older people who are gradually losing their hearing as part of the ageing process."
- Epidemiology, based on averaging hearing tests, suggests that most older people have a sloping sensorineural hearing loss (SNHL) (Fig 1)[i] .
- Both the development of prescription formulae[ii] and much of the literature on hearing aids in adults[iii] focuses on mild-moderately severe bilateral SNHL.

However, there are many other causes of permanent hearing loss. Individual pathologies may be relatively rare but, at the population level, we hypothesise that the overall impact may be significant. Additionally, the longer an individual lives, the greater their lifetime risk of acquiring one or more of these pathologies. We believe that this has not been adequately addressed in the literature, and therefore its impact has not been fully considered when designing adult audiology services. We therefore decided to audit the otological pathologies evident in older adults seen in a district general hospital in England.

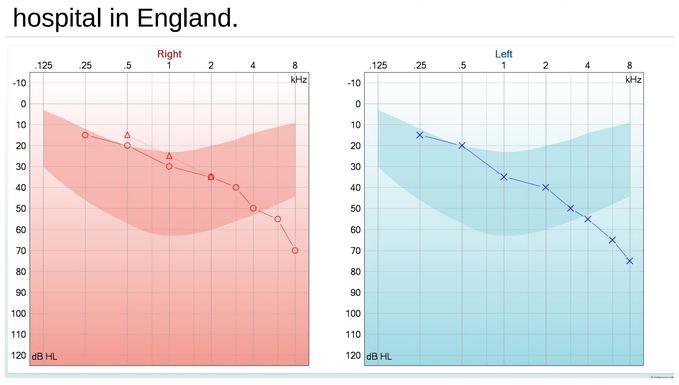

Figure 1

A typical audiogram one might expect from an older adult, based on the epidemiological averaged data.

Method

All adults aged 50 or over who attended for a hearing assessment in the year 2022/23 were assessed via case note review. Audiometry and history were examined.

Patients with either just "age-related hearing loss" (defined as a symmetrical SNHL acquired after the age of 45), noise-induced hearing loss (NIHL) (defined as a symmetrical sloping SNHL with a high frequency notch and a history of noise exposure), or both were combined. It is accepted that audiologically these have similar impacts and management.

Where a patient had any evident additional otological pathology this was identified, and the aetiology or aetiologies recorded. Some pathologies or problems were grouped, where their impact is likely to be similar. Examples are ear surgery (not including mastoid surgery) and cochlear hydrops/Meniere's.

Asymmetrical audiograms with an asymmetry of >40dBHL were also recorded.

Results

There were 1444 attendances for adults aged 50 years or more in the year 2022/23. The data presented here represents the analysis of the first 250 patients. 66% of patients had a pathology that was not just age-related or NIHL (*Fig 2*). The distribution of the most common additional pathologies is shown in *Fig 3*. The full list of additional pathologies identified so far is shown in *Table 1*. 16% of patients have asymmetry of greater than 40dBHL (*Fig 4*). A sample audiogram of one of the patients is shown in *Fig 5*.

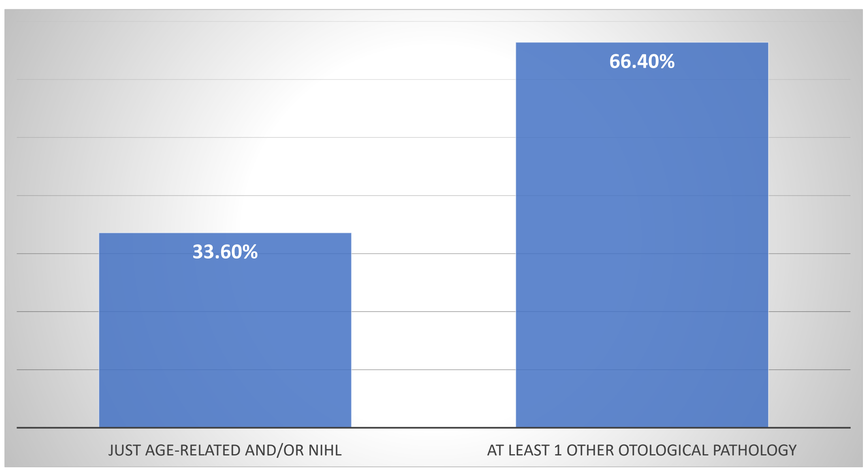

Figure 2

The overall percentage of patients who had either just age-related loss and/or NIHL.

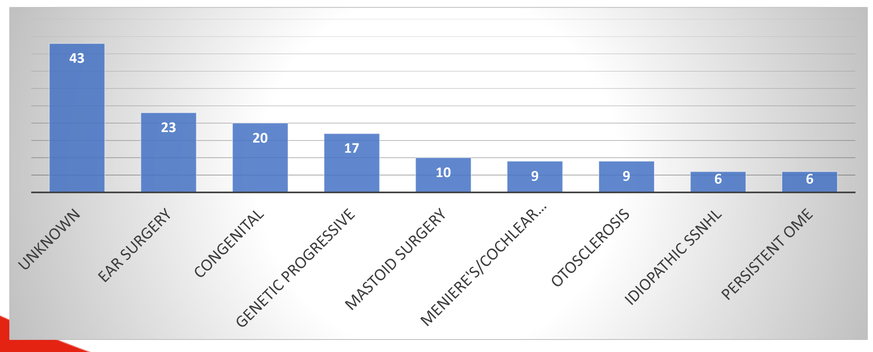

Figure 3

The most common additional pathologies identified, arbitrarily selected as those with more than 5 cases.

Acoustic neuroma	Dermatitis	Measles	Perforation
Barotrauma	Ear surgery	Meningitis	Persistent OME
BPPV	Eczema	NOHL	Rubella
Brain tumour	Genetic progressive	Ossicular discontinuity	Stenosis
Chronic retraction	Idiopathic SSNHL	Other neurological (e.g. MS)	Stroke
Cochlear hydrops	Labrynthitis	Otitis externa	Unknown
Congenital non-syndromic	Mastoid surgery	Otosclerosis	Vascular SSNHL
Congenital syndromic	Meniere's/cochlear hydrops	Ototoxicity	Vestibular migraine
Covid			

Table 1 *List of pathologies identified so far by this audit*

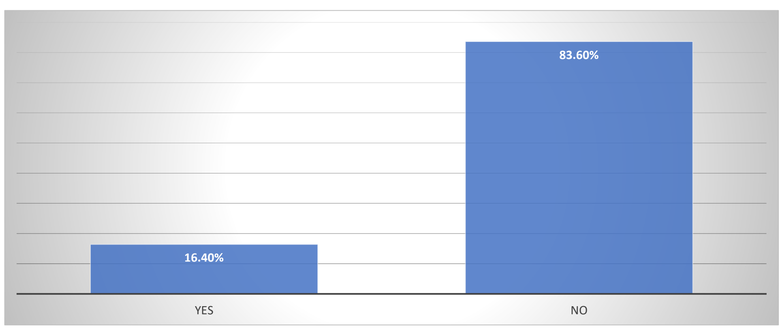

Figure 4

The percentage of patients with an asymmetric hearing loss of greater than 40dBHL

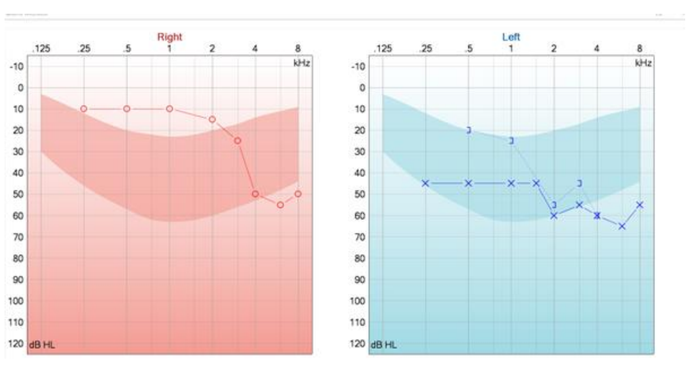

Figure 5

An audiogram from a 62 year old adult who was referred by primary care using an AQP referral form for age-related hearing loss

Conclusions

66% of adults over the age of 50 exhibit at least one otological problem that is not simple age-related change or noise damage. A wide variety of additional pathologies are seen, many of which have implications for hearing aid fitting and audiological management. For example, the most appropriate way to support an individual with Meniere's is not the same as for NIHL, nor that needed for someone with an active perforation.

Audiology services will have standardised protocols for adult hearing aid pathways, and will have selected their preferred hearing aid prescription. However, these may not be well suited for many of the problems individual patients present with. For example, experience would suggest that the recommended gain with NAL-NL2 will not produce a balanced sound with a significant asymmetric hearing loss, but there is no clear evidence base in the literature on how to best manage this.

Clinical Implications

66% of patients audited do not have a simple hearing loss. Therefore, in order to obtain the best outcomes, Audiologists will need careful analysis of the individual's problems, knowledgeable synthesis of the existing evidence base, and intelligent responses to patients' subjective feedback. This requires an educated workforce with sufficient time to ensure that individual patient needs are met.

Limitations of this audit

So far, only 17% of the sample has been audited. This sub-group may not be perfectly representative of the entire caseload.

Other co-morbidities that can significantly increase the complexity of audiological management have not been considered, such as dual sensory impairment, learning disabilities and dementia.

References

[i] Hearing in Adults: A Digital Reprint of the Main Report From the MRC National Study of Hearing; First published online December 20, 2019 Michael A. Akeroyd, George G. Browning, Adrian C. Davis, and Mark P. Haggard
[ii] NAL-NL2 Empirical Adjustments. (21012) Trends in Hearing; 16(4); Gitte Keidser, PhD, Harvey Dillon, PhD, Lyndal Carter, MAud, and Anna O'Brien, MAud
[iii] Evaluation of a semi-supervised self-adjustment fine-tuning procedure for hearing aids; IJA; 2023, VOL. 62, NO. 2, Jonathan Albert Gößwein, Jan Rennies,Rainer Huber, Tobias Bruns, Andrea Hildebrandt, & Birger Kollmeier