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Prescription of binaural hearing aids in the United Kingdom: a knowledge, attitude and practice (KAP) study

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Abstract
The purpose of this questionnaire study was to evaluate the existing knowledge of binaural hearing and the attitudes and practices of prescribing bilateral hearing aids amongst otolaryngologists in the United Kingdom. Of the 950 questionnaires sent to the current members of the British Association of Otolaryngologists and Head and Neck Surgeons (BAO-HNS), there were 591 respondents (62 per cent). The true response rate with completed questionnaires was 59 per cent. Eighty-one per cent of the respondents were aware of the importance of binaural hearing and had a positive attitude towards binaural fitting. The practice of bilateral hearing aid prescriptions was found to be poor amongst all grades on the NHS (less than 10 per cent of all hearing aid prescriptions). This practice in the private sector was variable, dependent largely on patient preference and affordability. The practice of binaural prescription was higher for patients in the paediatric age group than amongst adults. Two common indications for hearing aid prescriptions for unilateral deafness were otitis media with effusion in children (23 per cent of respondents) and for tinnitus masking in adults (12 per cent of respondents). Many otolaryngologists believed that there was not enough evidence to support bilateral bone-anchored hearing aid implantation and bilateral cochlear implantation. Ninety-four per cent of the respondents believed that binaural hearing was as important as binocular vision.

Key words: Hearing Aids; Rehabilitation of Hearing Impaired; Questionnaires

Introduction

Hearing rehabilitation today is a challenge both to the otologist and the audiologist. One is faced with the dilemma of prescribing either hearing aids or offering otologic hearing restoration surgery or more recently, implantation otology. When a decision about hearing aid provision is made, there are more questions to be answered, viz., what aiding strategy to use, one ear or both ears, behind the ear (BTE), in the ear (ITE) or in the canal (ITC) aids, conventional analogue aids or digital aids and so on.

The practice of binaural hearing aid prescription is variable throughout the world. Increased cost is certainly a major deterrent in prescribing binaural aids. There appears to be no consensus opinion regarding guidelines for binaural hearing aid fitting amongst otolaryngologists.

The objectives of this survey questionnaire study were: (1) to evaluate the *knowledge* and *attitudes* regarding binaural hearing of otolaryngologists in the UK and (2) to evaluate the practice regarding the *prescription* of bilateral hearing aids amongst otolarynglogists in the UK.

Materials and methods

A postal questionnaire survey was undertaken between the months of April and August 2000. The questionnaire was first circulated locally amongst 30 practising otolaryngologists. Their suggestions and modifications were incorporated into the final questionnaire. The revised questionnaire (Appendix 1) was sent to all the current members of the BAO-HNS in the United Kingdom.

The questionnaire was designed to assess the knowledge, attitude and practice (KAP) of bilateral hearing aids prescription. Both National Health Service (NHS) practice and private practice as regards hearing aids prescription were evaluated.

Results

A total of 950 questionnaires were sent to all the current members of the BAO-HNS. The total number of respondents was 591 i.e. a 62 per cent response rate. Table I enumerates the different grades of the respondents. Thirty retired consultants returned the questionnaires choosing not to respond to the questions, as they were no longer in practice.

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TABLE I
DISTRIBUTION OF RESPONDENTS

Grades	Numbers responded
Consultants	373
Retired consultants	47 (30 did not answer questions)
Specialist Registrars	101
Senior House Officers	38
Staff Grade surgeons	26
Audiological Physicians	6
Total questionnaires	950
Total respondents	591
Total true respondents	561

The true response rate was therefore 59 per cent (561 correctly completed questionnaires).

Knowledge

Four hundred and fifty-four (81 per cent) of the respondents were aware of the importance of binaural hearing. Of these, 296 were consultant grade, 132 were training grades and the rest other grades. Seventy of these respondents (15 per cent) gave quotes of appropriate literature.[1–5]

Two hundred and six (37 per cent) were aware of studies that showed benefits with bilateral bone-anchored hearing aids (BAHA) (Table II). One hundred and nine (53 per cent) of this group were junior grade and middle grade (staff grade and equivalent) otolaryngologists. Fifty of the 206 quoted literature references and 39 of these were junior grades.[6–8]

One hundred and twenty-four (23 per cent) were aware of studies demonstrating the benefit of bilateral cochlear implants (Table III). One hundred and two of these (82 per cent) were junior and middle grades. However, only 26 gave appropriate references from literature[9] or from conference presentations and clinical trials and all 26 of these were junior grades.

Attitude

Four hundred and fifty-four (81 per cent) of the respondents believed in the importance of binaural hearing. Four hundred and forty (78 per cent) of the otolaryngologists admitted that cost was a limiting factor on the NHS for all types of bilateral hearing aids. However, none of the audiological physicians (six out of six) perceived any financial constraints with bilateral hearing aid prescription provision.

Bilateral bone-anchored hearing aids were not popular with the majority of those who were questioned (Table II). A similar attitude was displayed with regard to bilateral cochlear implantation (Table III). Amongst retired consultants, 81 per cent had no opinion regarding bilateral BAHAs and 87 per cent had no opinion regarding bilateral cochlear implants. Ninety-eight per cent of those respondents, with no opinion as regards bilateral BAHA or cochlear implants, were consultant grade.

An overwhelming 531 respondents (94 per cent) believed that binaural hearing was as important to a patient as binocular vision.

TABLE II
WHAT IS YOUR ATTITUDE AS REGARDS BILATERAL BONE-ANCHORED HEARING AIDS (BAHA) PRESCRIPTION?

Options	No. of respondents (of 561)
I am aware of studies that show benefit	206 (37%)
I do not believe there is sufficient evidence to demonstrate benefit	142 (25%)
I do not believe they work	24 (4%)
I have no opinion	189 (34%)

TABLE III
WHAT IS YOUR ATTITUDE TOWARDS BILATERAL COCHLEAR IMPLANTATION?

Options	No. of respondents (of 561)
I am aware of studies that show benefit	124 (23%)
I do not believe there is sufficient evidence to demonstrate benefit	171 (30%)
I do not believe they work	24 (4%)
I have no opinion	242 (43%)

138 NHS practitioners prescribing bilateral aids

Practice

The prescription of bilateral conventional hearing aids on the NHS appears to be poorly practised amongst all grades of otolaryngologists (Figure 1). However, 100 per cent of the small group of audiological physicians that took part in the survey routinely used bilateral hearing aids.

In the private practice sector, the prescription practice was marginally better than on the NHS amongst consultant grades (Figure 2), understandably due to the affordability of additional costs in this sector.

However, both on the NHS and in the private sector, the majority of the practitioners prescribing bilateral aids (138 of 561 on the NHS and 142 of 396 in the private sector) believed that less than 10 per cent of their prescriptions for hearing aids were for bilateral aids (Tables IV and V).

In response to the use of prescribing guidelines for bilateral hearing aids, only 112 (20 per cent of 561)

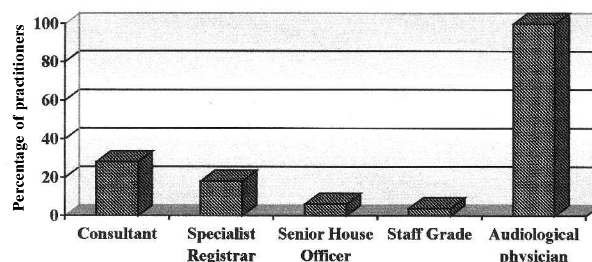

FIG. 1

Do you prescribe bilateral conventional hearing aids in your NHS practice?

110 (28%) of 390 practising Consultants
18 (18%) of 101 Specialist Registrars
3 (6%) of 38 Senior House Officers
1 (4%) of 26 Staff Grade surgeons
6 (100%) of 6 Audiological Physicians

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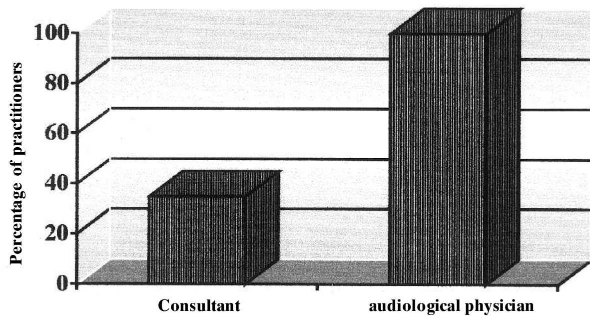

FIG. 2

Do you prescribe bilateral conventional hearing aids in your private-practice?

136 (35%) of 390 practising Consultants
6 (100%) of 6 audiological physicians

of the respondents had any clinical criteria to aid their management decision. Once again, the six audiological physicians interviewed used such audiological criteria. Forty-six per cent of the respondents stated that they referred patients requiring bilateral hearing aids to their local audiologists. Ninety-six (17 per cent of 561) stated that routine prescription of bilateral aids occurred in the paediatric population.

Interestingly, prescription of unilateral hearing aids for both conductive hearing loss and sensorineural loss appeared to be a practised procedure. This was reflected amongst all grades of NHS practitioners (Figure 3). Otitis media with effusion in children was quoted as a common indication for conductive loss (129 of 561 respondents). In the sensorineural group, unilateral hearing aids were prescribed more as tinnitus maskers than aids to hearing (67 of 561 respondents).

Discussion

Hearing aid prescription is perhaps one of the commonest therapeutic interventions in otological practice. Pre-selection procedures, hearing-aid fitting and servicing sessions account for a large proportion of the workload of audiological services rendered. Many hospitals in the UK have a satisfactorily working direct referral hearing aid clinic (DRHAC) managed by a senior audiologist.[10,11] In many regions of the UK community audiologists (first tier) and then hospital-based audiologists (second tier) decide if an ENT specialist consultation is warranted (third tier) in cases with hearing loss. The role of the community-based paediatric audiological services in screening pre-school and school children with hearing impairments cannot be underestimated. Cost issues affect bilateral hearing aid fitting in most state-supported health schemes. However, it is possible that the practice is perhaps determined and dictated by the knowledge and attitudes of the otolaryngologists and audiology team of each region. Nowadays, prescription of binaural hearing aids for children with bilateral otitis media with effusion is an acceptable option.[12] Binaural hearing aid fitting has become more widespread in many parts of the world since coverage for two aids has been approved by the insurers.[13]

Attitudes and satisfaction studies have been undertaken amongst bilateral hearing aid users by several authors. In a study by Stephens *et al.*, 55 per cent of patients in the 50–65 years age group opted for binaural fitting and the choice was made for acoustic reasons, particularly on the basis of improved localization ability.[2] In another trial group most patients preferred binaural aids in quiet situations but monaural aids in noisy environments.[14] A large subjective ratings study of aided hearing ability of binaural hearing aid users compared with monaural hearing aid users and normal

TABLE IV

PERCENTAGE OF HEARING AID PRESCRIPTIONS THAT ARE BILATERAL (NHS PRACTICE)

Percentage prescriptions	Total number of practitioners
100	6
90	3
80	2
70	4
60	4
50	5
40	2
30	5
20	7
10	10
Less than 10	90

138 NHS practitioners prescribing bilateral aids

TABLE V

PERCENTAGE OF HEARING AID PRESCRIPTIONS THAT ARE BILATERAL (PRIVATE-PRACTICE)

Percentage prescriptions	Total number of practitioners
100	6
90	9
80	12
70	10
60	8
50	6
40	15
30	18
20	12
10	12
Less than 10	34

142 private practitioners prescribing bilateral aids

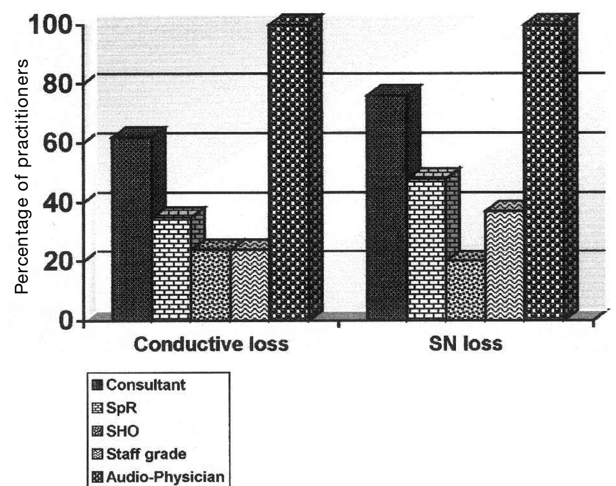

FIG. 3

Prescription of hearing aids for unilateral hearing loss.

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hearing people clearly demonstrated the benefits of binaural amplification in many listening situations.[3] One other NHS postal questionnaire survey among binaural hearing aid users revealed enhanced auditory performance, social competence and personal enjoyment of life![15] In another study 90 per cent of patients in a cohort of 30 bilaterally hearing impaired preferred binaural amplification and the authors concluded that routine practice of fitting monaural hearing aids may not provide optimum benefit.[16]

There are no studies evaluating the KAP of binaural aid prescription in the literature. We undertook the task of evaluating this in an effort to understand the practice as it exists today in theUK. The results of the study threw light on several issue including inadequate knowledge, indifferent attitudes and inconsistent practices as regards binaural aiding. The majority of otolaryngologists of all grades identified financial constraints with bilateral fitting of aids. Interestingly, the financial implication did not appear to be an influencing factor for the audiological physicians.

With the exception of the audiological physicians, few practising otolaryngologists had prescribing guidelines or criteria. However, a significant number (96 of 561 respondents (17 per cent)) of practitioners quoted 'children' under binaural fitting criteria. The Birmingham Otology Group uses the following guidelines for binaural fitting:

(1) bilaterally symmetrical deafness with thresholds (four tone average, 500 Hz, 1, 2 and 4 KHz) within 15 dB of each other;
(2) children with bilateral deafness, both preschool and of school age take preference over adults for binaural fitting;
(3) motivation and patients' professional needs are used as criteria with adults requiring binaural fitting.

Bilateral BAHA fitting and bilateral cochlear implantation are still not acknowledged by most practitioners. Sixteen otolaryngologists expressed concern regarding future technological advances and the difficulties that may be encountered with bilateral cochlear implantees. Many of the retired consultants and some of the practising consultants who chose not to practice otology were reluctant to voice an opinion on some of the questions.

The questionnaire caused an interesting debate and some of the responses are summarized in Appendix 2.

Conclusion

The prescription of binaural hearing aids is poor both in the NHS and to a lesser extent in private practice. Financial constraints and an apparent lack of prescribing guidelines appear to be the predominant reasons for the low rate of bilateral aid prescription. Hearing aid prescription for unilateral hearing losses is practised in many parts of the country but the attitude of many of the practising otolaryngologists towards bilateral BAHA and cochlear implants was indifferent. An overwhelming majority of the practitioners believed that binaural hearing is as important as binocular vision.

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Appendix 1

Questionnaire

1. Please state your job title
2. Are you aware of any studies in the literature that address the importance of binaural hearing? Yes/No
3. Do you prescribe bilateral hearing aids (air conduction) to patients in your practice?
   NHS Practice: Yes/No If yes, what percentage?
   Private Practice: Yes/No If yes, what percentage
4. Do you use criteria/guidelines to prescribe bilateral hearing aids to a patient? Yes/No
   If yes, can you quote any of them?
5. Do you perceive financial constraints with the practice of bilateral hearing aids prescription? Yes/No
6. Would you prescribe a hearing aid for unilateral hearing loss?
   Conductive hearing loss: Yes/No
   Sensorineural hearing loss: Yes/No
7. What is your attitude as regards bilateral bone anchored hearing aids (BAHA) prescription? (Tick one)
   a) I am aware of studies that show benefit (please quote)
   b) I do not believe there is sufficient evidence to demonstrate benefit
   c) I do not believe they work
   d) I have no opinion
8. What is your attitude towards bilateral cochlear implantation? (Tick one)
   a) I am aware of studies that show benefit (please quote)
   b) I do not believe there is sufficient evidence to demonstrate benefit
   c) I do not believe they work
   d) I have no opinion
9. Do you believe binaural hearing is as important to a person as binocular vision? Yes/No
10. Any other comments

Appendix 2

Interesting Responses

About the questionnaire

- *It does not appear that these are properly validated questions. They seem to be professionally constructed to answer your specific issues.*

Bilateral hearing aid prescription in Private practice?

- *I do not have any private pratice. The implications of this question can be ethically challenged.*

Attitude towards bilateral BAHAs

- *Common sense suggests that bilateral aiding is better than unilateral.*
- *We do not have sufficient funds to provide unilateral aids for every hearing impaired person, leave alone bilateral aids.*

Attitude towards bilateral cochlear implants

- *Merely a gut uneasiness about bilateral invasive procedures in a rapidly evolving field.*
- *I do not know if there is any long term damage, say in 20 years, and how easy it would be to remove first generation implants and fit more modern implants in the future*

Do you believe that binaural hearing is as important to a person as binocular vision?

- *This appears to me a weird comparison. It is like comparing apples and oranges.*
- *For a question like this, a non-absolute response should be: Yes/Sometimes/No.*

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