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Towards new criteria for hearing aid recommendation

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Abstract:

Hearing aids have significantly improved in recent times but fitting criteria have not followed technological development. Traditional contra-indications are high frequency hearing losses with normal hearing up to 2kHz, poor speech recognition scores and unilateral hearing losses. A survey sent to 50 otolaryngologists in New South Wales (NSW), Australia, showed that these criteria are still current. This study reviewed 3 groups of patients who have been successfully fitted with hearing aids despite having the above-mentioned audiological characteristics, indicating that criteria for hearing aid recommendation need to be updated.

Keywords: hearing aid, high-frequency hearing loss, unilateral hearing loss, fitting criteria, binaural hearing aid fitting

Introduction:

Despite significant improvement in hearing aid quality, criteria for fitting have not changed much. Hearing losses that could not be fitted in the past, have nowadays a greater range of suitable devices, which might create a successful fitting.

Hearing aids have not been very successful in the past not only due to limited quality of the devices, but also due to lack of training of many dispensers. Several studies (Wernick 1985, Sorri et al 1984, Byrne et al 1972) have shown that many hearing aids ended up in the patient's drawer instead of in their ears. This has created much skepticism regarding their effectiveness not only by the wearers themselves (Van den Brink et al 1996) but also by the medical community.

Furthermore we find that in many instances communication problems caused by a hearing loss are under-estimated not only by the medical professionals but also by the patients themselves. Patients are many times discouraged to try amplification due to "insufficient hearing loss" or poor speech recognition as shown in audiological test results in spite of their complaints of hearing difficulties.

Traditionally the audiological criteria used to recommend a hearing aid are based on hearing threshold and speech recognition scores (speech discrimination). Poor speech

recognition scores and high frequency hearing losses above 2 kHz have usually been considered contra-indications for amplification (Mueller et al, 1991; Van Vliet, 1999). Unilateral hearing losses also have mostly been ignored as one good ear is wrongly considered as sufficient for most situations of communication (Newby & Popelka, 1985).

At Hearing & Balance Centre, we reviewed these criteria by fitting hearing aids to patients whose hearing losses had been considered inappropriate according to the traditional guidelines. The results have been very encouraging as many patients who had been considered unsuitable for amplification in the past are wearing their hearing aids with satisfactory outcome.

One problem we still face is that many of these patients are very skeptical to try hearing aids after being advised against it by their doctors. It is desirable for many patients to hear that a hearing aid is not necessary despite of all the difficulties they have been experiencing and this is most likely due to the stigma associated with hearing aid usage. This makes the process of hearing rehabilitation very difficult at times and more time consuming.

Materials and Methods

We collected a sample of 4 case studies (appendix II) of patients with hearing losses that typically fell outside the traditional criteria for hearing aid candidacy. These cases were used to survey NSW otolaryngologists regarding audiological criteria used to

recommend hearing aids.

The proforma mailed to 50 otolaryngologists chosen at random. We included a letter (appendix I) and the audiograms of 4 patients with their maximum speech recognition scores for right and left ear (appendix II). Each otolaryngologist was asked to tick next to each case if they would recommend a hearing aid for each ear.

Case 1 verifies criterion regarding speech recognition scores, case 2 regarding unilateral hearing loss and cases 3 and 4 refer to high frequency hearing loss with normal hearing levels up to 2 kHz (appendix II).

The case studies used in the survey were of patients who had been fitted with hearing aids binaurally, except for case 2 who obviously was fitted monaurally. All these 4 patients are fully satisfied with the results and wear their devices every day. All the hearing aids fitted were behind-the ear models except for case 2 who was fitted with an in-the-canal hearing aid.

These cases are examples of a larger sample of patients with similar hearing losses who came to our clinic with complaints of communication problems due to hearing difficulties. Most of these patients have been told by their doctors that hearing aids would not be of help (sic).

Results

Twenty-five otolaryngologists replied to the survey and 13 of them added some comments next to their answers, mostly concerned with their perceived need to further investigate the hearing losses.

We apologized in a subsequent letter for the fact that the information supplied did not seem sufficient. We assumed it would be clear that any medical contra-indication would have been previously excluded by a full E.N.T. investigation. This is usually the procedure in every audiology clinic before considering a hearing aid fitting. Some of the replies emphasized the need for a trial before making a decision and again it was assumed that this was also clear, as a 4-week trial period is common practice in audiology clinics.

The survey results seem to confirm patients' claims that their doctors advised them against amplification (See Table 1).

In case 1 a total of 44% of the surveyed doctors would not recommend a hearing aid for the right ear with poor speech recognition scores and 100% of them would recommend for the left ear with good speech recognition.

In case 2 a total of 44% would not recommend a hearing aid for a patient with a mild unilateral hearing loss.

In case 3 only one (4%) of the surveyed doctors would recommend binaural hearing aids for a patient with a mild bilateral high frequency loss above 2kHz, while the remaining doctors would not recommend an aid for either ear.

In case 4 only 12% would recommend a hearing aid for the right ear with a severe high frequency loss above 2kHz and 64% would recommend amplification for the left ear with a sloping mild to severe sensorineural hearing loss.

Conclusion:

Our survey results seem to confirm our patients' claims that amplification had not been recommended for their hearing losses if they did not fall into the traditional criteria for hearing aid recommendation.

Our group of patients however defies traditional criteria as they all obtained satisfactory results from hearing aid fitting. Our challenge now is to redefine audiological criteria to keep up with technological development. Many hearing losses that could not be successfully fitted in the past have now a wide range of suitable hearing aids available from different manufactures.

Based on this group of patients we concluded that normal hearing up to 2 KHz, poor speech recognition scores and unilateral hearing losses should not be used as criteria against hearing aid recommendation.

Recommendation for a hearing aid trial according to our results should be exclusively based on patient's complaints of hearing difficulties and a desire to try amplification. In our opinion, no hearing loss is too minimal and no speech recognition is too poor to preclude someone from benefiting from hearing aids.

Discussion:

High Frequency Hearing Loss:

The complaints of patients with a high frequency hearing loss, who "*cannot hear in background noise*" are very familiar to audiologists and otolaryngologists, and even more familiar is the advice given: "*there is nothing we can do, you have to learn to live with it...*"

We have to date fitted 87 patients with normal hearing up to 2 kHz as exemplified in case 3 and the 69 of them wear their aids every day. Our results seem to agree with other studies showing that patients with high frequency hearing loss above 2kHz significantly benefit from hearing aids (Beamer et al, 2000).

One interesting aspect to be mentioned is that this particular hearing aid is a behind-the-ear model and despite its unappealing cosmetic characteristics the patients still prefer to wear the hearing aids than suffer the consequences of their hearing losses.

Poor Speech Recognition Scores:

Speech recognition (or speech discrimination) is a well-established criterion relied upon for hearing aid recommendation. This was confirmed by this survey. Hearing aids are not usually recommended if speech recognition scores are poor as shown in case 1.

Our experience however is that some of the programmable and digital hearing aids provide a better signal, which overcome the poor speech recognition as shown in the audiological tests.

The patient in case 1 is a 67 years old woman who suffered from Meniere's disease in the right ear for 29 years, the right hearing has been severely impaired for the last 7 years. She was under the impression that her right ear was “dead” as she could not hear any sound from that side except for constant roaring tinnitus. In the last 12 months she developed Meniere's in the left ear and the hearing rapidly deteriorated to the levels shown in the audiogram. She came to us to fit a hearing aid in the left ear. She was surprised to hear sounds in the right ear during audiometry and even more surprised to be able to understand some of the words during the speech test in that side, although very distorted when compared to the left ear. Binaural speech recognition tests showed a better score (97%) than testing each ear separately. This encouraged us to try binaural fitting, which was very successful, not only to significantly improve her hearing, but also to reduce the tinnitus perception.

Similar to case 1, we have now 39 patients with Meniere's disease showing poor speech recognition test results that have been successfully fitted with hearing aids.

An important aspect to be considered in cases of poor speech recognition is the limitation of the speech tests. This has been largely discussed by Dillon, Byrne and Upfold (1982). They pointed out that factors such as the flat gain-frequency response provided by the audiometer, the presentation level of the speech material which is not always optimal, the small number of items in the words list which give imprecise statistical results together with effects of fatigue and practice effects influence the reliability of speech tests. They conclude in their paper that poor speech discrimination obtained in a clinical test should not preclude anyone from trying a hearing aid, as speech test results are not a good predictor. Our patients' sample confirms their

findings. Several patients with poor speech recognition scores obtained good results with hearing aids.

Unilateral Hearing Loss:

The impact of a unilateral hearing loss, however minimal, has been largely underestimated. Our experience shows that just one normal hearing ear is only sufficient in situations of communication in quiet surroundings. Any amount of background noise is detrimental for speech understanding. A hearing aid in the impaired ear usually improves the ability to hear in background noise and to localize sounds.

Monaural versus Binaural Hearing:

Binaural versus monaural amplification is often also an issue when recommending a hearing aid. Our experience shows that only those patients who present binaural interference during binaural speech tests would not benefit from two hearing aids. Fig. 3 is an example of a patient with relatively symmetrical hearing loss who had her speech recognition significantly decreased by binaural stimulation. She tried binaural hearing aids with no success. The amplified sounds were perceived much clearer when wearing an aid in the right ear only.

All the other patients with a bilateral hearing loss significantly benefit from binaural amplification. This is especially important in background noise situation where the second ear contributes to improve the signal to noise ratio (Levitt & Voroba 1980, Balfour & Hawkins 1992, Erdman & Sedge 1981,1986). Many patients who complaint

that their single hearing aid does not help in background noise change their minds after trying binaural amplification.

Our experience is consistent with Scheurs & Olsens (1985) findings that monaural fitting is the choice only when there is financial limitation. Unfortunately not all patients are able to afford 2 hearing aids. Kochkin & Kuk (1997) found that patients who were fitted binaurally after a monaural trial perceived their hearing aids to have a higher value (cost vs. benefit).

Although hearing aid trial is still the common practice, the experienced audiologist can often predict who will succeed with a fitting when using the current hearing aid technology. The factors influencing the success of a hearing aid fitting these days are seldom the characteristics of the hearing loss but rather the patient's attitude and motivation. Motivation is in many instances also influenced by professional advice.

Many patients are told after a hearing test that their hearing is normal for their age and therefore a hearing aid is not necessary. The effects of a high frequency hearing loss is well known to impact on social contact due to difficulties to hear in background noise and in group conversation. There are a number of elderly people in the community who totally withdraw from social contact exclusively due to their "normally aged hearing".

Studies on auditory deprivation (Gatehouse, 1996) strongly suggest that the earlier a hearing aid is fitted the better are the chances of preserving auditory cortex function. These findings strongly suggested that senility might have hearing loss as a causative

agent associated with "disuse" of cortical function and withdrawal of social contact.

It would therefore seem reasonable to expand the criteria for recommending hearing aids in order to enable a wider range of hearing impaired patients to experience the advantages of amplification.

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