

BIAP Recommendation 12/6 – 25/4 :

Unilateral Hearing Loss Assessment and Counselling after Newborn Hearing Screening (UNHS)

General foreword

This document presents a Recommendation by the International Bureau for Audiophonology BIAP. A BIAP Recommendation provides a reference standard for the conduct of an audiological or phonological intervention that represents, to the best knowledge of BIAP, the evidence base and good practice concerning the stated methodology and scope of the document at the time of publication.

Although care has been taken in preparing the information supplied, BIAP does not and cannot guarantee the interpretation and application of it. BIAP cannot be held liable for any errors or omissions, and BIAP accepts no liability whatsoever for any loss or damage howsoever arising. This document shall be effective until superseded or withdrawn by BIAP.

Comments on this document are welcomed and should be sent to the Secretary-General of the International bureau for Audiophonology BIAP. The address can be found on the BIAP website at www.biap.org.

Introduction

Until recently most children with a unilateral hearing loss were diagnosed well beyond the age of 6 years and already attending school. With a universal newborn hearing screening program in place using a bilateral up to date hearing screening technique, bilateral as well as unilateral hearing losses are diagnosed within the first few months of life. This requires new and different concepts for the assessment, counselling and rehabilitation of those with a unilateral hearing loss.

Effects of a unilateral hearing loss

Neither audiologists or otolaryngologists nor paediatricians were usually concerned over unilateral hearing losses, other than to identify its aetiology. They also were assuring the parents that there was no handicap. According to their experience a unilateral hearing loss had no effect on the speech and language development of these children.

In contrast to this opinion several studies between 1986 and 1988 show that children with an unilateral hearing loss bear a more than ten times higher risk to fail at least one grade in school. These failures are related to the fact that these children do experience problems in their directional hearing and consequently in their ability to understand speech in noisy situations, as in a regular classroom. These studies additionally name attention and concentration deficits, getting tired in demanding listening situations and a loss of self confidence due to insecurity. Because of the difficulties in directional hearing safety problems for example in the traffic can not be ruled out.

From a neurophysiological standpoint it's also well documented for bilateral hearing losses that if one ear is not integrated in the hearing process because only one ear is fitted with an hearing aid, that may lead to deprivation of the unfitted ear.

Epidemiology

In various publications one can find different prevalence numbers of unilateral hearing losses at the time of birth. Different hearing screening projects in Germany show that around a quarter of the hearing impaired babies identified through NHS have unilateral hearing losses.

There are also estimates that between 5-10% of unilateral hearing losses are progressive and some of them also turning into a bilateral loss.

The causes, the configuration and the severity of the hearing losses seem to be equally distributed comparing unilateral and bilateral hearing losses.

Recommendation

Assessment

a. Anamnesis

Taking the case history, special attention should be given to:

1. Symptoms that can be primarily related to a unilateral hearing loss like:
 - being able to telephone properly only on one of the ears
 - not responding to a wake-up call if sleeping on the good ear
 - reduced directional hearing (being unable to locate a caller in a different room at home or an approaching car in the traffic)
 - problems to understand in noisy situations (family gathering, car, kindergarten, school, church)
 - turning always one specific ear towards the speaker
 - hearing especially bad when having a middle ear ventilation disorder on the good ear
2. Some more unspecific symptoms which maybe connected to unilateral losses like:
 - attention and concentration difficulties
 - school problems, missing information, distracting other pupils
3. Some causes that may lead to a unilateral hearing loss:
 - family history
 - pregnancy (CMV, ...), birth, neonatal period
 - infections during childhood (like mumps, ...)
 - accidents (skull fractures)
 - malformations of the external ear
 - acoustic trauma

b. Examination / Hearing testing

The testing of unilateral hearing losses with young children may be especially difficult because of problems using masking procedures. With babies the diagnostic process may start with a NHS. To find unilateral losses through NHS a protocol that screens each ear separately is necessary. The subsequent audiological diagnostic procedures must follow the same strict time table as with bilateral losses, so that also unilateral losses are diagnosed within the first 6 month of age. All families with a child with a unilateral hearing loss need a thorough counseling by an expert in pediatric audiology. Regardless of further therapeutic procedures a control hearing test should be performed every 3 month during the first year of life then twice a year up to kindergarten, then once a year at least until the end of primary school.

To assess unilateral hearing losses the audiometric testing should regard the best practice recommendations for bilateral losses and additionally it has to factor in:

- measure the hearing threshold always separately on each side including an airconduction and a bone conduction threshold
- using consequent masking with all the hearing test procedures (ABR, VRA, ...),
- aided thresholds on the impaired side can only yield valid results, if the normal hearing ear is properly masked with a headphone
- insert earphones should be preferred (because of a greater interaural attenuation)
- in case of a progressive or newly developed unilateral hearing loss a MRI scan and a vestibular testing is recommended

Concerning therapeutic procedures a categorization of unilateral hearing losses in the following subgroups is helpful (also see the annex on hearing aid fitting):

- Unilateral moderate sensorineural hearing-loss or conductive hearing loss without atresia and normal hearing on the opposite ear
- Unilateral severe and profound deafness and normal hearing on the opposite ear
- Unilateral conductive hearing-loss (e.g. major aplasia, severe ear canal atresia) and normal hearing on the opposite ear

Accompanying and Counselling of the parents (co-operation with commission 25)

When the diagnosis of an unilateral deafness is established, in particular within the framework of a systematic newborn hearing screening program the BIAP recommends the installation of an early parental counselling and support by an expert in paediatric audiology. Also reassuring the parents, that almost all children will learn to listen and to speak like all other children despite their unilateral hearing loss, therefore any overprotection should be avoided.

The program of accompanying parents aims at:

- to listen and to reassure the parents confronted with the diagnosis
- to allow them to express their possible concerns or guilt
- to meet their need for information

It will be necessary to explain to the parents the importance:

- of a regular monitoring of the child's hearing in both ears (probably at 6 month, 1 year and if not progressive then at least once a year) by an ORL or paediatric audiologist
- of a monitoring of the development of the prelinguistic communication skills and consecutively the development of speech and language (assessment during the first 3 years, see CT 24)
- of a need to adapt their communication behaviour to the child's needs

Then, it will be necessary to recommend:

- an information of the teacher in kindergarten and in school
- an evaluation of the first steps of knowledge acquisition in school

- an information of potential risks of the practice of extreme sports (risk of head trauma, hypoxia, barotrauma, ...)

Explaining the effects of a unilateral hearing loss the information for the parents and the teachers should include the following considerations:

- Loss of directional hearing
- Safety concerns in the traffic
- Orientations problems when reacting to calling
- Problems to hear and to understand in noisy situations, especially in kindergarten, school (+ entitlement for special integration services)
- Adaptation of the acoustical environment to optimize the auditive reception in every communication situation to enhance speech understanding: e.g. to place the child well in regard to its best ear in the classroom.
- Sound protection for the better hearing ear
- Listening to loud music
- Playing certain musical instruments
- Noise at work or during leisure activities
- Protection of the better ear against ototoxic drugs (also avoiding certain ear drops)
- Effects of an additional conductive hearing loss (e.g. chronic otitis media with effusion)
- Option of fitting technical devices (e.g. hearing aid, FM-system)

References

BIAP Recommendation 25/1, Guidance of parents whose children suffer from hearing impairments

Davis A., Reeve K., Hind S.; Bamford J., 2002, Children with mild and unilateral hearing impairment, in R. Seewald and J. Gravel (eds.), A sound foundation through early amplification: Proceedings of the second international conference (pp. 179-186). Stäfa, Switzerland: Phonak

Ross D.S., Holstrum W.J., Mild and Unilateral Hearing Loss: Summaries of Research Articles, National Center on Birth Defects and Developmental Disabilities, <http://www.cdc.gov/ncbddd/EHDI/unilateralhi.htm>

This recommendation was created and approved in a multidisciplinary cooperation between professionals of all audiophonologic disciplines, which are medicine, pedagogy, speech therapy, psychology and hearing instrument audiology.

The original language of this document is English.

BIAP authorizes the broadcasting of documents available on its Web site but forbids any modification of their contents.

President of the commission 12: Th. Wiesner (Germany)

President of the commission 25: S. Demanez (Belgium)

Members of the commission 12: M. Antoniadis-Hitoglou (Greece), A. Bohnert (Germany), P. Chapuy (France), A. Enderle-Ammour (Germany), M. Delaroche (France), J.P. Demanez (Belgium) , L. Demanez (Belgium), G. Dessy (Belgium), D. Hennebert (Belgium), N. Herman (Belgium), C. van der Heyden (Belgium), A. Juarez Sanchez (Spain), V. Leflere (Belgium), J. Leman (France), Th. Lhussier (Belgium), B. Martiat (Belgium) , N. Matha (France), N. Melis (France), T. Renglet (Belgium), Ph. Samain (Belgium), M.-N. Serville (Belgium), G. Schram (Switzerland), P. Verheyden (Belgium)

Members of the commission 25: M.-H. Chollet (France), M. Drach (Germany), M. Franzoni (France), N. Herman (Belgium), M.-F. Leman (France), S. Quertinmont (Belgium), T. Renglet (Belgium), A. Tarabbo (France), V. Touma (Lebanon)

Bordeaux (France), May 2009

Keywords: assessment, early diagnosis, early intervention, infant, interdisciplinary health team, neonatal screening, parental guidance, unilateral deafness, unilateral hearing loss.