



# Клинические сведения Хронический средний отит и Baḡa®



Система Cochlear™ Baḡa® 3

*Средний отит (СО) – самое распространенное детское заболевание во всем мире. К трехлетнему возрасту более 83% детей хотя бы один раз болели средним отитом, а 46% таких детей болели отитом не менее трех раз. Разные стадии среднего отита диагностируются исходя из степени тяжести клинических проявлений. Стадии среднего отита включают острый средний отит (ОСО), экссудативный средний отит (ЭСО), хронический средний отит (ХСО) и хронический гнойный средний отит (ХГСО). У детей с рецидивирующим течением ОСО, а также у детей, страдающих ЭСО или ХГСО, выше риск развития кондуктивной и сенсоневральной тугоухости. Применение системы Baḡa обладает рядом преимуществ у детей с ХСО и его следует рассматривать в качестве возможного метода лечения детей с флюктуирующей и хронической тугоухостью<sup>7-11</sup>.*

## РАСПРОСТРАНЕННОСТЬ

Во многих странах хронический средний отит относится к числу основных проблем здравоохранения. Распространенность этого заболевания варьирует в диапазоне от <1% до >20% среди разных групп населения. На показатели заболеваемости хроническим средним отитом влияют экономические и экологические факторы<sup>1</sup>.

## ТУГОУХОСТЬ

Средний отит приводит к потере слуха разной степени тяжести. Тугоухость при среднем отите, как правило, кондуктивная, и в основном обусловлена скоплением жидкости в полости среднего уха или разрывом барабанной перепонки. При длительном течении среднего отита развиваются осложнения со стороны слуховых косточек, что в сочетании с персистирующей перфорацией барабанной перепонки усиливает как тяжесть течения заболевания, так и снижение слуха. При формировании в полости среднего уха холестеатомы или грануляционной ткани степень снижения слуха и разрушения слуховых косточек выражены еще больше<sup>2</sup>.

## ТУГОУХОСТЬ НА ФОНЕ ЭКССУДАТИВНОГО СРЕДНЕГО ОТИТА

Периоды кондуктивной тугоухости на фоне эпизодов среднего отита могут приводить к задержке речевого развития у детей<sup>3</sup>. В ходе недавно проведенных исследований были также установлены связи между эпизодами среднего отита и проблемами обучения, расстройствами внимания и нарушениями социальной адаптации<sup>4</sup>. Кроме того, было обнаружено, что у пациентов, страдающих средними отитами, чаще развиваются депрессивные и тревожные расстройства, чем у людей с нормальным слухом<sup>5</sup>. Перенесенный в детстве средний отит даже после разрешения инфекционного процесса и восстановления порогов слышимости может оставить после себя небольшие, однако необратимые повреждения среднего уха и улитки<sup>6</sup>.

## ПОЛЬЗА ОТ УСИЛЕНИЯ ЗВУКА

Результаты исследований показывают, что у маленьких детей периодическое снижение слуха и ухудшение восприятия речи, обусловленное рецидивирующим течением среднего отита, может

приводить к отдаленным неблагоприятным последствиям, в том числе нарушению формирования навыков общения, задержке развития речи, нарушению обработки слуховой информации, задержке психосоциального и когнитивного развития<sup>3-6</sup>.

Возможность усиления звукового сигнала во время эпизодов среднего отита, сопровождающихся снижением слуха, очень важна. Пациентам с потерей слуха вследствие хронического среднего отита часто требуется пожизненное слухопротезирование.

Поскольку рецидивирующие инфекции уха и выделения из слухового прохода сопровождаются неприятными ощущениями, применение слуховых аппаратов воздушного звукопроводения у таких пациентов крайне затруднено или даже невозможно<sup>7</sup>.

## ЛЕЧЕНИЕ ТУГОУХОСТИ

Применение системы Baḡa у пациентов с хроническим средним отитом характеризуется рядом преимуществ:

- При использовании системы Baḡa в слуховой проход ничего не вставляется. Инфекционный процесс не усиливается, и рецидивирующие выделения из слухового прохода постепенно прекращаются. Результаты исследований показывают, что у пациентов, пользующихся системой Baḡa, уменьшаются выделения из слухового прохода<sup>8</sup>.
- Поскольку детям с рецидивирующим средним отитом крайне важно обеспечить раннее усиление звука во время периодов снижения слуха для предотвращения задержки речевого развития, идеальным решением этой задачи служит использование звукового процессора Baḡa на эластичной ленте Baḡa Softband<sup>9</sup>.
- Снижение частоты рецидивов ушной инфекции у пациентов с хроническим средним отитом, пользующихся системой Baḡa, экономически выгодно для здравоохранения<sup>10</sup>.
- У пациентов с хроническим средним отитом отмечается один из самых высоких уровней удовлетворенности системой Baḡa по сравнению с другими подгруппами, что указывает на существенную пользу от применения Baḡa, которое дает им ощущение комфорта, в том числе физического и социального<sup>11</sup>.

## ЗАКЛЮЧЕНИЕ

У детей с рецидивирующим средним отитом необходимо часто проверять слух, а при обнаружении снижения слуха следует незамедлительно обеспечить усиление звуковых сигналов. Применение системы Ваха у такой группы пациентов характеризуется рядом преимуществ и его следует рассматривать в качестве возможного метода лечения детей с флюктуирующей и хронической тугоухостью<sup>7-11</sup>.

## СПИСОК ЛИТЕРАТУРЫ

1. Prevention of hearing impairment from chronic otitis media. Report of a WHO/CIBA Foundation Workshop. 1996

Abstract not available.

2. Da Costa SS. Sensorineural hearing loss in patients with chronic otitis media. *European archives of oto-rhino-laryngology*. 2009 Feb;266(2):221-4.

### ABSTRACT

Chronic otitis media is generally associated with some degree of hearing loss, which is often the patient's chief complaint. This hearing loss is usually conductive, resulting from tympanic membrane rupture and/or changes in the ossicular chain due to fixation or erosion caused by the chronic inflammatory process. When cholesteatoma or granulation tissue is present in the middle ear cleft, the degree of ossicular destruction is even greater. An issue that has recently gained attention is additional sensorineural hearing loss due to chronic otitis media. While the conductive loss can be minimized through surgery, sensorineural hearing loss constitutes a permanent after effect, attenuated only through the use of a hearing aid. However, a few groups have reported a decrease in sensorineural function in these patients as well. This survey study performed at a referral center evaluates the occurrence of sensorineural hearing loss in ambulatory patients with this disease. We reviewed the files of patients with unilateral chronic otitis media. One hundred and fifty patients met the inclusion criteria: normal otoscopy and normal hearing in the contralateral ear. Main outcome measure: bone-conduction threshold averages were calculated for frequencies of 500, 1,000, 2,000, 3,000 and 4,000 Hz, with comparison between the normal ear and the ear with chronic otitis media. Thresholds were examined separately for each frequency. The bone-conduction threshold averages for the normal side were lower than those for the ear with chronic otitis media. The threshold shift was statistically significant for each frequency ( $P < 0.0001$ , Student's *t* test). There were differences between the groups when analyzed for age (500 and 1,000 Hz) or the presence of cholesteatoma (1,000 Hz). This study shows that chronic otitis media is associated with a decrease in cochlear function.

3. Roberts K. A preliminary account of the effect of otitis media on 15-month-olds' categorization and some implications for early language learning. *Journal of speech, language and hearing research*. 1997 Jun;40(3):508-18.

### ABSTRACT

In the present study, 24 infants 14 to 16 months old ( $M = 15.3$  months) with a history of otitis media (OM) and tube placement were tested for categorical responding within a visual familiarization-discrimination paradigm (cf. Roberts & Jacob, 1991; Roberts, 1995a). Sixteen infants were, on average, 4.6 months post-tubes. At the time of testing, hearing was reported to be normal. During both the familiarization and testing phases, reiterant speech utterances (e.g., "ti ti the sasasa," "bo bo the sasasa," "gu gu the sasasa," "sasasa") were randomly presented contingent on infants' looking at line drawings of selected animals. The inclusion of the article *the* in these utterances provides an important grammatical cue signaling an upcoming noun label. Using these same procedures, utterances, and animal stimuli, normal-hearing 15-month-olds without a reported history of OM had categorized successfully in two previous experiments. In contrast, the OM infants did not respond categorically under these conditions. This suggests that even mild hearing loss may adversely affect categorical responding under specific input conditions and that this effect may persist after normal hearing is restored. A plausible account is that fluctuating hearing loss may cause the low-phonetic-substance article to vacillate above and below some attentional threshold. The resulting inconsistency in the

article's availability would disrupt the co-occurrence relation between the article and cues already connected to joint attentional/referential interactions and categorical treatment of objects (cf. Roberts, 1995a). Such a disruption has implications for the acquisition of words and other aspects of language.

4. Bidadi S, Nejadkazem M, Naderpour M. The relationship between chronic otitis media-induced hearing loss and the acquisition of social skills. *Otolaryngology -- head and neck surgery*. 2008 Nov;139(5):665-70.

#### ABSTRACT

**OBJECTIVE:** To investigate the effects of hearing loss caused by chronic otitis media (COM) on acquiring social skills.

**SUBJECTS AND METHODS:** A case-control study of 90 patients, including patients with COM, age range 15-30 years, was conducted in the otorhinolaryngology ward of Tabriz University Hospital. Social skills were assessed with a social skills questionnaire.

**RESULTS:** Social skill scores were found to be lower in hearing-impaired COM patients compared with the control group ( $P < 0.001$ ). Social skill disabilities in patients with bilateral COM were more severe than in patients with unilateral COM and the controls ( $P < 0.001$ ). Correlation between social skills score and degree of hearing loss was significantly negative ( $P = 0.014$ ,  $\rho = -0.314$ ). These data indicate an inverse relationship between hearing loss and social skills.

**CONCLUSION:** Social skills and educational level of COM patients are affected because of hearing impairment. This study suggests that COM has effects on social development and education.

5. Gouma P, Mallis A, Daniilidis V, Gouveris H, Armenakis N, Naxakis S. Behavioral trends in young children with conductive hearing loss: a case-control study. *European archives of oto-rhino-laryngology*. 2011 Jan;268(1):63-6.

#### ABSTRACT

Otitis media with effusion (OME) is a common condition affecting children and a well-known cause of conductive hearing loss that can potentially lead to speech development disorders. Recent studies, however, have demonstrated the influence of OME on development of attention disorders or social adaptation and acceptance. Hence, this study aimed to investigate the behavioral trends of children with OME based on the Achenbach test. A group of 117 patients with episodes of OME at the age of 4-5 was compared with a control group according to the Achenbach system of evaluation, by application of the Child Behavior Checklist questionnaire (CBCL). Patients suffering from OME had more anxiety/depression related disorders and attention disorders as compared with the control group. The psychological effect of OME in children of ages 6-8 is evident with anxiety and depression disorders being especially prominent among these patients.

6. Yilmaz S, Karasalioglu AR, Tas A, Yagiz R, Tas M. Otoacoustic emissions in young adults with a history of otitis media. *J Laryngol Otol*. 2006 Feb;120(2):103-7.

#### ABSTRACT

The aim of this study was to investigate otoacoustic emissions in young adults who had a history of otitis media (OM) in childhood and to assess whether a history of OM had an irreversible effect on hearing. We studied 116 cases between 15 and 25 years of age, divided into three groups. Each subject underwent a single examination comprising otoscopy, pure-tone audiometry (PTA), tympanometry, and transient evoked otoacoustic emission (TEOAE) and distortion product otoacoustic emission (DPOAE) testing. Subjects in the first and second groups had normal audiometric

hearing thresholds and type A tympanograms. The only difference between the first and second group was the presence or absence of a history of OM. The third group consisted of patients diagnosed as having active OM; these patients had poorer hearing thresholds and type B or C tympanograms. After statistical analysis of TEOAE and DPOAE results (one-way analysis of variance test), significant differences were noted between groups. Otoacoustic emission levels were, unsurprisingly, lowest in the third group, as expected. However, the most striking result in the study was that significantly fewer otoacoustic emissions were detected in subjects with a history of OM than in subjects without a history of OM. These findings suggest that OM in childhood may cause minor but irreversible damage to the middle ear or cochlea. Otoacoustic emissions testing can be used to detect this sub-clinical damage.

7. Gillett D, Fairley JW, Chandrasher TS, Bean A, Gonzalez J. Bone-anchored hearing aids: results of the first eight years of a programme in a district general hospital, assessed by the Glasgow benefit inventory. *The journal of laryngology and otology*. 2006 Jul;120(7):537-42.

#### ABSTRACT

**OBJECTIVES:** To report the clinical results of a bone-anchored hearing aid (BAHA) programme in a district general hospital, compared with those in an established, large, university teaching hospital centre.

**DESIGN:** A retrospective postal questionnaire sent to Baha patients, with two month waiting time and one reminder, combined with case note analysis. Results compared by appropriate statistical tests with published outcomes data from the largest UK series.

**SETTING:** Public sector (National Health Service) district general hospital, England. Catchment population: 300,000 (mixed rural and small towns).

**PARTICIPANTS:** Case note analysis of sixty-three patients implanted between 1994 and 2003 (age range, six to 88 years). The commonest indication was chronic otitis media, with inability to wear a conventional hearing aid. Otitis externa, otosclerosis and sensorineural hearing loss were other indications. The questionnaire was sent to 59 patients who had worn their aid for at least six months; it was returned by 41 (69 per cent).

**MAIN OUTCOME MEASURES:** Glasgow benefit inventory (GBI, change in health status following otolaryngological intervention); incidence of complications.

**RESULTS:** Bone-anchored hearing aid implantation significantly improved quality of life as measured by the GBI ( $p < 0.001$ ). The degree of improvement was similar to that achieved in Birmingham by Proops et al. ( $p > 0.05$ , chi-squared test). Minor temporary skin infection was common (33 per cent). Thickening of the skin around the implant occurred in 17 per cent. One implant (2 per cent) failed. There were no serious complications.

**CONCLUSION:** The Baha is a safe, reliable and effective treatment for selected patients. A successful Baha programme can be run in a district general hospital.

8. Macnamara M, Phillips D, Proops DW. The bone anchored hearing aid (BAHA) in chronic suppurative otitis media (CSOM). *Journal of laryngology and otology supplement*. 1996;21:38-40.

#### ABSTRACT

Bone anchored hearing aids are gaining wide acceptability in the treatment of patients with congenital ear problems, chronic suppurative otitis media (CSOM) and in some cases otosclerosis. To date little information on the effect of the bone anchored hearing aid on the symptoms of chronic suppurative otitis is available. This retrospective study based on notes review and telephone interviews was to assess the outcome of bone anchored hearing aid surgery in patients with CSOM in terms of: ear discharge; surgical techniques and complications;

the number of hours the aid is worn compared with the previous aid. One hundred and forty-two patients were fitted with bone anchored hearing aids without additional prostheses in Birmingham between 1989 and 1995. Sixty-nine (48.5 per cent) of these were for chronic suppurative otitis media, 45 of these were female and 24 were male with a mean age of 58 years. Most (85 per cent) had undergone previous ear surgery with 65 per cent having mastoid surgery. Ninety-eight per cent of this patient group had undergone single stage surgery and 65 per cent under local anaesthetic as a day case. A variety of techniques for soft tissue reduction were employed. The mean follow-up time for these patients was 24 months (range one month to seven years). No patients experienced worse discharge following their Baha and 84 per cent had significantly reduced discharge, 16 per cent had no change. Complications included skin reactions, 15; failure to integrate, one; late loss of fixture, three. Seventy-three per cent wore their bone anchored hearing aid more than eight hours per day and 58 per cent were more satisfied with their bone anchored hearing aid than their previous aid.

9. Ramakrishnan Y, Davison T, Johnson IJ. How we do it: Softband management of glue ear. *Clinical otolaryngology*. 2006 Jun;31(3):224-7.

#### ABSTRACT

The management of refractory glue ear in some groups of children can be challenging. The conventional option of using a hearing aid is sometimes fraught with compliance issues and the need for repeated impressions for hearing moulds. The Softband offers an alternative method of managing refractory glue being safe, well-tolerated, non-invasive and easy to administer.

10. Watson CJ, Silva S, Lawless T, Harling JL, Sheehan PZ. Bone anchored hearing aids: a preliminary assessment of the impact on outpatients and cost when rehabilitating hearing in chronic suppurative otitis media. *Clinical otolaryngology*. 2008 Aug;33(4):338-42.

#### ABSTRACT

**OBJECTIVES:** To compare the difference in ENT and Audiology visits, treatments dispensed and potential savings pre- and post-bone anchored hearing aid (Baha) insertion in patients with chronic suppurative otitis media exacerbated by behind the ear hearing aids.

**DESIGN:** A retrospective pilot study.

**SETTING:** District General Hospital.

**PARTICIPANTS:** All patients who had Baha inserted from January 2001 to January 2006.

**PARAMETERS:** Age, gender, number of visits per month, treatments per month dispensed from the ENT and Audiology Departments and direct and limited indirect medical costs pre- and post-Baha insertion.

**RESULTS:** Twelve of 26 (46%) adult patients had Baha inserted over the 5-year period for CSOM. The male to female ratio was 1 : 3 with a median age of 61 (range 29-81). The number of visits and treatments dispensed per month in the ENT Department fell from a mean of 0.42-0.33 ( $P < 0.08$ ) and 0.22-0.14 ( $P < 0.02$ ) respectively. When the difference in medical cost was taken into account Baha offered a potential saving of pound 627.80 per patient.

**CONCLUSION:** Although the initial acquisition of surgical equipment and Baha sound processors is expensive, there is a reduction in the number of treatments and visits required for patients with chronic suppurative otitis media after Baha is inserted leading to a reduction in average costs.

11. McLarnon CM, Davison T, Johnson IJ. Bone-anchored hearing aid: comparison of benefit by patient subgroups. *Laryngoscope*. 2004 May;114(5):942-4.

#### ABSTRACT

**OBJECTIVES/HYPOTHESIS:** The osseointegrated bone-anchored hearing aid, using the Branemark system, is well established and has proven benefit. The aim was to study quality of life benefits within patient subgroups using the validated Glasgow Benefit Inventory (GBI).

**STUDY DESIGN:** Retrospective questionnaire study.

**METHODS:** Ninety-four consecutive patients were enrolled into the study. Mean patient age was 49 years, with a female-to-male ratio of 1.1:1. Patient subgroups were discharging mastoid cavities, chronic active otitis media, congenital ear problems, otosclerosis, and acoustic neuroma and other unilateral hearing losses.

**RESULTS:** The response rate was 73%. The score for total benefit of bone-anchored hearing aid fitting for the entire group was +33.3 (95% confidence interval [CI], 25-42). Glasgow Benefit Inventory scores for each subgroup were all greater than +20. The congenital atresia group scored highest with +45 (95% CI, 28-61). Variation in benefit across the subgroups has been demonstrated. Fitting of Baha following acoustic neuroma surgery was shown to be of benefit with a score of +22.2. General benefits scored highest in all subgroups compared with physical and social benefits.

**CONCLUSION:** The study demonstrated the differences in benefit within patient subgroups. Its results can be used to give patients a predictive value at the time of preoperative counseling. The study identified congenital ear disorders as the group likely to obtain maximal benefit. Notably, for the first time, the study demonstrated the documented benefit of restoring stereo hearing to patients who have acquired unilateral hearing loss following acoustic neuroma surgery using a Baha.

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