



诺尔康文摘

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成人人工耳蜗康复专题

浙江诺尔康神经电子科技股份有限公司
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前言

随着人工耳蜗技术日渐成熟及临床广泛应用，加上听力行业积极推动听力健康，成人人工耳蜗植入逐渐成为趋势，但目前缺少针对成人植入者的规范康复指引，大多数康复机构亦没有针对成人康复的服务，因此成人植入者大多依靠自主被动或主动康复，康复效果未必能达到自身该有或可以达到的水平。

因此，本文摘使用“人工耳蜗成人康复”、“adult aural rehabilitation”等关键词进行文献检索，最终收录并翻译16篇国内外针对成人人工耳蜗植入者听觉、言语、音乐等方面的康复工具及效果相关文献，研究均显示成人植入者经过系统康复，能提升听声识别率、言语发音能力、音乐享受程度、生活质量等，验证了成人康复的必要及重要性。

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文献摘要

(一) 康复工具及效果—听觉

Postoperative Rehabilitation Strategies Used by Adults With Cochlear Implants: A Pilot Study

Michael S. Harris, MD; Natalie R. Capretta, BS; Shirley C. Henning, MS, CCC-SLP; Laura Feeney, AuD; Mark A. Pitt, PhD; Aaron C. Moberly, MD

Abstract

Objectives/Hypothesis: Aural rehabilitation is not standardized for adults after cochlear implantation. Most cochlear implant (CI) centers in the United States do not routinely enroll adult CI users in focused postoperative rehabilitation programs due to poor reimbursement and lack of data supporting (or refuting) the efficacy of any one specific approach. Consequently, patients generally assume a self-driven approach toward rehabilitation. This exploratory pilot study examined rehabilitation strategies pursued by adults with CIs and associated these strategies with speech recognition and CI-specific quality of life (QOL).

Study Design: Cross-sectional study of 23 postlingually deafened adults with CIs.

Methods: Participants responded to an open-ended questionnaire regarding rehabilitation strategies. A subset underwent in-depth interviews. Thematic content analysis was applied to the questionnaires and interview transcripts. Participants also underwent word recognition testing and completed a CI-related QOL measure. Participants were classified as having good or poor performance (upper or lower quartile for speech recognition) and high or low QOL (upper or lower quartile for QOL). Rehabilitation themes were compared and contrasted among groups.

Results: Five rehabilitation themes were identified: 1) Preimplant expectations of postoperative performance, 2) personal motivation, 3) social support, 4) specific rehabilitation strategies, and 5) patient-perceived role of the audiologist. Patients with good speech recognition and high QOL tended to pursue more active rehabilitation and had greater social support. Patient expectations and motivation played significant roles in postoperative QOL.

Conclusion: Postoperative patient-driven rehabilitation strategies are highly variable but appear to relate to outcomes. Larger-scale extensions of this pilot study are needed.

Key Words: auditory training, aural rehabilitation, cochlear implants, quality of life, sensorineural hearing loss, speech perception, speech recognition

参考译文：

成人人工耳蜗植入术后康复策略的初步研究

Michael S. Harris, MD; Natalie R. Capretta, BS; Shirley C. Henning, MS, CCC-SLP; Laura Feeney, AuD; Mark A. Pitt, PhD; Aaron C. Moberly, MD

【摘要】

目的/假设：成人人工耳蜗植入术后听力康复尚不规范。由于医保补偿不足以及现有的康复策略疗效尚缺乏数据支持（或反驳），美国大多数人工耳蜗（CI）中心没有常规地让成人CI患者参与针对性的术后康复计划，因此患者通常采取自主驱动的康复方法。这项探索性的初步研究调查了成人CI患者的康复策略，并将这些策略与言语识别和CI相关的生活质量（QOL）进行关联。

研究设计：对23例术后聋成人CI患者进行横向研究。

方法：参与者回答一份关于康复策略的开放式问卷，其中一部分人接受了深入访谈，并针对问卷和访谈记录进行主题内容分析。参与者同时也接受了单词识别测试，并完成了CI相关的生活质量测量。参与者被分为表现良好或较差（言语识别的上四分位数或下四分位数）和生活质量高或低（生活质量的上四分位数或下四分位数），并比较对比各组的康复主题。

结果：共确定了五个康复主题：1) 植入前对术后表现的期望，2) 个人动机，3) 社会支持，4) 具体的康复策略，5) 患者对听力医师角色的认知。言语识别能力好、生活质量高的患者倾向于寻求更积极的康复和拥有更多社会支持。患者期望和动机对术后生活质量有显著影响。

结论：术后患者驱动的康复策略是高度可变的，但似乎与结果有关。这项初步研究需要更大规模的扩展。

【关键词】 听觉训练，听力康复，人工耳蜗，生活质量，感音神经性听力损失，言语感知，言语识别

What To Do When Cochlear Implant Users Plateau in Performance: A Pilot Study of Clinician-Guided Aural Rehabilitation

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Abstract

Hypothesis: For experienced adult cochlear implant (CI) users who have reached a plateau in performance, a clinician-guided aural rehabilitation (CGAR) approach can improve speech recognition and hearing-related quality of life (QOL).

Background: A substantial number of CI users do not reach optimal performance in terms of speech recognition ability and/or personal communication goals. Although self-guided computerized auditory training programs have grown in popularity, compliance and efficacy for these programs are poor. We propose that clinician-guided AR can improve speech recognition and hearing-related QOL in experienced CI users.

Methods: Twelve adult CI users were enrolled in an 8-week CGAR program guided by a speech-language pathologist and audiologist. Nine patients completed the program along with pre-AR and immediate post-AR testing of speech recognition (AzBio sentences in quiet and in multi-talker babble, Consonant-Nucleus-Consonant words), QOL (Nijmegen Cochlear Implant Questionnaire, Hearing Handicap Inventory for Adults/Elderly, and Speech, Spatial and Qualities of Hearing Scale), and neurocognitive functioning (working memory capacity, information-processing speed, inhibitory control, speed of lexical/phonological access, and nonverbal reasoning). Pilot data for these 9 patients are presented.

Results: From pre-CGAR to post-CGAR, group mean improvements in word recognition were found. Improvements were also demonstrated on some composite and subscale measures of QOL. Patients who demonstrated improvements in word recognition were those who performed most poorly at baseline.

Conclusions: Clinician-guided CGAR represents a potentially efficacious approach to improving speech recognition and QOL for experienced CI users. Limitations and considerations in implementing and studying AR approaches are discussed.

Key Words: Auditory training, Aural rehabilitation, Cochlear implants, Cognition, Speech Recognition, Quality of Life

TABLE 2. Group mean hearing-related quality of life scores for nine CI users pre- and post-aural rehabilitation (AR)

	Pre-AR Mean (SD)	Post-AR Mean (SD)	<i>t</i> Value	<i>p</i> Value
Hearing-related quality of life				
Nijmegen Cochlear Implant Questionnaire (total)	165.0 (37.0)	183.9 (45.2)	2.89	0.020
Physical	54.8 (14.8)	58.4 (15.2)	1.53	0.164
Psychological	50.8 (16.6)	60.7 (21.4)	1.56	0.158
Social	59.4 (15.2)	64.7 (9.7)	5.93	0.124
Hearing handicap inventory for adults/elderly (total)	56.9 (23.5)	51.1 (24.7)	1.54	0.163
Emotional	29.1 (13.9)	23.1 (13.5)	3.18	0.013
Social	27.8 (13.8)	28.0 (12.0)	0.06	0.954
Speech, spatial, and qualities of hearing (mean)	3.4 (1.4)	4.4 (2.1)	1.69	0.129
Speech	3.0 (1.4)	4.3 (2.0)	2.1	0.069
Spatial	3.0 (1.5)	3.9 (2.2)	0.98	0.257
Qualities	4.5 (2.4)	5.3 (2.5)	1.69	0.134

Results of paired *t* tests are shown comparing group mean scores between pre- and post-AR sessions.

参考译文：

人工耳蜗植入者表现达到瓶颈时该做什么：临床医生指导听力康复的初步研究

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【摘要】

假设：对于有经验的成人人工耳蜗（CI）患者来说，在临床医生的指导下进行听力康复（AR）可以提高言语识别和听力相关的生活质量（QOL）。

背景：大量CI用户在言语识别能力和/或个人交流目标方面没有达到最佳效果。虽然使用电脑进行自我听觉训练已越来越受欢迎，但依从性和有效性都不好。我们建议由临床医生指导AR可以帮助有经验的CI用户提高言语识别和听力相关的生活质量。

方法：12名成人CI患者在语言病理学家和听力学家的指导下参加为期8周的AR治疗。9名患者完成了该项目，同时完成了AR前和AR后的言语识别测试（安静及多人说话噪声下AzBio短句测试、CNC单音节），QOL（奈梅亨人工耳蜗NCIQ问卷、成人/老年人听力障碍量表(HHIA/E)、言语，空间和听力质量量表(SSQ)），以及神经认知功能测试（工作记忆能力、信息处理速度、抑制控制、词汇/言语识别速度和非语言推理）。此研究报告这9名患者的初步研究数据。

结果：从AR前到AR后，组间平均单词识别率均有提高。一些综合和子量表的生活质量指标也有所改善。单词识别能力有所提高的患者，他们在基线检查时效果较差。

结论：对于有经验的CI用户，临床医生指导AR是提高言语识别和生活质量的一种潜在的有效方法。此研究讨论了实现及研究AR方法时的局限性和注意事项。

【关键词】 听觉训练，听力康复，人工耳蜗，认知，言语识别，生活质量

Optimizing Performance in Adult Cochlear Implant Users through Clinician Directed Auditory Training

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Abstract

Clinician-directed auditory training using the KTH Speech Tracking Procedure can be a powerful approach for maximizing outcomes with adult cochlear implant (CI) users. This article first reviews prior research findings from an 8-week clinician-directed auditory training (AT) program using speech tracking that yielded significant gains in speech tracking rate and sentence recognition scores following training. The second focus of the article is to illustrate the value of intensive face-to-face long-term AT using speech tracking with adult CI users. A detailed case study report is presented that demonstrates major ongoing and progressive gains in tracking rate, sentence recognition, and improvements in self-perceived competence and confidence over the course of intensive long-term training. Given the potential of both short- and long-term clinician-directed auditory training via KTH speech tracking to help CI users reach their optimal performance level, consideration for more widespread clinical use is proposed in the overall rehabilitation of adult CI users.

Key Words: Auditory training, cochlear implants, aural rehabilitation, speech tracking

参考译文：

通过临床医师指导的听觉训练优化成人人工耳蜗植入者的表现

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【摘要】

摘要：使用KTH言语跟踪程序进行临床医生指导的听觉训练是一个强而有力的方法，能够充分地提高成人人工耳蜗（CI）用户的效果。本文首先回顾了一个由临床医生指导为期8周的听觉训练（AT）项目的研究结果，该项目使用言语跟踪技术，在训练后的言语跟踪率和句子识别分数方面取得了显著的进步。文章的第二个重点是说明成人CI用户使用言语跟踪密集的面对面长期听觉训练的价值。一份详细的案例研究报告展示了在长期针对性训练过程中，在跟踪率、句子识别以及自我感知能力和信心的提高方面不断取得的重大进步。鉴于通过KTH言语跟踪以及临床医生指导的短期和长期听觉训练有潜力可以帮助CI使用者达到最佳表现水平，建议在成人CI使用者的整体康复中考虑更广泛的临床应用。

【关键词】 听觉训练，人工耳蜗，听力康复，言语跟踪

Comprehensive auditory rehabilitation in adults receiving cochlear implants: A pilot study

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Abstract

Objective: In the United States, most adults who receive cochlear implants (CIs) do not undergo a comprehensive auditory rehabilitation (CAR) approach, which may result in suboptimal outcomes. The objectives of this pilot study were to demonstrate that a CAR approach incorporating auditory training (AT) by a speech-language pathologist (SLP) is feasible in adults receiving CIs and to explore whether this approach results in improved outcomes.

Methods: Twenty-four postlingually deaf adult CI candidates were serially assigned to one of three groups: (a) a “CAR group” that received standard of care implantation, programming by an audiologist, an additional preoperative counseling session, and eight one-hour AT sessions; (b) a “passive control” standard-of-care group; and (c) an “active control” group that also received the extra preoperative counseling session. Participants were tested preoperatively and 1, 3, and 6 months after CI using measures of word and sentence recognition in quiet and in babble, as well as measures of quality of life (QOL).

Results: The CAR approach was feasible, but this pilot study was underpowered to determine efficacy. Differential time courses of speech recognition improvement were seen for sentence and word recognition. All QOL measurements showed improvement from pre-CI to 1 month post-CI activation. Results revealed issues to consider for a larger-scale study of CAR revolving around participant selection, study measures, and sample size.

Conclusion: The CAR approach is feasible in new CI users. A larger trial is needed to investigate whether CAR leads to better outcomes or faster improvement in this clinical population.

Key Words: auditory training, aural rehabilitation, cochlear implants, quality of life, sensorineural hearing loss, speech perception, speech recognition

参考译文:

成人人工耳蜗植入术后听觉综合康复的初步研究

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【摘要】

目的：在美国，大多数接受人工耳蜗植入术（CIs）的成年人没有接受全面的听觉康复（CAR）治疗，这可能导致不理想的效果。这项初步研究的目的是证明由言语语言病理学家（SLP）使用CAR方法进行听觉训练（AT）在成人植入者中是可行的，并探讨这种方法是否能提高效果。

方法：24名语后聋成年CI患者被分别分为三组：（a）接受标准护理植入、由听力专家调试、额外的术前咨询和8次1小时治疗的“CAR组”；（b）“被动对照”标准护理组；（c）“积极对照”组也接受了额外的术前咨询。参与者在术前和术后1、3、6个月进行测试，测试内容包括安静状态下的单词和句子识别以及生活质量（QOL）。

结果：24名语后聋成年CI患者被分别分为三组：（a）“CAR”组接受标准植入流程、由听力专家调试、额外提供术前咨询和8次1小时治疗；（b）“被动对照”组接受标准流程；（c）“积极对照”组也接受了额外的术前咨询。参与者在术前和术后1、3、6个月进行测试，测试内容包括安静状态下的单词和句子识别以及生活质量（QOL）。

结论：CAR方法是可行的，但这项初步研究对于确定疗效方面的统计能力不足。对于句子和单词识别，言语识别提高的时间过程是不同的。所有的生活质量测量均显示从CI前到CI开机后1个月有所改善。研究结果揭示大规模CAR研究时需要考虑的因素，如：参与者的选择、研究测量方法和样本量的问题。

【关键词】 听觉训练，听力康复，人工耳蜗，生活质量，感音神经性听力损失，言语感知，言语识别

Therapist-Guided Telerehabilitation for Adult Cochlear Implant Users: Developmental and Feasibility Study

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Abstract

Background: Cochlear implants can provide auditory perception to many people with hearing impairment who derive insufficient benefits from hearing aid use. For optimal speech perception with a cochlear implant, postoperative auditory training is necessary to adapt the brain to the new sound transmitted by the implant. Currently, this training is usually conducted via face-to-face sessions in rehabilitation centers. With the aging of society, the prevalence of age-related hearing loss and the number of adults with cochlear implants are expected to increase. Therefore, augmenting face-to-face rehabilitation with alternative forms of auditory training may be highly valuable.

Objective: The purpose of this multidisciplinary study was to evaluate the newly developed internet-based teletherapeutic multimodal system Train2hear, which enables adult cochlear implant users to perform well-structured and therapist-guided hearing rehabilitation sessions on their own.

Methods: The study was conducted in 3 phases: (1) we searched databases from January 2005 to October 2018 for auditory training programs suitable for adult cochlear implant users; (2) we developed a prototype of Train2hear based on speech and language development theories; (3) 18 cochlear implant users (mean age 61, SD 15.4 years) and 10 speech and language therapists (mean age 34, SD 10.9 years) assessed the usability and the feasibility of the prototype. This was achieved via questionnaires, including the System Usability Scale (SUS) and a short version of the intrinsic motivation inventory (KIM) questionnaires.

Results: The key components of the Train2hear training program are an initial analysis according to the International Classification of Functioning, Disability and Health; a range of different hierarchically based exercises; and an automatic and dynamic adaptation of the different tasks according to the cochlear implant user's progress. In addition to motivational mechanisms (such as supportive feedback), the cochlear implant user and therapist receive feedback in the form of comprehensive statistical analysis. In general, cochlear implant users enjoyed their training as assessed by KIM scores (mean 19, SD 2.9, maximum 21). In terms of usability (scale 0-100), the majority of users rated the Train2hear program as excellent (mean 88, SD 10.5). Age ($P=.007$) and sex ($P=.01$) had a significant impact on the SUS score with regard to usability of the program. The therapists (SUS score mean 93, SD 9.2) provided slightly more positive feedback than the cochlear implant users (mean 85, SD 10.3).

Conclusions: Based on this first evaluation, Train2hear was well accepted by both cochlear implant users and therapists. Computer-based auditory training might be a promising cost-effective option that can provide a highly personalized rehabilitation program suited to individual cochlear implant user characteristics.

Key Words: telerehabilitation; cochlear implantation; computer-based auditory training; multimodal platform system

参考译文:

治疗师指导下的成人人工耳蜗用户的远程康复：发展及可行性研究

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【摘要】

背景：人工耳蜗可为许多助听器补偿效果不佳的听力受损患者提供听觉感知。为获得最佳的人工耳蜗言语感知，术后的听觉训练是必要的，使大脑适应由植入体传输的新声音。目前，术后听觉训练通常是在康复中心“面对面”进行。随着社会老龄化，与年龄相关的听力损失患病率和成人人工耳蜗用户的数量预计会增加。因此，通过其他形式的听觉训练来增强“面对面”的康复可能非常有价值。

目的：该项多学科研究的目的是评价新开发的互联网远程治疗多模式系统Train2hear，该系统使成人人工耳蜗用户能够自行进行系统的和治疗师指导下的听力康复训练。

方法：研究分3个阶段进行:(1)检索2005年1月至2018年10月的数据库，寻找适合成人人工耳蜗用户的听觉训练项目;(2)开发基于语音和语言发展理论的Train2hear模型;(3) 18例人工耳蜗用户(平均年龄61岁，SD 15.4岁)和10名语言治疗师(平均年龄34岁，SD 10.9岁)参与评估Train2hear的可用性和可行性，该评估采用问卷调查，包括系统可用性量表(SUS)和简版的内在动机问卷(KIM)。

结果：Train2hear训练项目的关键部分是根据《国际功能、残疾和健康分类》进行初步分析;一系列不同层次的练习;根据人工耳蜗用户的进度自动动态地适应不同的任务。除了动机机制(如支持性反馈)，人工耳蜗用户和治疗师接受综合统计分析形式的反馈。总的来说，人工耳蜗用户投入训练，并根据KIM评分(平均19分，SD 2.9，最大21分)。在可用性方面(0-100分)，大多数用户评价Train2hear为优秀(平均88分，SD 10.5分)。年龄(P=.007)和性别(P=.01)对项目可用性的SUS评分有显著影响。治疗师(SUS评分平均93分，SD 9.2分)提供的积极反馈略高于人工耳蜗用户(平均85分，SD 10.3分)。

结论：Train2hear在首次评估中被人工耳蜗用户和治疗师认可。计算机化听觉训练可能是非常有成本效益的选择，可提供高度个性化的康复项目，以适合不同人工耳蜗用户的特性。

【关键词】 远程康复;人工耳蜗植入;计算机化听觉训练;多模式平台系统

Talker-identification training using simulations of binaurally combined electric and acoustic hearing: Generalization to speech and emotion recognition

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Abstract

Understanding speech in background noise, talker identification, and vocal emotion recognition are challenging for cochlear implant (CI) users due to poor spectral resolution and limited pitch cues with the CI. Recent studies have shown that bimodal CI users, that is, those CI users who wear a hearing aid (HA) in their non-implanted ear, receive benefit for understanding speech both in quiet and in noise. This study compared the efficacy of talker-identification training in two groups of young normal-hearing adults, listening to either acoustic simulations of unilateral CI or bimodal (CI+HA) hearing. Training resulted in improved identification of talkers for both groups with better overall performance for simulated bimodal hearing. Generalization of learning to sentence and emotion recognition also was assessed in both subject groups. Sentence recognition in quiet and in noise improved for both groups, no matter if the talkers had been heard during training or not. Generalization to improvements in emotion recognition for two unfamiliar talkers also was noted for both groups with the simulated bimodal-hearing group showing better overall emotion-recognition performance. Improvements in sentence recognition were retained a month after training in both groups. These results have potential implications for aural rehabilitation of conventional and bimodal CI users.

参考译文:

双耳声电联合听力模拟下的讲话者识别训练: 言语和情绪识别泛化性

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【摘要】

由于人工耳蜗的频谱分辨率较差和音高信号有限, 理解背景噪音中的言语、讲话者识别和言语情绪识别对人工耳蜗(CI)用户很难。最新的研究表明, 双模用户(即在非植入耳佩戴助听器(HA)的CI用户)可在安静和噪音环境中的言语理解获益。该项研究比较了两组听力正常的年轻成年人的说话者识别训练效果, 分别测听单侧CI或双模(CI+HA)听力的声学模拟。训练提高了两组的说话者识别能力, 模拟双模听力的整体表现更好。评估两组受试者的学习句子识别和情绪识别的泛化性。两组受试者在安静和噪音环境下的句子识别能力都有所提高, 无论说话者的声音在训练中是否听过。两组受试者对两个陌生的讲话者情绪识别的改善泛化性也很显著, 模拟双模听力组表现出更好的整体情绪识别。训练一个月后, 两组的句子识别能力都得到了改善。这些结果对传统和双模CI用户的听力康复有潜在意义。

听觉康复训练对成人语后聋CI患者的效果分析

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【摘要】

目的：探讨听觉康复训练对成人语后聋人工耳蜗植入(CI)患者的干预效果。

方法：选择2017年1月~2020年1月本院CI术后的80例语后聋成人患者纳入研究。随机分为实验组和对照组(各40例)，实验组进行为期6个月的听觉康复训练，包括简单分类训练、理解综合训练和实际应用训练，对照组不进行干预。分析干预前后两组患者言语识别能力及交流能力问卷 (communication performance assessment, CPA) 得分情况。

结果：实验组的言语识别能力评分明显提高，且显著高于对照组 ($P < 0.05$)，干预前两组被试CPA总分及交流能力、人际交往、社会交往职业等各分项评分差异较小，不具有统计学意义 ($P > 0.05$)。干预后实验组CPA总分及各分项评分明显提高，且显著高于对照组 ($P < 0.05$)。

结论：听觉康复训练能够提高语后聋成人人工耳蜗植入患者的言语识别能力，改善患者交流能力和听力康复效果。

【关键词】 语后聋;成人;听觉康复训练;人工耳蜗植入

表3 两组干预前后交流能力评估比较($\bar{x} \pm s$,分)

项目	对照组		实验组	
	干预前	干预后	干预前	干预后
对交流能力的影响	22.04 ± 6.16	24.05 ± 7.62	22.46 ± 6.74	32.84 ± 10.05*#
人际交往的影响	9.10 ± 1.63	10.26 ± 1.76	9.03 ± 1.54	13.27 ± 2.41*#
对社会交往的影响	29.14 ± 7.05	31.25 ± 8.07	29.07 ± 6.91	41.08 ± 15.62*#
对职业的影响	12.04 ± 3.05	13.25 ± 3.52	12.48 ± 3.12	17.51 ± 5.01*#
CPA总分	72.26 ± 17.51	78.71 ± 19.04	73.15 ± 18.31	98.51 ± 32.91*#

*与干预前相比, $P < 0.05$; #与对照组相比, $P < 0.05$

参考译文:

Auditory Rehabilitation Training for Postlingually Deafened Adult Patients after Cochlear Implantation

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Abstract

Objective: To investigate the effect of hearing rehabilitation training for post—speech deaf adult with cochlear implant.

Methods: Eighty postlingually deafened adults who underwent cochlear implantation in our hospital from January 2017 to January 2020 were selected for study.They were randomly divided into the intervention group and control group (40 cases each).The intervention group used systematic hearing rehabilitation training for intervention that lasted for 6 months, including simple classification training, comprehension training and practical training, and no intervention was provided in the control group. Speech recognition scores and communication performance assessment (CPA) scores before and after intervention were collected and analyzed.

Result: The speech recognition scores of the intervention group were significantly improved and were higher than those of the control group ($p<0.05$). Before the intervention, the differences in speech recognition scores between the two groups were small and not significant ($p>0.05$). Six months after the intervention, the CPA total score and sub-scores of communication ability,interpersonal communication,social interaction had smaller differences between two groups, which was not statistically significant ($p>0.05$). CPA total score and scores of each subgroup significantly increased in the intervention group and were significantly higher than those in the control group ($p<0.05$).

Conclusion: Auditory rehabilitation training can significantly improve the speech recognition scores of postlingually deafened adult patients and improve the patients' communication ability and auditory performance.

Key words: Postlingual deafness; Adult; Auditory rehabilitation training;Cochlear implantation

语后聋人工耳蜗植入的成人患者听觉言语康复训练及效果评价

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【摘要】

目的：探讨语后聋人工耳蜗植入的成人患者听觉言语康复训练方法,促进患者术后尽快康复。

方法：在患者术后即进行听觉言语康复训练,并在人工耳蜗植入前及开机后各时间段(1,2,4,6,10个月)进行各项听觉识别能力评估。

结果：6例成人语后聋患者经过10个月的听觉言语康复训练,言语识别率显著提高。

结论：按照聆听技能发展的4个阶段循序渐进开展康复训练的方法使患者能较快适应耳蜗的声音,但应根据患者情况调整训练方法,设立个性化训练目标,增加训练趣味性,同时充分发挥家庭支持作用。

【关键词】 语后聋;人工耳蜗植入;听觉言语康复训练;效果评价

表 1 成人语后聋人工耳蜗植入者听觉言语评估正确率(% , $\bar{x} \pm s$)

评估时间	声母识别	韵母识别	音节听辨	简单句听辨	听觉记忆
术前	0	0	0	0	0
开机 1 个月	31.80 ± 19.59	47.17 ± 16.42	53.33 ± 14.39	43.33 ± 16.84	36.50 ± 19.21
开机 2 个月	48.60 ± 17.82	61.33 ± 14.92	69.00 ± 11.56	63.00 ± 13.07	60.83 ± 16.41
开机 4 个月	67.10 ± 17.49	75.00 ± 16.06	77.67 ± 13.98	75.33 ± 15.65	74.83 ± 18.44
开机 6 个月	75.30 ± 14.51	80.67 ± 14.56	79.17 ± 11.79	81.17 ± 10.96	78.50 ± 12.23
开机 10 个月	82.30 ± 14.17	87.33 ± 10.65	88.67 ± 10.13	88.17 ± 10.55	87.50 ± 11.33

参考译文:

The effect evaluation of auditory speech rehabilitation training in postlingually deafened adults with Cochlear Implants

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Abstract

Objective: To investigate the methods of auditory speech rehabilitation training in postlingually deafened adults after cochlear implantation in order to promote the recovery as soon as possible.

Methods: The patients took training on auditory speech rehabilitation after surgery, the auditory recognition was evaluated before surgery and at the period of 1,2,4,6, and 10 months after implantation.

Results: The speech recognition in 6 postlingually deafened adults was significantly improved after 10 months of auditory speech rehabilitation training.

Conclusion: The methods of rehabilitation training according to the four stages of the development of listening skills enable patients adapt to the CI sound as soon as possible. However, the training methods should be individualized, setting personalized training objectives, increasing training interest, and enhancing family support.

Key words: postlingual deafness; Cochlear implantation; Auditory speech rehabilitation training; effect evaluation

(二) 康复工具及效果—言语

Application of Ambulatory Phonation Monitoring (APM) in the measurement of daily speaking-time and voice intensity before and after cochlear implant in deaf adult patients

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Abstract

Objective: To evaluate the changes in daily voice production, analysed through the Ambulatory Phonation Monitoring (APM), and their relationship with Quality of Life (QOL) measurements in a group of profound deaf patients treated with Cochlear Implant (CI).

Methods: A total of 12 consecutive post-lingual deaf patients (8 females and 4 males) treated with CI for bilateral severe-to-profound hearing loss were enrolled. Each patient was evaluated before and after 6 months of CI use. In particular, the daily voice production evaluation was performed using the APM, while QOL information were gathered from the Italian version of the Nijmegen Cochlear Implant Questionnaire (I-NCIQ).

Results: Significant differences in the APM results obtained before and after CI were found. In particular, a significant decrease of the mean amplitude and a significant increase of the daily phonation time and percentage of phonation time were demonstrated after CI use in all the patients. A significant improvement in the I-NCIQ scores was demonstrated after CI use and significant correlations among I-NCIQ scores and the APM parameters were found.

Conclusions: The APM could be useful in the evaluation of the benefits of cochlear implantation and may represent an indicator of deaf patient participation. In addition, the daily voice production's modifications after CI and their significant relations with the changes in QOL measurements could be useful in treatment planning as well as during pre- and post-operative counselling.

Key Words: Cochlear implant; Voice; QOL; APM

参考译文:

动态言语监测在聋人耳蜗植入前后日常说话时间和言语强度测量的应用

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【摘要】

目的：通过动态发声监测（APM）分析人工耳蜗植入术后重度聋患者日常发声的变化及其与生活质量（QOL）的关系。

方法：12例语后聋患者（女8例，男4例）接受CI治疗。每位患者在CI使用6个月前后进行评估。特别是日常发声评估是使用APM进行的，而生活质量信息是从意大利版的奈梅亨人工耳蜗问卷（I-NCIQ）中收集的。

结果：术前、后APM结果差异有显著性。尤其是在所有患者中，使用CI后平均振幅显著降低，每日发声时间和发声时间百分比显著增加。使用CI后，I-NCIQ评分显著改善，且I-NCIQ评分与APM参数显著相关。

结论：APM可用于评价人工耳蜗植入术的疗效，并可作为聋人参与的一个指标。此外，CI后每日发声量的变化及其与QOL测量变化的显著关系可能有助于治疗计划以及术前和术后咨询。

【关键词】 人工耳蜗；声音；生活质量；APM

The Influence of Auditory Feedback and Vocal Rehabilitation on Pre-lingual Hearing-Impaired Individuals Post Cochlear Implant

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Abstract

Objective: To verify changes in the perceptual and acoustic vocal parameters in prelingual hearing-impaired adults with cochlear implants after vocal rehabilitation.

Hypothesis: Auditory feedback restoration alone after cochlear implant is not enough for vocal adjustments. A targeted and specific voice therapy intervention is required.

Study Design: Prospective and pre–post repeated measures design.

Methods: Twenty literate adults with severe to profound prelingual bilateral sensorineural hearing loss participated in the study; individuals were implanted late and were fluent users of oral language. Ages ranged from 17 to 48 years. All individuals presented normal results in laryngoscopy, and hearing thresholds with the cochlear implant were over 40 dB HL. Individuals were randomly distributed into two groups: Group 1 (treatment group) and Group 2 (control group), both with ten patients each, five men and five women, matching mean age and hearing deprivation time before the cochlear implantation. Patients from Group 1 underwent a protocol of vocal therapy including 12 individual sessions with the same clinician. Group 2 only underwent vocal recordings. The vocal recordings occurred before and after the participation in the therapy protocol for Group 1 and after the same period, 3 months later, without any intervention, for Group 2. The recording sessions used the Consensus Auditory-Perceptual Evaluation of Voice protocol sentence reading and emission of sustained vowel /a/. Auditory-perceptual evaluation of voices was performed by three judges, and the acoustical analysis used the Praat program.

Results: Statistically significant reductions in the overall vocal degree, vocal instability, and degree of resonance change were observed after vocal rehabilitation in Group 1. Statistically, individuals from Group 1 did not differ in regard to the modification of acoustic parameters. Group 2 did not present significant changes in any of the analyzed parameters.

Conclusions: The cochlear implanted adults submitted to vocal rehabilitation presented changes in the auditory-perceptual parameters, with reduction of the overall voice severity, vocal instability, and degree of resonance after vocal intervention. There were no changes in the acoustic parameters in the implanted prelingual hearing-impaired adult subjects.

Key Words: Voice; Hearing Loss; Cochlear Implantation; Rehabilitation; Adult

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听觉反馈和言语康复对语前聋患者人工耳蜗植入后的影响

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【摘要】

目的：验证成人语前聋人工耳蜗用户言语康复后的感知参数和听觉言语参数的变化。

假设：人工耳蜗植入后仅恢复听觉反馈不足以矫正言语。需要针对性和特定的嗓音治疗干预。

研究设计：前瞻性和术前术后重复测量设计。

方法：20例患有双侧重度极重度听力损失的语前聋患者参与本次研究：均植入耳蜗时间较晚且口语流利，年龄从17岁到48岁，喉镜检查结果均正常，人工耳蜗助听听阈超过40 dB HL。随机分为治疗组和对照组，每组10例，男5例，女5例，匹配平均年龄和人工耳蜗植入前听力剥夺时长。治疗组接受言语治疗方案，包括同一位临床执行的12个单独疗程。对照组仅进行录音，在治疗组参与治疗方案之前和之后及3月后同期执行，对照组没有任何干预。对照组录音部分采用嗓音听感知一致性评估方案、句子阅读和持续元音/a/发音。三位听评委完成嗓音的听感知评估，采用Praat进行声学分析。

结果：治疗组言语康复后，可观察到整体言语程度，言语不稳定性和共振变化程度在统计学上显著降低，声学参数修正无统计学变化。对照组在所有分析参数中均未出现显著变化。

结论：成人人工耳蜗用户言语康复后，听感知参数发生变化，言语干预后整体嗓音严重程度、发声不稳定性、共振程度均降低。语前聋耳蜗用户的听觉参数无变化。

【关键词】 嗓音;听力损失;人工耳蜗植入;康复;成人

The Effects of Behavioral Speech Therapy on Speech Sound Production With Adults Who Have Cochlear Implants

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Abstract

Purpose: In this study, the authors examined the treatment efficacy of a behavioral speech therapy protocol for adult cochlear implant recipients.

Method: The authors used a multiple-baseline, across behaviors and -participants design to examine the effectiveness of a therapy program based on behavioral principles and methods to improve the production of target speech sounds in 3 adults with cochlear implants. The authors included probe items in a baseline protocol to assess generalization of target speech sounds to untrained exemplars. Pretest and posttest scores from the Arizona Articulation Proficiency Scale, Third Revision (Arizona-3; Fudala, 2000) and measurement of speech errors during spontaneous speech were compared, providing additional measures of target behavior generalization.

Results: The results of this study provided preliminary evidence supporting the overall effectiveness and efficiency of a behavioral speech therapy program in increasing percent correct speech sound production in adult cochlear implant recipients. The generalization of newly trained speech skills to untrained words and to spontaneous speech was demonstrated.

Conclusion: These preliminary findings support the application of behavioral speech therapy techniques for training speech sound production in adults with cochlear implants. Implications for future research and the development of aural rehabilitation programs for adult cochlear implant recipients are discussed.

Key Words: adults, aural rehabilitation, speech production, speech-language pathology, cochlear implants

Table 3. Number of opportunities to produce target speech sounds and the percent correct production of target speech sounds in the spontaneous conversational speech samples during the prescreening (pretest) and posttest.

Participant	Number of opportunities to produce target speech sounds		Percent correct production of target speech sounds	
	Prescreening	Posttest	Prescreening	Posttest
Participant A				
/s/	94	124	24.46	76.6
/tʃ/	13	11	0.08	72.7
/r/	18	28	11.1	50.0
Participant B				
/tʃ/	4	6	0.00	83.3
/s/	67	69	17.9	52.2
/r/	30	16	40.0	53.3
Participant C				
/rj/	13	14	23.0	35.7
/dʒ/	8	5	0.00	60.0
/z/	43	34	27.9	47.0

参考译文：

行为言语疗法对成人人工耳蜗植入者言语发音的影响

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【摘要】

目的：作者在本研究中检测了一项行为言语治疗方案对成人人工耳蜗植入者的治疗效果。

方法：使用多基线、跨行为和参与者设计的方法，检测基于行为原则和方法的治疗方案的有效性，以改善3例成人人工耳蜗植入者的目标言语发音。作者将基线方案纳入检测项目，以评估对未经训练的样例的目标言语发音的泛化性。比较治疗前和治疗后亚利桑那州发音能力量表（第三版）（亚利桑那州3；Fudala, 2020）的得分以及检测即时言语中的发音错误，提供额外的目标行为泛化测量。

结果：该项研究结果提供了初步证据，这些证据支持行为言语疗法在提高成人人工耳蜗植入者言语发音百分比方面的整体有效性和效率。研究表明了新训练的言语技能可广泛应用到未训练的单词和即时言语。

结论：初步研究结果支持行为言语治疗技术应用到成人人工耳蜗植入者的言语发音训练。本文讨论了成人人工耳蜗植入者听力康复项目的未来研究和发展的意义。

【关键词】 成人，听觉康复，言语产生，言语病理，人工耳蜗

(三) 音乐相关

A Music-Related Quality of Life Measure to Guide Music Rehabilitation for Adult Cochlear Implant Users

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Abstract

Purpose: A music-related quality of life (MuRQoL) questionnaire was developed for the evaluation of music rehabilitation for adult cochlear implant (CI) users. The present studies were aimed at refinement and validation.

Method: Twenty-four experts reviewed the MuRQoL items for face validity. A refined version was completed by 147 adult CI users, and psychometric techniques were used for item selection, assessment of reliability, and definition of the factor structure. The same participants completed the Short Form Health Survey for construct validation. MuRQoL responses from 68 CI users were compared with those of a matched group of adults with normal hearing.

Results: Eighteen items measuring music perception and engagement and 18 items measuring their importance were selected; they grouped together into 2 domains. The final questionnaire has high internal consistency and repeatability. Significant differences between CI users and adults with normal hearing and a correlation between music engagement and quality of life support construct validity. Scores of music perception and engagement and importance for the 18 items can be combined to assess the impact of music on the quality of life.

Conclusion: The MuRQoL questionnaire is a reliable and valid measure of self-reported music perception, engagement, and their importance for adult CI users with potential to guide music aural rehabilitation.

Key Words: cochlear implant, quality of life, impact, questionnaire, validity, reliability

参考译文：

与音乐相关的生活质量衡量指标来指导成人人工耳蜗用户的音乐康复

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【摘要】

目的：开发了音乐相关生活质量（MuRQoL）问卷，用于评估成人人工耳蜗（CI）用户的音乐康复情况。本研究旨在完善和验证。

方法：24位专家对MuRQoL项目的表面效度进行了审查。147位成人CI用户参与了版本改进，并使用心理测量技术进行项目选择，可靠性评估和要素结构定义。相同的参与者完成了“健康状况调查简表”以进行效度检验。将68名CI用户的MuRQoL的结果与匹配的听力正常的成年人组进行比较。

结果：挑选了18个衡量音乐感知度和参与度的项目和18个衡量其重要性的项目；它们分为两个区域。最终问卷具有很高的内部一致性和可重复性。CI用户和听力正常的成年人之间存在显著差异，音乐参与度和生活质量之间的相关性也有助于建构效度。音乐感知和参与度以及18个项目的重要性得分可以组合起来，以评估音乐对生活质量的影响。

结论：MuRQoL问卷是一项用于自我报告音乐感知、参与度的可靠且有效的度量，并且问卷项目的重要性有潜力指导成人人工耳蜗（CI）用户音乐听觉康复。

【关键词】人工耳蜗；生活质量；影响；问卷；有效性；可靠性

Aural Rehabilitation through Music Workshops for Cochlear Implant Users

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Abstract

Background: It has been reported that after speech perception, music appreciation is the second most commonly expressed requirement among cochlear implant (CI) recipients. Certain features of music are known to be more readily accessible; however, provision of music rehabilitation for adult CI users is limited.

Purpose: A series of music workshops were organized to (1) enable attendees to explore which aspects of music they are able to perceive and appreciate; (2) raise awareness of listening strategies, technology, and rehabilitation resources for music; and (3) develop ideas, and prototype software, for inclusion in a music rehabilitation program. The therapeutic value of music workshops was concurrently investigated.

Research Design: A qualitative, longitudinal study was used. Two consultation meetings were held before a series of nine music workshops that occurred over a period of 5 mo.

Study Sample: Five adult CI users participated in consultations before the workshops. Twenty-eight adult CI users from the South of England Cochlear Implant Centre attended at least one of the workshops.

Intervention: Participants could attend as many workshops as they wished. Each workshop lasted between 2 to 2.5 hr and included individual computer-based and group activities.

Data Collection and Analysis: Responses to open-ended questions were transcribed in the consultation meetings and used to develop workshop activities. A preworkshop survey was used to determine attendees' aspirations and expectations. Postworkshop surveys were used to qualitatively and quantitatively evaluate attendees' immediate reactions to the workshop content, software, and perceived benefits. A 2-month, postworkshop survey evaluated the longer-term impact of the workshops.

Results: Overall reaction to the workshops and prototype software was positive. All attendees indicated that they anticipated changing how they engaged with music as a result of the workshops, and data from the preworkshop and postworkshop surveys suggest a positive change in listening habits.

Conclusions: The workshops proved to be an effective means of simultaneously encouraging music exploration in a social and safe environment and obtaining feedback on prototype rehabilitation materials. Survey data suggested that through group listening and practical activities, certain aspects of music can be accessible and rewarding through a CI, leading to positive changes in attitude and behavior toward music.

Key Words: Cochlear implants, music, therapy, training, rehabilitation, workshops, evaluation
Abbreviations: CI = Cochlear implant; MCI = melodic contour identification; SOECIC = South of England Cochlear Implant Centre

参考译文：

通过音乐研讨会对人工耳蜗用户进行听觉康复

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【摘要】

背景：据报道，音乐欣赏是人工耳蜗（CI）用户最普遍表达的需求之一，仅次于言语识别。已知音乐的某些特征更易于感知；然而，缺少针对成年CI用户的音乐康复服务。

目的：举办了一系列音乐研讨会，目的是：（1）让参与者探索他们能够感知和欣赏音乐的哪些方面；（2）提高对音乐的聆听策略，技巧和康复资源的认识；（3）开拓用于音乐康复计划的思路和原型软件。同时，研究音乐研讨会的治疗价值。

研究设计：使用定性，纵向研究。在5个月内举行一系列9场音乐研讨会，并在此之前开展了2次咨询会议。

研究样本：5位成人CI用户在音乐研讨会之前参与了咨询会议。来自英国南部人工耳蜗植入中心的28位成人CI用户参加了至少一场音乐研讨会。

干涉措施：参与者可以根据需要尽可能多的参加音乐研讨会。每场研讨会持续时间在2-2.5小时之间，其中包括借助计算机的个人活动和小组活动。

数据收集和分析：在咨询会议上对开放问题的答复被记录并用于开展研讨会活动。研讨会前的调查用于确定与会者的愿望和期望。研讨会后的调查用于定性和定量评估与会者对研讨会内容，软件和效益认知的即时反应。为期2个月的研讨会后调查用于评估研讨会的长期影响。

结果：对研讨会和原型软件的总体反映是积极的。所有与会者均表示研讨会将改变他们音乐互动的方式，而来自研讨会前后的调查数据表明，他们的聆听习惯有了积极性的变化。

结论：实践证明，这些研讨会可以在社会和安全的环境中鼓励音乐探索并且是获得康复原型材料反馈的有效手段。调查数据表明，通过小组聆听和实践活动，音乐的某些方面可以通过CI感知并得到回报，从而导致人们对音乐的态度和行为产生积极的变化。

【关键词】 人工耳蜗；音乐；治疗；训练；康复；研讨会；评估

Participatory design of a music aural rehabilitation programme

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Abstract

Objectives: Many cochlear implant (CI) users wish to enjoy music but are dissatisfied by its quality as perceived through their implant. Although there is evidence to suggest that training can improve CI users' perception and appraisal of music, availability of interactive music-based aural rehabilitation for adults is limited. In response to this need, an 'Interactive Music Awareness Programme' (IMAP) was developed with and for adult CI users.

Methods: An iterative design and evaluation approach was used. The process began with identification of user needs through consultations, followed by use of mock-up applications in workshops. Feedback from these were used to develop the prototype IMAP; a programme of 24 interactive sessions, enabling users to create and manipulate music. The prototype IMAP was subsequently evaluated in a home trial with 16 adult CI users over a period of 12 weeks.

Results: Overall ratings for the prototype IMAP were positive and indicated that it met users' needs. Quantitative and qualitative feedback on the sessions and software in the prototype IMAP were used to identify aspects of the programme that worked well and aspects that required improvement. The IMAP was further developed in response to users' feedback and is freely available online.

Conclusions: The participatory design approach used in developing the IMAP was fundamental in ensuring its relevance, and regular feedback from end users in each phase of development proved valuable for early identification of issues. Observations and feedback from end users supported a holistic approach to music aural rehabilitation.

Key Words: Participatory design, Music aural rehabilitation, Cochlear implant, Interactive learning, Computer-based training

参考译文：

音乐听觉康复课程的参与式设计

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【摘要】

目的：许多人工耳蜗（CI）用户希望欣赏音乐，但对通过植入体感受到的音乐质量不满意。尽管有证据表明语训可以改善CI用户对音乐的感知和评价，但基于音乐互动的成人听觉康复服务的可用性有限。为满足这种需求，开发了针对成人CI用户的“音乐互动认知课程”（IMAP）。

方法：使用了迭代设计和评估方法。该流程为先通过协商确定用户需求，然后在研讨会中使用样机应用程序。他们的反馈意见被用于开发IMAP原型；一个包含24个互动会话的程序，使用户能够创建和操纵音乐。在12周的时间内对16位成人CI用户进行了家庭试验，以对IMAP原型进行随访评估。

结果：IMAP原型的总体评分为积极的，表明它满足了用户的需求。IMAP原型中的会话和软件的定量和定性反馈用于确定程序的各个方面是否有效以及需要改进的方面。IMAP是为响应用户的反馈而进一步开发的，可在线免费获得。

结论：开发IMAP所使用的参与式设计方法是确保其相关性的基础，并且最终用户在开发的每个阶段的定期反馈对于早期发现问题非常有价值。最终用户的观察和反馈支持了音乐听觉康复的整体方法。

【关键词】 参与式调试；音乐听觉康复；人工耳蜗；交互式学习；基于计算机的训练

(四) 其他—认知能力

Improvement of Cognitive Function After Cochlear Implantation in Elderly Patients

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Abstract

Importance: The association between hearing impairment and cognitive decline has been established; however, the effect of cochlear implantation on cognition in profoundly deaf elderly patients is not known.

Objective: To analyze the relationship between cognitive function and hearing restoration with a cochlear implant in elderly patients.

Design, Setting, and Participants: Prospective longitudinal study performed in 10 tertiary referral centers between September 1, 2006, and June 30, 2009. The participants included 94 patients aged 65 to 85 years with profound, post-lingual hearing loss who were evaluated before, 6 months after, and 12 months after cochlear implantation.

Interventions: Cochlear implantation and aural rehabilitation program.

Main Outcomes and Measures: Speech perception was measured using disyllabic word recognition tests in quiet and in noise settings. Cognitive function was assessed using a battery of 6 tests evaluating attention, memory, orientation, executive function, mental flexibility, and fluency (Mini-Mental State Examination, 5-word test, clock-drawing test, verbal fluency test, d2 test of attention, and Trail Making test parts A and B). Quality of life and depression were evaluated using the Nijmegen Cochlear Implant Questionnaire and the Geriatric Depression Scale-4.

Results: Cochlear implantation led to improvements in speech perception in quiet and in noise (at 6 months: in quiet, 42% score increase [95% CI, 35%-49%; $P < .001$]; in noise, at signal to noise ratio [SNR] +15 dB, 44% [95% CI, 36%-52%, $P < .001$], at SNR +10 dB, 37% [95% CI 30%-44%; $P < .001$], and at SNR +5 dB, 27% [95% CI, 20%-33%; $P < .001$]), quality of life, and Geriatric Depression Scale-4 scores (76% of patients gave responses indicating no depression at 12 months after implantation vs 59% before implantation; $P = .02$). Before cochlear implantation, 44% of the patients (40 of 91) had abnormal scores on 2 or 3 of 6 cognition tests. One year after implant, 81% of the subgroup (30 of 37) showed improved global cognitive function (no or 1 abnormal test score). Improved mean scores in all cognitive domains were observed as early as 6 months after cochlear implantation. Cognitive performance remained stable in the remaining 19% of the participants (7 of 37). Among patients with the best cognitive performance before implantation (ie, no or 1 abnormal cognitive test score), 24% (12 of 50) displayed a slight decline in cognitive performance. Multivariate analysis to examine the association between cognitive abilities before implantation and the variability in cochlear implant outcomes demonstrated a significant effect only between long-term memory and speech perception in noise at 12 months (SNR +15 dB, $P = .01$; SNR +10 dB, $P < .001$; and SNR +5 dB, $P = .02$).

Conclusions and Relevance: Rehabilitation of hearing communication through cochlear implantation in elderly patients results in improvements in speech perception and cognitive abilities and positively influences their social activity and quality of life. Further research is needed to assess the long-term effect of cochlear implantation on cognitive decline.

Key Words : Speech Perception; Quality of Life; Prospective Studies; Aged; 80 and over; Cochlear Implantation; Cochlear Implants; Cognition Disorders; Male; Neuropsychological Tests; Longitudinal Studies; Humans; Hearing Tests; Geriatric Assessment; Female; Depression

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老年患者人工耳蜗植入术后认知功能的改善

Isabelle Mosnier, MD; Jean-Pierre Bebear, MD; Mathieu Marx, MD, PhD; Bernard Fraysse, MD; Eric Truy, MD; Geneviève Lina-Granade, MD; Michel Mondain, MD, PhD; Françoise Sterkers-Artières, MD; Philippe Bordure, MD; Alain Robier, MD; Benoit Godey, MD, PhD; Bernard Meyer, MD; Bruno Frachet, MD; Christine Poncet-Wallet, MD; Didier Bouccara, MD; Olivier Sterkers, MD, PhD

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【摘要】

重要性: 听力损失和认知能力下降之间的联系已经确立;然而, 植入人工耳蜗对重度聋的老年患者认知能力的影响尚不清楚。

目的: 为了分析老年人工耳蜗植入者认知功能与听力恢复的关系。

设计、设置和受试者: 2006年9月1日至2009年6月30日, 在10个三级转诊中心进行了前瞻性纵向研究。研究对象包括94例65 - 85岁的重度语后聋患者, 他们分别在人工耳蜗植入术前、6个月后和12个月后进行评估。

干预措施: 植入人工耳蜗和听觉康复计划。

主要成果和措施: 在安静和噪声环境下使用双音节词识别测试来评估言语感知能力。认知功能的评估采用了6种测试, 包括注意力、记忆、定向、执行功能、心理灵活性和流畅性(小型心理状态测试、5字测试、时钟绘图测试、语言流畅性测试、注意力d2测试和Trail Making测试A和B部分)。采用 Nijmegen人工耳蜗问卷和老年抑郁量表-4评估患者的生活质量和抑郁程度。

结果: 植入人工耳蜗后, 患者在安静和噪音环境下的言语感知能力得到改善(6个月时, 在安静环境下, 评分提高42% [95% CI, 35%-49%; $P < 0.001$];在噪声中, 在信噪比[SNR] +15 dB时, 44% [95% CI, 36%-52%, $P < 0.001$], 在信噪比+10 dB时, 37% [95% CI 30%-44%; $P < 0.001$], 在信噪比+5 dB时, 为27% [95% CI, 20%-33%;($P < 0.001$)]。生活质量和老年抑郁量表-4评分(76%的患者在植入后12个月反应结果表明没有抑郁, 而植入前59%; $P = 0.02$ 点)。在人工耳蜗植入前, 44%的患者(40/91)在6项认知测试中有2或3项得分异常。在植入后一年, 81%的亚组患者(30/37)显示整体认知功能改善(没有或有1个测试分数异常)。早在人工耳蜗植入术后6个月, 所有认知领域的平均分均有改善。剩下19%的参与者(7/37)的认知表现保持稳定。植入前认知表现最好的患者(即无或1项认知测试得分异常)中, 24%(12 / 50)认知表现轻微下降。多变量分析研究认知能力在人工耳蜗植入前后结果的差异, 结果表明仅在植入12个月后的噪声环境中, 长期记忆和言语感知之间存在显著影响(SNR +15 dB, $P = 0.01$;信噪比+10 dB, $P < 0.001$;信噪比+5 dB, $P = 0.02$)。

结论和意义: 老年患者植入人工耳蜗进行听力交流康复, 可改善其言语感知能力和认知能力, 并对其社会活动和生活质量产生积极影响。需要进一步的研究来评估植入人工耳蜗对认知功能下降的长期效果。

【关键词】 言语感知; 生活质量; 前瞻性研究; 年龄; 80及以上; 人工耳蜗植入术; 人工耳蜗; 认知障碍; 男性; 神经心理学测试; 纵向研究; 人类; 听力测试; 老年评估; 女性; 抑郁症

其他—生活质量

Quality of life and speech perception in two late deafened adults with cochlear implants

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Abstract

The aim was to demonstrate the need for a quality of life assessment in biopsychosocial aural rehabilitation (AR) practices with late deafened adults (LDAs) with cochlear implants (CIs). We present a case report of a medical records review of two LDAs enrolled in a biopsychosocial group AR program. A speech perception test Contrasts for Auditory and Speech Training (CAST) and a quality of life (QoL) assessment the Nijmegen Cochlear Implant Questionnaire (NCIQ) were given prior to AR therapy. CAST scores indicated both patients had excellent basic speech perception. However, NCIQ results revealed patients' difficulties in basic and advanced listening settings. NCIQ highlighted patients' self-perceived poor self-esteem and ongoing challenges to their QoL. Speech perception testing results alone are not enough to document the daily challenges of QoL needs of LDAs with CIs. The inclusion of a QoL measure such as the NCIQ is vital in evaluating outcomes of cochlear implantation in LDAs.

Key Words: Cochlear implants; biopsychosocial; late-deafened adults; quality of life.

参考译文:

两名语后聋成人植入人工耳蜗后的生活质量和言语感知

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【摘要】

目的是为了证明语后聋成人(LDAs)人工耳蜗 (CIs) 用户在生物心理社会听觉康复(AR)实践中进行生活质量评估的必要性。我们提供了一份病例报告，回顾两名参加过生物心理社会小组听觉康复项目的语后聋成人的医疗记录。在听觉康复之前，先进行了言语感知测试与听觉和言语训练 (CAST) 的对比并填写了Nijmegen人工耳蜗调查表 (NCIQ) 评估生活质量 (QoL) 。CAST评分表明两名患者均具有出色的基本言语感知能力。然而，NCIQ的结果显示患者在基础和高级听声环境下存在困难。NCIQ突出了患者自我感知的低自尊和对其生活质量的持续挑战。单独的言语感知测试结果不足以记录成人语后聋人工耳蜗用户生活质量需求上的日常挑战。在成人语后聋中纳入NCIQ等生活质量指标对于评价人工耳蜗植入后的效果至关重要。

【关键词】 人工耳蜗；生物心理社会；成人语后聋；生活质量

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