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Rehabilitation of the Hearing Impaired Is a Big Concern

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Abstract

Rehabilitation of the hearing impaired is primarily a big concern to the otolaryngologist because it means to bring back to the normal life of a person who literally is in a world of silence and this can be by various means Hearing Aids for handicaps up to severe loss Personal aids , conventional aids , Hearing aid systems like Group Hearing aids, Lip reading, nonverbal communication for profound loss , sign language vocational guidance , job aptitude guidance, surgical options : Cochlear implants for profound to total deafness. Rehabilitation factors include time of detection of the impairment onset of H.A (Hearing Aid) use type of H.A, duration of therapy and other associated disabilities. Motivation for communication and personnel care, collaborate and build constructive relationships with patient's families vitally essential. In fact, in the rehabilitation it is important to counsel not only the individual with hearing impaired but also their families, care givers, and other service providers related to the disability.

Keywords: Rehabilitation; Hearing impairment; Hearing aids system; Cochlear implants; Noise pollution

Introduction

Clinical examination and audiometric assessment to evaluate the type and degree of hearing loss is the foremost step of any hearing impairment. Hearing aids significantly amplify sound thus improving the ability to hear and understand the spoken words. The benefit patent derives from amplification depends on the severity and type (sensorineural or conductive) of the hearing loss, and the ability to understand speech. Hearing aid is actually a miniature public address system. The first system ever used in the annals of history was the hand cupped behind the ear, from such primitive gesture to the latest advancement of surgically implantable hearing aids with excellent fidelity.

Miniature invisible hearing aids placed near the eardrum and the cochlear implant, all this was possible because of sophisticated diagnostic tests, early diagnosis, medical and surgical treatment microsurgery, and laser systems, and a variety of rehabilitation techniques that has opened new doors for the hearing-impaired person thus helping break the soundless barriers that once restricted and isolated people with hearing loss. An explosion of technologic advancements has yet to come but the driving force behind all this is the dire wish in the days past that deaf could hear. It seems our dreams our wishful thinking is coming true due to our tireless research and innovative technology but correct knowledge about hearing is essential for adopting healthy behavior [1].

It is important to tell that peoples' hearing could remain healthy by avoiding excessive noise that damages the cochlea [2]. Rapid industrialization and unsafe hearing practices threaten the health of the younger generation [3]. Exposure to excessive noise is a major avoidable cause of permanent hearing impairment worldwide [4]. And it is known now that Noise pollution is associated with early presbycusis [5]. Therefore, the community should be informed regarding the hazards of noise pollution. The exposure to cellphones and loud music on radio/TV are known risk factors for hearing impairment [6].

Assistive Listening Devices

An assortment of assistive listening devices are available to help the hearing impaired person. The direct amplification devices consist of earphones connected to an amplifier and a detachable microphone placed near the sound source. Assistive Listening Devices are also available like mobile telephones with a volume control that amplifies sounds These assistive listening devices are useful in automobiles, social gatherings in halls, movies, as well as in homes for watching television by blue tooth the listener wears

earphones with a volume control, in classrooms and lecture halls also FM systems transmit sound to a combination FM receiver and hearing aid, amplifying the sound to the hearing-impaired person with clarity. The Tele communication device allows deaf persons to communicate. Speech reading commonly called lip reading, is an important aspect of hearing rehabilitation. Visual cues associated with speech-gestures; facial expressions-help clarify the spoken message. The functioning of hearing aids is to amplify sounds to a degree and in a manner that will enable a person with hearing impairment to use his or her remaining hearing in an effective manner.

Hearing Aid Instrument

A hearing instrument consists of microphone that transduces acoustic signals into electrical signals. Amplifier amplifies the electrical signal, receiver converts the electrical signal back into an acoustic signal Hearing aids are worn in the ear canal, within the ear, or behind the ear. For mild to moderate hearing loss small hearing aids fit into the ear canal and are more cosmetically acceptable, for more severe hearing loss, larger hearing aids are placed in or behind the ear Programmable hearing aids are controlled with a remote control device that allows patients to alter volume and frequency.

Microphone

For an ideal microphone, the waveform of the electrical signal coming out of the microphones should be similar to the waveform of the acoustical signal going into the microphone. The sensitivity of the microphone will depend upon ratio between the size of the output voltage and the size of the input sound pressure.

Amplifier

The function of an amplifier is to convert a small electrical signal into a larger one. The amplifier can do three things. They can make the voltage larger, but not affect the current. They make the current larger without affecting the voltage.

Battery

They supply power to the hearing instrument. The battery provides the increased signal. The employing factor of a battery is its capacity, the maximum current it can supply, its volume, its electrical impedance and lastly its physical size.

Types of Hearing aids Personal Hearing aids and Hearing aid systems

a) Analogue aids Body worn (BW) – powerful, cheap; Behind the ear (BTE) – costly, less powerful in the ear (ITE), in the canal (ITC) –costlier Cosmetic type (Spectacle type) Air conduction type – usual; Bone conduction type – for atresia / CSOM

b) Digital aids – programmable functions, digital (CD) sound quality

Who Needs a Hearing Aid

When deafness becomes a handicap and the overall loss is greater than 30 – 35 dB which is the speech range in the better ear by audiometry, upto severe loss. The CROS, BICROS, and transcranial hearing aids are used by patients with profound sensorineural hearing loss in one ear. The CROS and BICROS aids radio waves to a hearing aid worn in the ear with better hearing. The transcranial hearing aid Battery supplies power to the hearing instrument transmits sound from the deaf car through the skull to the normal ear. A speech therapist works in collaboration with audiologists to assist children in developing and using their residual hearing as well as to improve their communication skills including articulation (speech sound) development, and language skills. The aim of auditory training is to enhance the residual hearing of the impaired to the extent possible. With the increased use of hearing aids and cochlear implants, auditory training has become an integral part of the rehabilitation process with hearing impaired children.

In children with cochlear implants, speech therapy program focuses on improving their ability to interpret the auditory information that they are receiving through the implant. Those children must learn to interpret-and attend to the sounds-especially speech-in their environment, to increase the rate and quality of their social and communicative development. For patients with bilateral hearing impairment, bin aural hearing aids provide the most natural hearing and the best sound localization and speech discrimination, for patients who cannot wear a hearing aid because they are born without external car canals or suffer from recurrent ear infections, implantable hearing aids may be the answer. A magnetic device is attached to the skull under the skin behind the auricle. An external magnet on the hearing aid secures it to the implanted magnet. Sound is delivered directly through the skull bone to the inner ear the device works well in patients with nearly normal bone conduction.

Cochlear Implant

A cochlear implant works by bypassing damaged or missing hair cells and stimulating the hearing nerve directly. A cochlear has external component a sound processor and a head piece. It also has internal parts the Implant and the Electrode Array that are implanted by surgery and cannot be seen.

Conclusion

Future is very exciting and would be glorified by advancement and progress in better technology of cochlear implant. By ideas whose time has come and fantasying visions to peep ahead with possibility of Gene therapy, Immuno-therapy and more efforts for the rehabilitation of a person who lives in an isolated and silent world.

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