6.21 Hearing loss

See Background Paper 6.21 (BP6_21Hearing.pdf)

Background

The ability to hear is critical to understand the world around us and to interact with each other. Hearing impairment is the most frequent sensory deficit in human populations and affects newborns, children, adults, and the elderly.\(^1\)

Hearing impairment can be caused by a number of factors including: measles, mumps, and meningitis; chronic otitis media; exposure to excessive or prolonged noise; head and neck injuries; the use of ototoxic medications including certain types of chemotherapies and antibiotics; industrial solvents; congenital abnormalities and infections and perinatal problems; certain nutritional deficiencies; genetic disorders; and ageing.

In 2008, the WHO estimated that over 360 million people (5.3% of the global population) have disabling hearing loss – 80% of them in low- or middle-income countries. These figures are expected to rise substantially in the future due to ageing of the global population.

\begin{figure}[h]
\centering
\includegraphics[width=\textwidth]{figure6.21.1.png}
\caption{DALY rates caused by hearing loss by sex and region}
\end{figure}


Despite the high global burden of hearing impairment, there is a lack of statistics and epidemiological surveys in both high- and low-income countries due to poor diagnosis and reporting.\(^3\) The need for standardized procedures when collecting and reporting
epidemiological data on hearing loss is essential. Only a few countries, even in Europe, have implemented population-wide screening programmes.

Hearing loss is an important public health concern with substantial economic costs and social consequences. In infants and children hearing impairment retards developmental language and educational progress. In adults, it causes difficulties in both professional and social life as well as stigmatization. Medical costs (for hearing aids, for example) account for only a small percentage of the overall cost. In Europe, untreated hearing loss is estimated to cost €213 billion a year.\textsuperscript{4,5}

A number of key measures are needed to help reduce the burden of disease. They include: prevention of excessive exposure to noise; prevention of infectious diseases through vaccination; hearing screening programmes; raising awareness among users of the risks of ototoxic medications; genetic counseling (for some inherited causes of hearing loss); raising awareness among decision makers of the need to monitor the incidence and prevalence of hearing loss in the entire population, ranging from infants to the elderly. Hearing aids and cochlear implants are currently the only available means to help people partially recover their hearing and communication skills. However, these devices can be very expensive and are not always affordable.\textsuperscript{5,6}

\textit{Developments since 2004}

Several European initiatives are supporting research through different projects on hearing aids and cochlear implants. Meanwhile, recent rapid advances in bioscience and technology make it realistic to envisage a pharmacological treatment for hearing loss related to hair cells caused by different factors. The approaches used are broad, ranging from a search for new pharmacological compounds, gene therapy, RNA silencing, and stem cells, to the discovery of new delivery routes for pharmacotherapy. Up until now, most of the research has been performed in academic research settings. However, pharmaceutical companies are now just starting to be interested by the potential market for new products for hearing loss.

Public-private partnerships to develop new approaches for hearing loss are likely to be created in the near future.

\textit{Remaining challenges}

Consortia of top-level European research and industrial partners will need to act together and contribute to strengthen the EU’s leadership on research into the pharmacological prevention and treatment of hearing loss. As the prevalence of hearing impairment in the world is very high this opens huge potential markets for pharmacological interventions.
6. Priority diseases and reasons for inclusion

Research needs

Research needs include:

- The development and use of large epidemiological surveys across age groups from neonates to the elderly, as well as the use of standardized methods of evaluation and reporting.
- Intensified efforts to develop protective pharmacological agents for hair cells and to research the use of stem cells and hair cells precursors. The highly promising results of research carried out over the past five years make it realistic to envisage a pharmacological treatment for hearing loss.
- More research on new, safer delivery routes for the administration of pharmacological agents into the inner ear.

References

4 Shield B. Evaluation of the social and economic costs of hearing impairment. Hear-it, 2006. Available at: http://www.hear-it.org