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EDITORIAL

Isolated or combined hearing impairment, balance and communication disorders

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The worldwide prevalence of disorders affecting hearing (1–7), balance (8–12) and communication (13–15) is known to be high and is associated with considerable public health and socioeconomic costs (16). There are many scientific journals dedicated to these issues. In everyday clinical practice, physicians often have to manage patients presenting with either one or a combination of these disorders. In childhood, there are numerous congenital malformations or congenital infections that may involve both the cochlear and vestibular organs, consequently impairing not only hearing or balance but also indirectly affecting a child's communication skills. A similar situation occurs in elderly patients who are more likely to complain of hearing, balance and communication difficulties.

Why do we need a journal that considers hearing, balance and communication matters at the same time?

From a physiological point of view, it is easy to speculate that hearing provides vital feedback for important motor activities, such as voice and speech, which are key functions in oral communication. More interesting are recent developments in the literature linking speech perception with speech production (17,18). It also seems obvious that, in society, hearing is vital for language acquisition. The impact of balance on voice, speech and language is less straightforward, but it has been suggested that posture plays a key part in language development (19).

In addition, from a theoretical standpoint we might consider two possibilities:

- hearing/balance disorders having an impact on communication; and
- hearing/balance disorders concurrent with communication disorders, with no causal relationship between them.

The communication skills of patients with hearing impairments could be affected differently depending upon the age of presentation. Profound neonatal deafness interferes with the speech production and language development of a child, and partial hearing impairment in an older patient affects his ability to listen in noisy environments, affecting the volume of his voice, which may be unpleasant to those around him. Central auditory processing disorders can negatively affect language development, leading to difficulties in recognition and interpretation of speech sounds, thus affecting a child's reading or writing skills.

There are medical conditions in which hearing and/or balance disorders occur concurrently with communication problems, as in the case of brainstem lesions such as those due to stroke or multiple sclerosis. In this case, severe balance disorders will be present together with hearing difficulties and speech and swallowing impairments. It has recently been shown that patients with functional dysphonia often have postural difficulties (20,21). Finally, hearing and communication difficulties share similar rehabilitation tools. For instance, it is known that a delayed auditory feedback may significantly reduce stammering, and that the Lombard effect can be used to treat psychogenic dysphonia. Reducing hearing feedback also plays a part in reducing volume in using loud voice speakers.

The auditory rehabilitation of patients with hearing impairment or communication problems should take place in an environment of similar acoustics. Reduction of background noise or an increase of speech-to-noise ratio in schools, would be helpful for hearing impaired children as well as teachers with voice disorders.

There is a clear need for a shared space or forum for discussing the medical and scientific rehabilitative aspects of hearing, balance and communication disorders.

There is no other comprehensive scientific journal dedicated to this clinical and research area and, in our

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opinion, the new Hearing, Balance and Communication journal can play an important role in closing that gap. It can serve as a meeting place for physicians and other health professionals as well as scientists from different backgrounds who share an interest in the clinical and research issues of this broad field.

There is also another aspect to bear in mind: in the last 20 years, basic research in areas such as physics, cellular and molecular biology, genetics, genomics, proteomics, bioinformatics and biostatistics, biosensoristics, psychophysiology, neuropharmacology, neuroimaging, nanotechnologies, nanomedicine, stem cells, and many others, have made enormous advances. However, these developments have to date only had a limited influence on the diagnosis and treatment of diseases involving hearing, balance and communication. As already mentioned in an editorial some time ago (22), there is a fundamental need for translational research in that area. This journal may serve this purpose.

Last but not least, there is a growing worldwide interest in this area and demand for expertise in diagnosis and management of patients with hearing, balance and communication disorders. More than 500 people from more than 15 countries attended the last international symposium of the IAPA (International Association of Physicians in Audiology) held in Beijing in October 2012. Furthermore, after many years of a 'quiet' life for the Association, the last two years in particular have seen the arrival of many new members joining the Association and the creation of some very active national groups (especially in China, Egypt, Denmark ...), so it would seem that Hearing, Balance and Communication comes at just the right time.

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