

THE 12TH EUROPEAN SYMPOSIUM ON PEDIATRIC COCHLEAR IMPLANTS (ESPCI), JUNE 18–21, 2015, TOULOUSE, FRANCE

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The 12th European Symposium on Pediatric Cochlear Implants (ESPCI) was held in Toulouse, France on 18–21 June 2015. The first ESPCI was organized in 1992 in Nottingham and since then the growing interest in pediatric cochlear implantation, as well as increasingly higher levels of research presented at each of the subsequent meetings, has made this series popular, and not only in Europe. Incidentally, the Institute of Physiology and Pathology of Hearing (IPPH) organized the 9th ESPCI in 2009. This year, over 1700 participants gathered from all over the world. The theme of this ESPCI was 'Emerging concepts and emerging talents in cochlear implants', as the organizers wanted to promote new ideas concerning this multidisciplinary domain. Over 700 papers were presented as keynote lectures, round table discussions, podium presentations, posters, workshops, and instructional courses.

The main topics of this year ESPCI meeting were:

- Translational research in cochlear implants (CIs) concerning new sound processing and stimulation strategies, auditory pathway imaging, robotic surgery, binaural hearing, gene therapy, and drug delivery
- Health technology appraisal in relation to cost-effectiveness of extending indications for cochlear implantation, quality of life studies, evidence based of new rehabilitation programs
- Long term management and outcomes after CI regarding parental issues, music appreciation, educational outcomes, academic development, and socio-economic status
- Novel clinical challenges related to vestibular function in CI patients, cochlear implantation in multi-handicapped children, universal new-born hearing screening, cochlear implants in single-sided deafness, and severe hearing loss
- Surgery with reference to preservation of residual hearing, revision surgery, complex cases, and other surgical issues related to cochlear implants.

To share the experience in those diverse fields, a large place was set aside for instructional courses on rehabilitation, audiology, surgery, and cochlear implant fitting.

During plenary sessions there was a lot of discussion on hearing preservation and the idea of minimizing the trauma of cochlear implantation. As an expert in the field, Prof. Henryk Skarzynski pointed out that atraumatic cochlear implantation is crucial, not only in patients with residual hearing, but also from the perspective that the same cochlea may need to be implanted several times during the life of a child. In addition, well-preserved cochlear structures increase an implant's quality of electric stimulation. Other



Delegates from the Institute of Physiology and Pathology of Hearing

papers presented during ESPCI supported this view, and showed that cochlear trauma can be reduced by using atraumatic surgical techniques and good surgical planning – imaging should be used to estimate the optimal length of the array and the accessibility of the round window. A wide range of electrode arrays can be successfully used for residual hearing preservation and with low risk of dislocation to scala vestibuli.

Different approaches to drug delivery for hearing preservation and objective measurement for cochlea health assessment were also presented. The concept of an approach to the cochlea using computer-assisted navigation and robotic assistance for minimally invasive implantation was also debated.

Much discussion was held over bilateral sequential cochlear implantation as well as over cochlear implantation in single-sided deafness. Results presented by speakers from different clinics around the world, including specialists from IPPH, demonstrated the benefits of bilateral cochlear implantation on language development and speech comprehension. However, a strong association was reported between higher levels of performance and a short time interval between the first and second implants.

Discussion also covered the audiological outcomes of bilaterally implanted children as well as cochlear implantation in single-sided deafness. A recurrent concern was the development of central auditory pathways in these groups of patients. Recent studies reveal asymmetric development

of the auditory cortex in congenital single-sided deafness or in unilateral cochlear implantation in early childhood. Unilateral stimulation of the auditory system reorganizes the developing auditory pathways toward the hearing/stimulated ear, with weaker central representation of the deaf ear. Delayed intervention limits the possibility of binaural effects developing in these groups of patients in a way similar to that in the normal hearing population. Therefore, for restoration of binaural hearing and for improving the perceptual abilities of implanted children, asymmetric hearing needs to be identified early and intervention undertaken within the sensitive period of auditory development.

A lot of attention was also focused on longitudinal rehabilitation outcomes in CI children. Apart from results of language development, research findings covered the functional outcomes of rehabilitation including school achievement, work options, and quality of life assessment. Novel approaches to rehabilitation were also presented. Better access to telecommunication infrastructure allows telerehabilitation programs to be implemented. The use of social media for patient counseling, education, and coaching were also discussed.

Poland was represented in ESPCI 2015 by delegates from the Institute of Physiology and Pathology of Hearing, Medical University of Warsaw, Children's Hospital in Bydgoszcz, Poznan University of Medical Sciences, Clinic of Otolaryngology in Szczecin, and Foundation Orange. Delegates from IPPH presented 25 studies. They covered partial

deafness treatment in children, hearing preservation using different electrodes, expansion of the criteria for Electric-Acoustic Stimulation, cochlear implantation in cases of congenital middle and inner ear malformations (including children), results with different auditory implants (bone conduction and middle ear implants), optimization of parameters for electric stimulation in children with the use of objective measurements, auditory evoked potentials in patients with partial deafness, adaption of a 'Generic instrument for health-related quality of life assessment', auditory development of children implanted before 2 years old, school achievements of implanted children, bilateral sequential cochlear implantation in children, single-sided deafness cochlear implantation in children, and experience with auditory brainstem implants in children.

Delegates from IPPH were also invited to a round table discussion on telefitting and, in one of the workshops, to present their experience with remote rehabilitation. The National Network of Teleaudiology implemented by the Institute has been recognized as a model for similar implementations in other countries.

This year's symposium provided the exceptional opportunity to meet the pioneers of cochlear implant development and clinical implementation: Prof. Claude-Henri Chouard, Dr Ingeborg Hochmair, and Prof. Graeme Clark who, together with Prof. Blake Wilson, were given awards from Paul Sabatier University of Toulouse for their outstanding work in the field.