

REPORT ON THE 10TH INTERNATIONAL TINNITUS RESEARCH INITIATIVE CONFERENCE, 16–18 MARCH 2016, NOTTINGHAM, U.K.

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The first international meeting of a new group – EU COST Action (TINNET) – was held during the 10th Tinnitus Research Initiative (TRI) conference titled „Tinnitus subtypes, mechanisms and interventions”. Both conferences focused on ways of subtyping tinnitus, hypotheses about the mechanisms behind tinnitus, and the most effective intervention methods. More than 200 specialists from around the world attended the conference in Nottingham, U.K., from 16–18 March 2016.

The scientific program included 15 scientific sessions (64 podium presentations) and 2 poster sessions (111 posters). There were 9 invited lectures. Invited guests included Dr Winfried Shlee and Dr Michael Landgrebe, from Rosenburg University, and Prof. Karl Friston from London University. All lecturers strongly emphasized the necessity to understand tinnitus as a heterogenic occurrence. They outlined aspects of the database organized by TRI which will help in developing new methods of treating tinnitus.

Dr David Baguley, Director of the Audiology and Cochlear Implants Department of the University Hospital, Cambridge, presented a lecture on the current state of knowledge concerning hyperacusis (HA). The number of scientific reports regarding this condition is growing in the contemporary literature. Hyperacusis has been thoroughly described, and is now divided into subgroups such as loudness HA, annoyance HA, fear HA, and pain HA. Nevertheless, there is still not much information on the epidemiology of the condition. Results of studies on the occurrence of hyperacusis, both in adults and in children, are inconclusive and differ from one another.

Significant indications concerning good medical practice in the case of tinnitus occurring in children were presented by Dr Veronica Kennedy, an audiologist and member of the TINNET group. Dr Kennedy quoted the results of research conducted by a team at the Institute of Physiology and Pathology of Hearing in Poland concerning the incidence of tinnitus in children. She emphasised that it is important to provide treatment for “the *child* with tinnitus”, not “the child with *tinnitus*”.

Prof. G. Andersson from Linköping University gave an interesting lecture on the benefits of therapy conducted via the Internet, and Prof. Josef Rauschecker from Georgetown University presented a model of the development

and perception of chronic tinnitus. Prof. Susan Shore from Michigan University discussed results of research on mechanisms behind tinnitus originating in the cochlear nucleus and upper levels of the auditory pathway. An interesting theory on hidden hearing loss and tinnitus due to cochlear synaptopathy (not deterioration of hearing cells) was presented by Prof. Charles Liberman from Harvard University.

The Polish contingent was represented by a team from the Institute of Physiology and Pathology of Hearing (IPPH) – Dr Anna Fabijanska, Dr Danuta Raj-Koziak, Dr Monika Lewandowska, Assist. Prof. Piotr H. Skarzynski, and Joanna Rajchel – and a team from Lodz – Prof. Magdalena Korczynska and Dr Anna Pajor.

Dr Anna Fabijanska from IPPH presented a paper on cochlear implantation in patients with sudden single-sided deafness and coexisting tinnitus. Her data indicates a reduction of tinnitus in 80% of subjects, and the patients did not suffer postoperative complications or increased tinnitus. On this basis, Dr Fabijanska recommended cochlear implantation as a safe and effective therapeutic procedure in patients with severe to profound single-sided deafness with coexisting tinnitus. The issue of childhood tinnitus is important but remains poorly understood. Dr Danuta Raj-Koziak from IPPH presented data on clinically significant tinnitus in 12-year olds, indicating the existence of clinically important tinnitus (lasting more than 5 minutes) in 20% of examined children, of whom 25% reported constant tinnitus. The results indicate the need to continue research in this area, so that diagnosis and therapy can be used to reduce the negative impact that tinnitus has on these children's everyday lives.

In Polish, there are currently no tools with proven reliability and validity to assess the impact of tinnitus on the lives of patients. Assist. Prof. Piotr Skarzynski presented initial results of the Tinnitus Handicap Inventory (THI) adapted to the Polish language. THI is one of the questionnaires most frequently used and recommended in clinical practice around the world. Initial results indicate that in nearly half the patients tinnitus is so annoying that it interferes with their emotional and social life. The research shows that gender, age, or degree of hearing loss do not affect the impact that tinnitus can have.

During a session devoted to brain imaging, Dr Monika Lewandowska from IPPH presented magnetic resonance imaging results of resting state functional connectivity (FC) in tinnitus patients. FC is defined as a correlation of fMRI signal fluctuations between at least two different brain areas. The authors identified altered FC patterns in two different tinnitus subtypes distinguished on the basis of tinnitus characteristics (intrusiveness, duration, etc.) and the patient's audiogram. The second talk by Dr Lewandowska concerned tonotopic organization of the primary auditory cortex in subjects with tinnitus and normal hearing. The presentation included preliminary outcomes on correspondence between a patient's audiogram profile and their tonotopic map.

Very interesting results were presented during the brain imaging sessions by Dr Lanting from Groningen University. He delivered a lecture on neuronal networks observed in people suffering from tinnitus. He observed brain activity in tinnitus sufferers while they were watching a touching movie and in a "resting" state. In both conditions it was shown that the area of the default mode network (DMN) is less synchronized in patients with tinnitus than in a control group. Moreover, unlike what is seen in healthy

subjects, in tinnitus subjects DMN involvement did not increase much in the resting state compared to when performing a specific task.

The Nottingham conference was a very interesting meeting, and a great place for exchange of knowledge and experience between scientists and clinicians from around the world. The lectures presented up-to-date knowledge, and raised crucial diagnostic and therapeutic issues. Nevertheless, despite intensive research, many aspects of tinnitus – such as its etiology and objective measurement – have yet to be fully developed and require more in-depth work.

A crucial element to develop knowledge of tinnitus is collaboration between international interdisciplinary expert teams, such as TINNET and the Tinnitus Research Initiative. TINNET is continuing to develop guidelines for diagnosis of complex cases and to help tinnitus patients.

IPPH has been chosen to organize the 1st World Tinnitus Congress and XII International Tinnitus Seminar in 2017 in Warsaw, Poland, 25–27 May 2017. Entrusting the organization of these events to the Institute is recognition of the achievements of Prof. Henryk Skarzynski and his team.