

Scientific advances in headache research: an update on neurostimulation

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The pathophysiological understanding of migraine and other primary headaches has been substantially improved over the last 20 years. A milestone that paved the way for successful research was the development of the International Classification of Headache Disorders published by the International Headache Society in 1988. The classification facilitated a clear clinical diagnosis of headache disorders and allowed research efforts to be focused on clearly defined syndromes. Recent advances in the understanding of headache disorders have been driven by the availability of new research tools, such as advanced imaging techniques, genetic tools, pharmaceutical compounds and devices for electrical or magnetic stimulation. The latest scientific and clinical advances were presented at the recent European Headache and Migraine Trust International Congress (EHMTIC) in London (UK).

The European Headache and Migraine Trust International Congress (EHMTIC) was held from 20 to 23 September in London, UK. The scientific program of this biennial congress included several informative teaching courses on experimental techniques for migraine research as well as clinical management of migraine and other primary headaches. Tobias Kurth from Bordeaux University (Bordeaux, France) opened the congress with the MacDonald Critchley lecture on migraine genetics epidemiology. The scientific core of the congress were multiple poster sessions covering basic laboratory and experimental clinical science on novel aspects of the pathophysiology of headache disorders, clinical aspects of headache care and recent advances in the acute and preventative treatment of migraine. Beside the poster sessions, lectures were given for the awarding of the Enrico Greppi Award and the Giuseppe Nappi Cluster Headache Award conferred to Sait Ashina (Beth Israel Medical Center, NY, USA) and Delphine Magis (University of Liège, Liège, Belgium) for their respective research contributions on depression and risk of transformation of episodic to chronic migraine, and central mechanisms of occipital nerve stimulation (ONS) in cluster headache. The Migraine Trust lecture was given by Karl

Messlinger (University of Erlangen–Nürnberg, Germany), who provided an extensive overview of the neurobiology of migraine. Finally, in the Jes Olesen EHF lecture Rigmor Jensen (Danish Headache Center, Copenhagen, Denmark) presented the recent advances and challenges in headache research.

Neurostimulation is of increasing interest for the treatment of primary headaches. Initial experiences with invasive methods, such as deep brain stimulation for drug-refractory cluster headache, have been effective but were hampered by severe side effects. Research efforts are now being focused on noninvasive or minimally invasive neurostimulation therapies that could be used in less disabled patients. A variety of neurostimulation devices and first data about their potential efficacy were presented at the conference and are reviewed here.

Noninvasive neurostimulation devices Transcranial magnetic stimulation

Transcranial magnetic stimulation (TMS) is an established method to modulate cortical excitability and has been used for several neurological purposes for many years. Holland *et al.* demonstrated in an *in vivo* model of migraine, that single-pulse TMS (sTMS) was able to inhibit

New Advances In Headache Research

Judd E. Hollander



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