



Introduction

Individualized epilepsy management: Medicines, surgery, and beyond



This Special Issue is based on invited presentations and selected abstracts from the 11th International Epilepsy Colloquium, which was held from March 12 to 14, 2018 in Frankfurt, Germany (Fig. 1). The International Epilepsy Colloquium represents a joint initiative of several leading university hospital epilepsy centers from France, Germany, the United Kingdom, and the United States. It aims to reflect and promote clinical and scientific advances in epilepsy treatment and, as such, is one of few international meetings focused mainly on epilepsy surgery (Table 1). Several of these Colloquia have resulted in the publication of books or special issues of international journals [1–4].

This year's topic was "Individualized Epilepsy Management: Medicines, Surgery, and Beyond", and the aim was to position epilepsy surgery, that is personalized treatment, at its best into context with the other new individualized approaches that are available. Current standard treatments are mainly symptomatic and seizure-suppressive and generally fail to render seizure-free the substantial proportion of patients with a drug-refractory course of disease. This treatment gap imposes a major burden on affected patients, their caregivers, and society [5–7]. Personalized and/or precision medicine approaches can help to bridge this gap and are based on translational epilepsy research [8,9]. The purpose of this issue was to provide insight into the current state-of-the-art and future avenues of individualized approaches to managing difficult-to-treat, drug-refractory epilepsy cases.

Steinhoff and Staack looked into the question of which surgical treatment could or should be considered for use for patients, even when the epilepsy is classified as drug-responsive or not yet refractory [10]. Another important question to consider is whether or not there are age limitations in the performance of epilepsy surgery. O'Dwyer et al. suggested that age is but a number when considering epilepsy surgery in older adults [11]. Technical aspects and limits regarding resection borders for epilepsy surgery in the primary motor cortex were reviewed by Ostergard and Miller [12]. Separately, Rössler et al. provided an overview of the current role of intraoperative electrocorticography in resective epilepsy surgery [13]. Additionally, a review by Schulze-Bonhage focused on the long-term outcomes seen with the neurostimulation of epilepsy [14].

Invasive electroencephalography (EEG) is associated with certain risks that users need to be aware of. Willems et al. reported their thorough analysis of complication rates associated with stereo-EEG electrodes during implantation, video-EEG monitoring, and explantation. They compared their results with data systematically reviewed from the literature [15]. Spyranitis et al. evaluated electrode placement accuracy in robot-assisted epilepsy surgery. Moreover, a comparison of different referencing techniques including frame-based computed tomography (CT) versus facial laser scan based on CT or magnetic

resonance (MR) imaging found that MR-based referencing alone is less accurate than a CT-based approach [16].

Neuropsychology is a crucial part of a thorough presurgical workup. Conradi et al. reported on their analysis of functional transcranial Doppler sonography used for hemispheric language lateralization in patients with epilepsy; specifically, they found that test–retest reliability can be improved by the addition of a qualitative evaluation to complement the standard statistical examination [17].

Patients' safety and wellbeing during and after video-EEG monitoring is receiving more and more attention in both clinical practice and guidelines [18,19]. Egger-Rainer et al. reported a recently developed instrument to assess comfort in the epilepsy monitoring units [20].

Pattern recognition helps in the identification of new entities or syndromes. Neurophysiological analysis of distinctive epileptogenic networks seen in parietal operculum seizures were characterized in one study by Wang et al. [21]. Furthermore, Hartlieb et al. described the age-related MR characteristics seen in patients with mild malformation of cortical development with oligodendroglial hyperplasia and epilepsy (MOGHE), a distinct neuropathological entity that should be looked into in children and young adults [22]. New-onset epilepsy in the elderly is usually assumed to be caused by structural lesions. However, elderly patients with epilepsy with nonlesional MR imaging findings do exist. Süße et al. have reported the semiology, EEG, cerebrospinal fluid, and seizure outcome characteristics in this population [23].

The consumption of alcohol among people with epilepsy remains controversial [24]. Gütmane et al. suggested alcohol-related seizures to be a predictor of severe depression and alcohol dependence syndrome [25].

Patients with ongoing seizure face a degree of reduced mobility. Willems et al. looked into the noncompliance of patients with driving restrictions and were able to show that permanent employment,

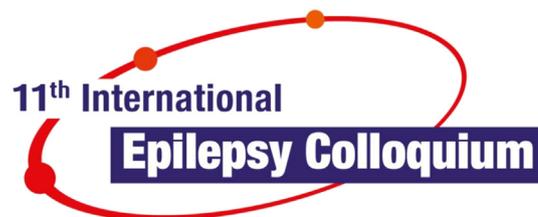


Fig. 1. The logo of the 11th International Epilepsy Colloquium held from March 12 to 14, 2018 in Frankfurt, Germany. Course directors were Felix Rosenow (Frankfurt), Hajo M. Hamer (Erlangen), Susanne Knake (Marburg), and Adam Strzelczyk (Frankfurt).

Table 1
List of International Epilepsy Colloquia and major topics addressed since 2008 in the field of epilepsy surgery and clinical epileptology.

Year	Topic	Place	Related reference
2008	The mesial temporal lobe epilepsies	Marburg, Germany	Book [1]
2009	Pediatric epilepsy surgery	Lyon, France	
2010	Extratemporal lobe epilepsies	Cleveland, OH, USA	Book [2]
2011	Epilepsy surgery for remote symptomatic epilepsies	Marburg, Germany	
2012	Pediatric epilepsy surgery	Lyon, France	
2013	Tumoral epilepsy and epilepsy surgery	Cleveland, OH, USA	Special issue [3]
2014	Diagnostic and therapeutic use of invasive electrodes	Marburg, Germany	Special issue [4]
2015	Frontal lobe epilepsies: from childhood to adulthood	Grenoble, France	
2016	Epilepsy in acquired etiologies	London, UK	
2017	The surgical and medical management of intractable focal epilepsy	Miami, FL, USA	
2018	Individualized epilepsy management: medicines, surgery, and beyond	Frankfurt, Germany	Current special issue
2019	Treatment challenges in pediatric and adolescent epilepsies	Lyon, France	

freelance work, the absence of a relevant disability, and living alone are predictors for driving despite an uncontrolled epilepsy [26]. These findings highlight the need for specialized and generally available social counseling to exist, with a special focus on vocational and career guidance to overcome epilepsy-caused driving restrictions [7,27].

The last three articles of this special issue focus on the characteristics, treatment, and prognosis of clearly defined epilepsy syndromes with genetic causes such as tuberous sclerosis complex (TSC) or Dravet syndrome. Such epileptic encephalopathies are typically associated with a disease burden beyond seizures and require novel therapeutic and disease-modifying approaches [28–30]. Koch and Weber summarized the existing knowledge on glucose transporter type 1 syndromes [31], while Schubert-Bast et al. discussed the potential role of mechanistic target of rapamycin inhibitors in preventing epileptogenesis in patients with TSC [32]. Separately, Polster reported on the use and characteristics of fenfluramine, which is about to be approved for the treatment of Dravet syndrome [33].

In the coming years, we will likely see a dramatic increase in personalized medicine that will significantly contribute to the management of drug-resistant epilepsy in particular. This Special Issue presents a compilation of different studies, which increases the visibility of the high burden associated with epilepsy, and also provides directions as to how personalized approaches may help to overcome this burden.

The 12th International Epilepsy Colloquium will take place from May 26 to 28, 2019 in Lyon, France and will be dedicated to the subject of “Treatment challenges in pediatric & adolescent epilepsies” (www.epilepsy-colloquium2019.com).

Conflict of interest

The authors declare that there is no conflict of interest.

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27 September 2018