

Training and workforce: an expert panel presents a new approach to epilepsy in the tropics

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The development of new treatments and effective strategies to prevent or reverse human diseases must be the main goal of the health systems of a nation. This objective is easily established when the system effectively translates the results of biomedical research into clinical practice and uses these results to make decisions regarding health policies. Translational medicine is the basis of this type of progress, constituting a continued process that involves the direct application of discoveries made in research laboratories to the development of studies in human beings. In addition, translational medicine brings together all the results from relevant studies and applies them in clinical practice in an attempt to improve health conditions and the quality of life of the population and facilitate the adoption of the best medical practices by the community. Thus, it has been recognized by the leading scientific journals and the major funding agencies that neuroscience is a biomedical field that is growing more rapidly in the developing world than in developed world. This observation is also valid for Latin American countries, particularly Brazil. This fact can be clearly demonstrated by the study performed by Nitrini in 2006, which evaluated 295 Brazilian clinical neuroscientists and their publications (1). He showed that more than 40% of Brazilian papers were published in *Arquivos de Neuro-Psiquiatria*, the official journal of the Brazilian Academy of Neurology, and that epilepsy is one of the sub-areas with the highest level of scientific production (1). The focus of scientific research on epilepsy is justified for several reasons.

According to the International League Against Epilepsy (ILAE), epilepsy is defined as the transient occurrence of signs and/or symptoms due to abnormal, excessive, or synchronous neuronal activity in the brain (2). Epilepsy is a neurological condition that knows no geographic, social, or racial boundaries, occurring in men and women and affecting people of all ages, although it more frequently affects young

people in the first two decades of life and people over the age of 60 years (3,4). From an epidemiological point of view, epilepsy is among the most common serious neurological conditions, and it has a prevalence of approximately 1% in developed countries (1,5). Annually, 24 per 100,000 persons suffer from epilepsy in Europe, and 53 per 100,000 are affected in North America (5-7). In developing countries, the incidence is higher than that in industrialized countries, and up to 190 per 100,000 individuals suffer from epilepsy (8,9).

Because epilepsy is a chronic disease, several factors have a negative impact on the quality of life of patients with epilepsy (3). There is a general consensus that stigma and exclusion are common features of epilepsy in both developed and developing countries (3,10). Furthermore, epilepsy often has profound physical, psychological, and social consequences because seizures may cause misunderstanding, fear, secrecy, stigmatization, and social isolation (3,10). All facts reported above have been confirmed by the ILAE's reports, reinforcing the hypothesis that the psychosocial effects experienced by persons with epilepsy are not always a consequence of the course of the disease but often result from discrimination and misconceptions about this condition (11).

From another perspective, we can ask the following question: what are the main causes of epilepsy in the tropics that result in these multifaceted problems? Certainly, several factors may explain the high prevalence of epilepsy in the tropics, such as a higher rate of exposure to prenatal risk factors, a very high frequency of head injuries and the presence of various parasitoses of the central nervous system (CNS) (12-14). Among these causal factors, endemic parasitic diseases are most likely the most common preventable risk factors for epilepsy worldwide (12-14). In the mid-1990s, the ILAE established a special Commission on Tropical Diseases to comprehensively evaluate the epidemiology, etiology, pathophysiology, immunologic diagnosis, prognosis, treatment, and socioeconomic risk factors to identify solutions to the problems faced by patients with epilepsy in the tropics (15-17).

It has been demonstrated by several researchers that various parasitic diseases are important causal factors of epilepsy in individuals living in the tropics. These diseases include neurocysticercosis, cerebral malaria, neurotoxoplasmosis, neuroschistosomiasis (bilharziasis), and cerebral Chagas disease (American trypanosomiasis) (12,18). According to the studies of Finester and Auer (18), because

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the outcome of cerebral parasitoses is dependent on early and effective treatment, diagnostic procedures need to be optimized and made available, particularly in endemic areas (18). Furthermore, these researchers also believe that parasitoses are still a worldwide health problem, the solution for which requires the cooperative effort of global, regional and local health authorities and also the education of those at risk of becoming infected (18). Obviously, we are in complete agreement with these suggestions and take the opportunity to note that the global campaign evaluated in 1997 by the World Health Organization (WHO), the International League Against Epilepsy (ILAE), and the International Bureau for Epilepsy (IBE), called Global Campaign against Epilepsy: Out of the Shadows, had as its mission statement to improve the acceptability, treatment, availability of services, and prevention of epilepsy worldwide (19). To do so, several goals were carefully delineated to increase public and professional awareness of epilepsy as a universal, treatable brain disorder: to raise epilepsy to a new plane of acceptability in the public domain; to identify the needs of people with epilepsy on a national and regional basis; to encourage governments and departments of health to address the needs of people with epilepsy, including awareness, education, diagnosis, treatment, care, services, and prevention; and to promote public and professional education about epilepsy (19). Regarding the educational efforts, Latin American researchers have established plans and developed highly specific actions with the aim of meeting these goals. The Latin American Summer School on Epilepsy (LASSE), a program run by the Educational Program of the ILAE with the support of the Brazilian League of Epilepsy (BLE), has an important role in meeting these goals.

In 2002, the summer schools on epilepsy became a new didactic experience. These schools have been run by the International School of Neurological Sciences, in Venice, Italy, with the participation of researchers in basic and clinical fields related to epilepsy. Because professors and students are in contact for two consecutive weeks, this specific school has facilitated the integration of these two groups, allowing a better understanding of how new discoveries benefit people with epilepsy. Based on this successful experience and with the implementation of an Educational Program for the ILAE in 2006, we are also expanding this type of activity to the countries of Latin America, with the objective of improving the knowledge of the basic and clinical neuroscientists who are active in this field. In brief, the aim of the LASSE is to teach attendees to acquire basic knowledge about the pathophysiology of epilepsy to promote the understanding of the clinical aspects of epilepsies and to benefit from the mutual exchange of information between basic scientists and clinicians. Furthermore, it is important to note that the LASSE primarily targets physicians currently in training or who have recently specialized in neurology or other related fields and research scientists from academia and the pharmaceutical industry who have an active interest in epileptology.

Finally, we would like to note that we will continue to offer such a summer course, and we have the great satisfaction of announcing that, in 2013, the primary topic of the VII LASSE will be *Seizures and Epilepsy in the Tropics*. We are sure that this program will be highly successful, with contributions from and participation by researchers and students at all levels (undergraduate master's and PhD) in the field of neuroscience in Latin America.

■ REFERENCES

- Nitrini R. The scientific production of Brazilian neurologists: 1995-2004. *Arq Neuropsiquiatr*. 2006;64(2B):538-42, <http://dx.doi.org/10.1590/S0004-282X2006000300037>.
- Engel Jr J, Pedley TA. Introduction: what is epilepsy? Engel Jr J., Pedley TA. (Eds.), *Epilepsy: a comprehensive textbook*, Lippincott Williams & Wilkins-Wolters Kluwer Business, Philadelphia. 2008;1-11.
- de Boer HM, Mula M, Sander JW. The global burden and stigma of epilepsy. *Epilepsy Behav*. 2008;12(4):540-6, <http://dx.doi.org/10.1016/j.yebeh.2007.12.019>.
- Sander JW. The epidemiology of epilepsy revisited. *Curr Opin Neurol*. 2003;16(2):165-70, <http://dx.doi.org/10.1097/00019052-200304000-00008>.
- Forsgren L, Beghi E, Oun A, Sillanpaa M. The epidemiology of epilepsy in Europe - a systematic review. *Eur J Neurol*. 2005;12(4):245-253.
- Hauser WA, Annegers JF, Kurland LT. Incidence of epilepsy and unprovoked seizures in Rochester, Minnesota: 1935-1984. *Epilepsia*. 1993;34(3):453-68, <http://dx.doi.org/10.1111/j.1528-1157.1993.tb02586.x>.
- Forsgren L. Epidemiology and prognosis of epilepsy and its treatment. S. Shorvon, E. Perucca, D. Fish, E. Dodson (Eds.), *The treatment of epilepsy*, Blackwell Science Oxford, Malden. 2004;21-42.
- Kotsopoulos IA, van Merode T, Kessels FG, de Krom MC, Knottnerus JA. Systematic review and meta-analysis of incidence studies of epilepsy and unprovoked seizures. *Epilepsia*. 2002;43(11):1402-9, <http://dx.doi.org/10.1046/j.1528-1157.2002.t01-1-26901.x>.
- Preux PM, Druet-Cabanac M. Epidemiology and aetiology of epilepsy in sub-Saharan Africa. *Lancet Neurol*. 2005;4(1):21-31, [http://dx.doi.org/10.1016/S1474-4422\(04\)00963-9](http://dx.doi.org/10.1016/S1474-4422(04)00963-9).
- de Boer HM. Epilepsy stigma: moving from a global problem to global solutions. *Seizure: the journal of the British Epilepsy Association*. 2010;19(10):630-6, <http://dx.doi.org/10.1016/j.seizure.2010.10.017>.
- International League Against Epilepsy (ILAE). The history and stigma of epilepsy. *Epilepsia*. 2003;44:12-14.
- Carod-Artal FJ. Tropical causes of epilepsy. *Rev Neurol*. 2009;49(9):475-82.
- Del Brutto OH, Carod-Artal FJ, Román G, Senanayake N. Tropical neurology. In *American Academy of Neurology, ed. Continuum*. Vol. 8. Philadelphia: Lippincott Williams & Wilkins. 2002;36-49.
- Duncan JS, Sander JW, Sisodiya SM, Walker MC. Adult epilepsy. *Lancet*. 2006;367(9516):1087-100, [http://dx.doi.org/10.1016/S0140-6736\(06\)68477-8](http://dx.doi.org/10.1016/S0140-6736(06)68477-8).
- de Bittencourt PR, Adamolekun B, Bharucha N, Carpio A, Cossío OH, Danesi MA, et al. Epilepsy in the tropics: I. Epidemiology, socioeconomic risk factors, and etiology. *Epilepsia*. 1996;37(11):1121-7, <http://dx.doi.org/10.1111/j.1528-1157.1996.tb01035.x>.
- de Bittencourt PR, Adamolekun B, Bharucha N, Carpio A, Cossío OH, Danesi MA, et al. Epilepsy in the tropics: II. Clinical presentations, pathophysiology, immunologic diagnosis, economics, and therapy. *Epilepsia*. 1996;37(11):1128-37, <http://dx.doi.org/10.1111/j.1528-1157.1996.tb01036.x>.
- Relationship between epilepsy and tropical diseases: Commission on Tropical Diseases of the International League against Epilepsy. *Epilepsia*. 1994;35(1):89-93.
- Finsterer J, Auer H. Parasitoses of the human central nervous system. *J Helminthol*. 2012;10:1-14, <http://dx.doi.org/10.1017/S0022149X12000600>.
- World Health Organization - Mental health. Global Campaign against Epilepsy: Out of the Shadows. http://www.who.int/mental_health/management/globalepilepsycampaign/en/index.html. Accessed: November 2012.