THE EPILEPSIES: ETIOLOGY AND PREVENTION. 

The one-time Cinderella speciality is now at the ball. The dull world of two seizures (petit mal, grand mal), two drugs (phenytoin, phenobarbitone) and too bad is history. Extraordinary advances in imaging, telemetry, anti-convulsants and the curative hope of surgery have put paid to much shoulder shrugging and placed epilepsy in its deserved spotlight. On to this stage is welcomed another epilepsy text.

Prakash Kotagal and Hans Lüders have brought together the proceedings of the 7th International Cleveland Clinic–Bethel Symposium (1996) on the aetiology and prevention of epilepsy. They deserve congratulations for co-ordinating an ambitious project, overseeing 150 international contributors to 64 chapters. The scope is broad with the book’s strength lying in its clear description of the main structural aetiologies of epilepsy, especially cortical dysplasia, mesial temporal sclerosis, tumours, trauma, vascular disease and infection. There is a fairly rounded feel to most subjects presented though it sometimes lacks the seamless transition between chapters that is so difficult to achieve in a multi-author hybrid. Multi-authorship gives breadth and a refreshingly varied approach but also frequent overlap in some areas and holes in others.

The Epilepsies: Etiology and Prevention might suggest a book whose first third would be molecular, biochemical and genetic, the areas where our understanding of the epilepsies and their treatments mostly continues to grow. Lüders and Kotagal actually pay remarkably scant attention to these aspects of epilepsy. Their emphasis on structural aetiology gives us a book that is more aimed at the practical clinician than at its rival texts. The low profile of molecular biology will be refreshing to those many physicians who develop absence status at the first mention of slow and fast ion channels, of AMPA or of GABA\(_B\). The closest we come in this book’s index to NMDA is NMD, but then here it means neuronal migration disorders.

Cortical dysplasia is detailed in a series of interesting chapters from a variety of distinguished authors. Most non-specialists would have welcomed an opening chapter illustrating normal neuronal migration. As imaging definition improves year on year, an increasing proportion of childhood and adult epilepsy is attributed to cortical dysplasia. This rapidly developing field cries out for a consensus classification and agreed terminology from which each author could have worked. At first sight, the high standards of individual authors seem a little let down by their use of differing terminology and by considerable overlap between chapters. Many have their own general introduction, frequently repeating information covered by previous authors. So intent are one pair to rehearse issues already covered that they almost forget to mention focal resection (the title of their chapter), giving it only half a page of their five. Yet the editorial freedom which allowed several versions of cortical dysplasia’s aetiology, classification and nomenclature makes fascinating reading. David Fish’s idea of a focal-generalized continuum probably best concurs with current thinking. Those appearing focal present later and more mildly, but can often be shown to have more generalized abnormalities. Focal cortical dysplasia surgery is more a ‘debulking’ than a lesionectomy.

Mesial temporal sclerosis (MTS) is the final pathological pathway resulting from a variety of insults to the susceptible developing brain, the hippocampus being able to respond in only a limited way. Mesial temporal lobe epilepsy (MTLE) is the best characterized of the chronic human epilepsies and certainly deserves separate categorization when the ILAE classification is next revised. Simon Harvey considers the complex and controversial relationship of MTS to febrile convulsions in a thoughtful chapter. The highlight of the book for clinicians is Kotagal’s exploration of seizure semiology in MTS. There is a helpful overview with useful tracings of EEG changes of MTLE but no separate account of MRI of MTS. There had been for cortical dysplasia. Even the description of MRI volumetry of MTS comprises prose but no picture. Functional imaging and magnetic resonance spectroscopy, but not magnetoencephalography, are covered in some depth.

There then follow some useful accounts of the causes of other symptomatic epilepsies. As an epileptogenic infection, cysticercosis is unrivalled worldwide. It is presented as an entirely avoidable condition where sanitary and socio-economic condition disgracefully combine to perpetuate its dissemination. Head injury is a major cause of intractable epilepsy and we have a discussion of the aetiology of post-traumatic seizures. Blood deposition in the neuropil provides the environment to combine hydroxyl free radicals to brain lipids, forming an epileptogenic focus; free radicals are released in a chain reaction dependent upon a constant supply of free iron. The place of acute treatment with methylprednisolone or \(\alpha\)-tocopherol in preventing post-traumatic epileptogenesis is discussed. However, the reader searching for a guide to the calculable clinical risk factors of post-traumatic epilepsy or clinical descriptions of trauma-related seizures (including the immediate ‘concussive’ convulsions of Australian Rules footballers) must look elsewhere. A little more on head injury and its risk of epilepsy would be appropriate in a text on epilepsy aetiology.

Bourekas and Perl provide an excellent, well-illustrated, well-referenced and up to date overview of epileptogenic tumours as the centre piece of this section. Tumour epileptogenicity increases with proximity to the Rolandic fissure and declines with increasing distance from the cortex. In considering tumours as the cause of epilepsy, the book’s focus is rightly upon CT-occult lesions, especially ganglioglioma and dysembryoplastic neuroepithelial tumour (DNET), whose management has been revolutionized by MRI. Their association with resistant epilepsy, yet an excellent prognosis following surgery, makes the mean delay of 10
years to diagnosis clearly unacceptable. The recognition of ‘dual pathology’ (e.g. the common association of cortical dysgenesis with DNET or the association of hippocampal sclerosis with some temporal lobe tumours) is the usual explanation for persistent seizures despite apparently adequate lesionectomy. Chronic changes or iron deposition in the surrounding cortex also account for surgical failures.

Vascular causes of epilepsy are clearly important, and especially so with increasing age. With a lack of good prospective data, we await guidance on the best deployment of available treatments for arteriovenous malformation (conservative management, excision, radiosurgery, embolisation). There is a clear case for a multidisciplinary approach (surgeon, physician, interventional radiologist) to decide with the patient their clinical management. Little has changed in the epilepsy risk assessment following stroke— as expected it is the large, cortical, haemorrhagic strokes that carry the greatest risk. Surprisingly, venous infarction and sinus thrombosis, potent causes of acute symptomatic seizures, are touched upon here only in passing.

The focus moves to paediatric symptomatic epilepsies and we are treated to a definitive chapter on pyridoxine-resistant epilepsy by Jean Aicardi and a thorough section on symptomatic neonatal epilepsies. Some confusion arises in the chapter on non-hereditary myoclonic epilepsies, which are largely lumped together under Lennox–Gastaut syndrome without considering myoclonic astatic epilepsy. Post-hypoxic action myoclonus is considered in a helpful descriptive account but disappointingly the treatment passes unmentioned and we must infer that there still is none. Immune conditions are well described by Anand and Dinner but coeliac disease, an important and perhaps immunologically treatable cause of epilepsy, is not discussed.

Occasional idiosyncratic abbreviations may raise an eyebrow. AVM is ingeniously defined by one author as ‘angiographically visible malformation’ to be distinguished from its angiographically occult cousin ‘AOVM’, e.g. cavernoma. Pre-M is defined as ‘before MRI’, D5W is unexplained but we are invited to dilute sodium amytyal with it. A Wader test (sic) on page 376 is not enlarged upon. ES is an epileptic seizure, PS a pseudoseizure and PPS a psychogenic pseudoseizure. In fact, if this book has a P.S. at all, it seems to be ‘Epilepsy and Genetics’, which inexplicably is relegated to the very end, behind even PS and PPS.

The genetics of epilepsy is fast becoming the most exciting area of epilepsy understanding and deserves much greater prominence than is offered here. Anna-Elina Lehesjoki has made a considerable contribution to our understanding of the genetics of progressive myoclonus epilepsies and presents a fine chapter. Dieter Janz has a colourful retrospective account of his own disorder—juvenile myoclonic epilepsy (JME). His and most clinicians’ first choice medication is valproate, but how many would concur with his second choices of primidone and phenobarbitone? Lamotrigine is dismissed as worsening myoclonic jerks and topiramate not considered. The term ‘juvenile’ may have its drawbacks when explaining the condition to someone presenting aged 80 years (as did one of Janz’s patients) but most adults are probably quite flattered. His preference for renaming JME ‘impulsive petit mal’ on the basis that ‘impulsio’ is Latin for ‘jerk’ would be a hard one to sell to the newly diagnosed British teenager.

Any genetic text risks becoming quickly outdated by rapid developments but the omission of any discussion of ADNFLE (autosomal dominant nocturnal frontal lobe epilepsy) from this, a 1999 book on epilepsy aetiology, is surprising. ADNFLE was described in 1995, a year before this symposium, and has been followed by several landmark papers. It was the first adult onset epilepsy to be genetically defined. One can hardly imagine a symposium today on epilepsy aetiology without the Melbourne group who described the syndrome heading the guest list. ADNFLE, though not indexed, does find one unexpected mention in a chapter entitled ‘Genetic Epilepsies – Generalized’ (it isn’t), deeply buried in a paragraph entitled ‘Juvenile Myoclonic Epilepsy’ (again), where even the most obsessional reviewer could miss it.

When you tire of epilepsy there is an interesting penultimate section of four chapters on psychogenic seizures. The initial thought of how this is part of the aetiology and prevention of epilepsy is balanced by its accounting for 20% of ‘epilepsy’ and rather more than 20% of epilepsy resources. In fact, I should have welcomed something more on the other main differential diagnoses of epilepsy, e.g. syncope. Panic disorder is arguably more important than conversion disorder in distinguishing blackouts since, though less dramatic, it is commoner and more often coexists with true epilepsy. Furthermore it is easily confused with complex partial seizures by both patient and doctor. Panic disorder receives only short mention in a great little paragraph on page 514, but really deserves its own chapter.

Epilepsy crosses the speciality boundaries giving this book a broad appeal. It is a practical clinicians’ book, light on matters molecular and genetic but strong on the structural basis for epilepsy. However, it is neither as fully comprehensive nor as up to date as its title and 1999 publication date would suggest. Nonetheless, it deserves to be well used from bookshelves of neuroscience and postgraduate departments and is recommended as an important reference text.

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