Post-traumatic Epilepsy

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Edited by
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Foreword

Epilepsy is a condition where individuals are prone to recurrent epileptic seizures. Of course, an epileptic seizure may be seen as a symptom, for which there are many different causes. We should therefore more accurately refer to the 'epilepsies' as a group of diseases. Head injury is a major cause of acquired epilepsy worldwide, particularly in resource-poor settings. Whether addressing prevention of head trauma, acute management, risk factors or the latent period prior to the development of the epilepsy, there are many areas where intervention could have an impact on overall outcomes.

This book brings together current evidence from a basic science as well as a clinical perspective with regard to head trauma and the development of post-traumatic epilepsy, collecting current evidence and addressing where it may sit with regard to management. As highlighted, severity of brain injury is a key factor in the likelihood of developing epilepsy, with an up-to 17-fold increased risk in those suffering a severe closed head injury and around a 50% risk associated with a penetrating injury. Despite this, relatively little attention has been given to this area, and it continues to be associated with poor psychosocial outcomes and high mortality. The book covers experience from animal models highlighting the different forms of head injury, translation to clinical care, and the multidisciplinary approach to address the prevention and management of morbidity and later onset epilepsy. It is timely in the light of ongoing international efforts to address risk factors as well as the unmet need.

This is one area where prevention of epilepsy is a real possibility; not only through the prevention and appropriate acute management of head injury, but also through recognition and intervention with regard to risk factors for the later development of epilepsy through biomarker recognition. What this book highlights is that the approach to post traumatic epilepsy is multifaceted; a collaborative approach is required to make an impact in future to reduce the prevalence and the associated comorbidities, so improving outcomes.

Professor Mula and the authors should be commended for this comprehensive piece of work.

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Preface

Epilepsy is one of most frequent neurological disorders, affecting about 50 million people worldwide, and post-traumatic epilepsy accounts for 10% to 20% of symptomatic epilepsies; nonetheless, research and clinical interest in post-traumatic epilepsy are still limited.

In order to find a volume with a similar title to this one, the reader would need to go back to 1949 with the publication of *Post-traumatic Epilepsy,* authored by Arthur Earl Walker, neurosurgeon, neuroscientist and epileptologist, remembered for the Dandy–Walker syndrome.

A PubMed/Medline search up to July 2020 using the search terms 'traumatic brain injury' AND 'epilepsy' generated 1,579 records against 3,032 for the combination 'traumatic brain injury' AND 'depression' and 6,458 for the combination 'epilepsy' AND 'depression'. It is therefore evident that attention to this topic is unsatisfactory despite not only the epidemiology of post-traumatic epilepsy but also the complex needs of people affected by this condition.

Research into this area has been rejuvenated during the last 10 years, especially regarding the management of traumatic brain injury, but this has only marginally improved the management of those who develop post-traumatic epilepsy.

Post-traumatic epilepsy is a complex condition requiring a multidisciplinary approach. Neurologists, neuropsychiatrists, neuropsychologists and specialists in rehabilitation medicine need to start working together and develop multidisciplinary coordinated clinical pathways to improve the care of people with post-traumatic epilepsy. This book intends to reflect these complexities, and for this reason it has brought together basic neuroscientists, neurologists, neurointensivists, neuropsychiatrists, neuropsychologists and specialists in rehabilitation medicine with either an epilepsy background or a traumatic brain injury background.

Chapter 1 is an overview of the basic neurobiological mechanisms behind the development of epilepsy after a brain injury. Chapter 2 reviews the epidemiology of post-traumatic epilepsy as well as current terminology in the light of the new International League Against Epilepsy (ILAE) definition of epilepsy and the difference between acute symptomatic seizures and late onset seizures. Chapters 3 and 4 cover the acute management of traumatic brain injury while the subsequent three chapters cover specific scenarios and subpopulations: post-traumatic epilepsy in children (Chapter 5), concussive convulsions during sport (Chapter 6) and traumatic brain injury during seizures (Chapter 7).

The subsequent four chapters are dedicated to the long-term cognitive and neuropsychiatric complications of traumatic brain injury and their potential role in post-traumatic epilepsy. Chapter 8 focuses on cognitive sequelae and rehabilitation strategies, and Chapter 9 on neuropsychiatric complications, while Chapter 10 discusses the relationship between traumatic brain injury and psychogenic non-epileptic seizures, a complex differential diagnosis and often coexisting problem in people with post-traumatic epilepsy. Chapter 11 focuses on the relationship between post-traumatic epilepsy and post-traumatic stress disorder.

Chapters 12 and 13 cover major problems connected to the pharmacological treatment of post-traumatic epilepsy: on the one hand seizure control and prevention, if possible,

during the acute phase (Chapter 12); on the other hand, the effect of antiseizure medications on cognitive functioning (Chapter 13).

Finally, Chapter 14 focuses on major problems in managing post-traumatic epilepsy in low income countries. Around 85% of the world's population lives in medium to low income countries, and this has always to be in our minds.

The aim of this book is to provide a starting point for clinicians and researchers to discover again this syndrome. I am grateful to my colleagues who have enthusiastically joined this project, for sharing their expertise. I hope that this book will contribute to providing better care to our patients as well as improving the quality of life of their families.

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July 2020