Book Review: Cannabinoids and Neuropsychiatric Disorders

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A Book Review on

Cannabinoids and Neuropsychiatric Disorders

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INTRODUCTION

Despite being quite well-studied, cannabis may be one of the most poorly understood compounds in molecular neuropsychiatry and pharmacology. This is partially due to the diverse behavioral effects of its constituent compounds themselves, the non-selective nature of the exogenous cannabinoids, and the legal hurdles affecting research outputs. The widespread use of marijuana for medical purposes (a complex mixture of over 400 chemical constituents found in widely varying quantities) rather than pure, isolated compounds also complicates the dissection of potential therapeutic applications. The book *"cannabinoids and neuropsychiatric disorders"* (Murillo-Rodriguez et al., 2021) provides an in-depth exploration of cannabis, its constituent molecules, and synthetic variants—as well as their effects on various psychiatric conditions. It provides the reader with a comprehensive introduction to the complex composition of *C. sativa* L. and our current understanding of the pharmacological actions of its constituent compounds (as well as the endogenous cannabinoids and synthetic products). It is a useful read for anyone with an interest in the psychopharmacology of medical cannabis, researchers, and healthcare practitioners alike.

SUMMARY

In the foreword to the book provided by R. Mechoulam, a critical problem of modern medicine's current stance on cannabinoids is highlighted: "medical cannabis," a complex mixture of many compounds (often in unknown quantities, and many of whose actions we do not fully understand), is reaching the public as a poorly understood yet widely available medicinal product. In order for medical cannabis to be appropriately incorporated into clinical practice, it is therefore key for healthcare practitioners to have sufficient grasp of what they are prescribing and how it can affect the various conditions encountered in their practice. This book provides a timely synthesis, with an in-depth characterization of the different classes of cannabinoids and their activities.

Overall, the book consists of nine chapters providing the reader with a global overview of the current state of our pharmacological understanding of cannabinoids and the relevance of these compounds to various psychiatric conditions for which cannabis has been prescribed or studied. Chapter 1 is dedicated to the different varieties of cannabinoids while also covering many of the other non-cannabinoid compounds identified in the cannabis plant (e.g., the terpenoids) that could

also possess their own therapeutic qualities. Chapters 2 and 3 then discuss the mechanisms believed to be responsible for the actions of cannabinoids. The first three chapters together provide an excellent overview of the cannabinoids and their activities. They also touch on the important and relatively recent discovery that many cannabinoids (both synthetic agonists and antagonists, as well as phytocannabinoids) can also act at novel orphan/recently deorphanized receptors (Begg et al., 2005; Ryberg et al., 2007; Huang et al., 2011; Brown et al., 2017) whose central distributions and functions we do not yet fully understand. Chapter 4 then discusses the clinical and pre-clinical evidence about the efficacy of cannabinoids garnered from clinical experimental models of both neuropsychiatric and non-neuropsychiatric conditions (with a particular emphasis on cancer, metabolic disorders/obesity, epilepsy, and neurodegenerative diseases).

The remaining chapters of the book then focus on the relevance of cannabinoids as interventions for various neuropsychiatric conditions. Chapters 5 through 8 contain an in-depth review of disorders for which cannabis has been the most well-studied—including depression [as well as its association with cannabis use disorder (CUD); Ch. 5], Alzheimer's disease (Ch. 6), Huntington's disease (Ch. 6), Parkinson's disease (Ch. 6), epilepsy (Ch. 7), and multiple sclerosis (Ch. 8). Finally, Chapter 9 concludes with a more general review of several additional disorders including anxiety disorders, schizophrenia, autism-spectrum disorders, attention-deficit hyperactivity disorder, and addiction (both in terms of CUD itself and of endocannabinoid-mediated modulation of the reward networks by other addictive substances). It also places a particular emphasis on what is known about modulation of the cannabinoid receptors in each condition.

EVALUATION

Overall, the book is clear, well-written, and provides an in-depth examination of the pharmacology of the cannabinoids that could be highly relevant for clinicians aiming to better understand products that their patients may be taking (either by prescription or outside of the guidance of healthcare practitioners) and the

effects these products may have on neuropsychiatric conditions. It is also highly relevant for researchers wishing to develop a better understanding of the chemical characterization of these compounds and their effects on behavior.

We do find one important limitation with the book, however. Although it provides in-depth coverage of several psychiatric conditions, a chapter on post-traumatic stress disorder (PTSD) and/or other Trauma- and Stressor-Related Disorders is notably absent. This is despite that cannabinoids have been used quite extensively in the treatment of PTSD (Jetly et al., 2015; Steenkamp et al., 2017; Veterans Affairs Canada, 2019). Among conditions treated by cannabis, PTSD is perhaps the one with the strongest theoretical basis to support its indication for the condition (Lisboa et al., 2010; Neumeister, 2013; Neumeister et al., 2013; Pietrzak et al., 2014). High rates of co-occurring CUD with PTSD have also indicated this as a key area of concern with regards to mental health comorbidities (Bryan et al., 2021). Thus, it is one of the primary conditions associated with cannabis use that clinicians will likely seek to better understand.

DISCUSSION

Overall, the editors and authors of this book have presented an excellent resource for readers interested in the endocannabinoid system and its role in neuropsychiatry. Its coverage of the complex cannabinoid pharmacology, the actions of the cannabinoid receptors, and its thorough review of the constituents of the cannabis plant and their effects on various psychiatric conditions make it a helpful reference. Given the current landscape of cannabis use and emerging potential therapeutic applications, ascertaining a greater understanding of the intricacies of the cannabinoids is an area of great importance, both for research and clinical practice—and this book offers a great summary of the current state of the literature.

AUTHOR CONTRIBUTIONS

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