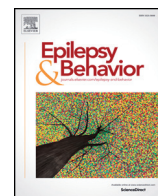




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Review

Third International Congress on Epilepsy, Brain and Mind: Part 1

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ABSTRACT

Epilepsy is both a disease of the brain and the mind. Here, we present the first of two papers with extended summaries of selected presentations of the Third International Congress on Epilepsy, Brain and Mind (April 3–5, 2014; Brno, Czech Republic). Epilepsy in history and the arts and its relationships with religion were discussed, as were overviews of epilepsy and relevant aspects of social cognition, handedness, accelerated forgetting and autobiographical amnesia, and large-scale brain networks.

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1. Introduction

The Third International Congress on Epilepsy, Brain and Mind (EBM3) took place in Brno, Czech Republic, on April 3–5, 2014. Being the third in a series of these biannual congresses, it maintained successfully the wide dimensions and high level of presentations and debate. While discussions about epilepsy and the brain, and specifically epilepsy as a brain disease, are the basis of all epilepsy congresses, during this and previous EBM congresses, we tried to look at issues within the triangle of epilepsy, brain, and mind.

There is no question today that epilepsy is a disease of the brain, rather than of the mind. Back in history, this has not always been clear, and it is interesting why for a long time it was thought, on the one hand, to be a disease of the body (rather than the head...), whereas oppositely, it was considered a disease of the mind, i.e., a mental disorder. Of course, this debate (which has been discussed in previous EBM meetings and again in EBM3) has been terminated by the clear-cut electrophysiological data, proving epilepsy to be a functional brain disease.

All scientists today accept that the brain is the organ of the mind, although differences exist along the monism–dualism spectrum. However, it is clearly beneficial and interesting to look at how the mind is affected by brain diseases, as exemplified by dementia, where the mind is being slowly eroded, or by Parkinson's disease, which is commonly accompanied by depression. By contrast, epilepsy is significantly much more heterogeneous in its mental manifestations, and unlike other diseases, here, the relationship is bidirectional. Not only do seizures cause mental aberrations, but the mind, in turn, can also induce psychogenic seizures during which we cannot see electrical discharges (though the movements constituting the episodes are triggered by the activity of some neurons, i.e., these neurons discharge electrically).

The mental affection in epilepsy relates, in many cases, to transient electric discharges. However, many mental phenomena are not brief but rather continue for prolonged periods of time, when current physiological techniques fail to show abnormal activity, especially paroxysmal abnormalities. The existence of such phenomena, manifested as mood changes or psychosis, are clearly a fertile ground for investigation of the brain and mind, and several aspects of these were investigated and discussed in the EBM3 congress as reflected by the extended abstracts which follow.

Across the time domain, we explored the history of our understanding. Along the cultural domain, we were impressed by the effect that epilepsy could have on artistic production, mainly in literature and music. Developmentally, we discussed the effects of antiepileptic drugs on cognition and behavior, as well as on electrical changes in the brain, some of which were recently explored for the first time.

The relationship of epilepsy with religious experiences has always attracted attention and is definitely an endless source of debates. It is perhaps not surprising that a “seizure” is interpreted by observers (and sometimes by patients themselves) as being of divine origin, leading at times to affected persons being crowned as leaders, such as Jeanne (Joan) d'Arc, but which may also confine such poor patients to mental asylums. Another interesting and unexplained aspect is the manifestation of hyperreligiosity which is well described in patients suffering from temporal lobe epilepsy.

Memory complaints are extremely common among persons with epilepsy, and can theoretically be due to brain damage, the epileptic activity itself, as well as the antiepileptic drugs. However, very frequently, the complaints are not fully corroborated by neuropsychological tests, leading to the important issue of metamemory, an understudied area in the field of epilepsy. In some cases, it may reflect the existence of depression, in others the limitation of the neuropsychological tests, but importantly may also be due to the way in which persons with epilepsy, as well as people in general, view themselves and their strengths and limitations. A better understanding of this complex and important field is clearly needed.

2. Epilepsy, history, and the arts

2.1. Epilepsy in Italian literature from Dante onward

Marco Mula

Since ancient times, epilepsy — the sacred disease — has been surrounded by an aura of mystery, superstition, and magic. Over the centuries, epilepsy has also been a frequently occurring neurological disorder due to lack of effective treatments, the high prevalence of traumatic brain injuries occurring from wars, and high rates of CNS infections and early birth problems. It is, therefore, plausible that many writers actually witnessed epileptic seizures, and these experiences may have been important sources of inspiration for their literary characters, whose features and stories may have been also influenced by common beliefs.

In the *Divine Comedy*, while relating the punishment of the thief Vanni Fucci in Canto 24 of the Hell, Dante described the paroxysmal features of an epileptic seizure, including the sudden changes in the physical aspects of the thief during the seizure and his gradual recovery from the attack, with postictal confusion and a deep sensation of fear and anguish. In this episode, the reference to epilepsy is quite clear as Dante uses the word “opillazio”. This word, from the Latin “opillatio”, was used only in the medical context and represented a type of obstruction of the pneuma caused by phlegma, which since the era of the Hippocratic Corpus was viewed as the main cause of epileptic seizures. It is also interesting that the character having a seizure is in hell and is a thief who stole something from a church. Some authors speculated that Dante himself might have had epilepsy [1], although there are no data supporting this hypothesis.

In “La storia”, Elsa Morante describes two characters with epilepsy, namely Ida and her son Usepe. Ida's disease is quite mysterious in the novel and nicely couples with her need to hide her Jewish origin during World War II in Nazi-occupied Italy. Her son, Usepe, is the result of Ida being raped by a Nazi soldier. Interestingly enough, Usepe's character is quite peculiar. He is sometimes considered a “special” child because of his ability to be in contact with nature. In this case, epilepsy is not totally surrounded by a negative aura, although it still remains magical and mysterious.

Between these two examples there are not only six centuries of history but also, importantly, Cesare Lombroso's theories. According to Lombroso, epilepsy, degeneration, and geniality shared a number of similarities, such as genetics, the tendency to commit suicide, religious fervor, and mental rambling [2]. The way epilepsy was perceived and described in literature definitely changed after Lombroso introduced his theories, thereby further establishing him as one of the most famous and at the same time controversial figures in the history of neuropsychiatry.

2.2. Epilepsy in popular music

Jerome Engel, Jr.

It was previously commented that, in contrast to creators of graphic art and literature, there appear to be no prominent classical composers with epilepsy. But this is not the case with popular music [3]. At this meeting two years ago, it was concluded that it was impossible to know what percentage of popular musicians might have epilepsy or the types of seizures they have or their causes, let alone the contribution of epilepsy to their music [3]. Furthermore, most popular musicians, including rap and hip-hop artists, are predominantly poets, so any contribution of epilepsy to their creative process would pertain as much to their literary output as to their musical compositions [3].

Perhaps the most famous popular musician with epilepsy is Neil Young, who has acknowledged his condition publicly and also mentioned it in his recent autobiography, *Waging Heavy Peace* [4]. He has not, however, commented on how his epilepsy might have influenced his enormous body of work, although particular songs such as *Helpless* and *She's Lost Control* would seem to reflect the predicament of

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