Social Cognition, Psychiatric Comorbidities and Quality of Life in Adults with Epilepsy

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Abstract

Deficits in social cognition are an increasingly recognised complication of epilepsy, and contribute to the deficits in social functioning and well-being experienced by patients with epilepsy. Although there has been an increase in studies exploring the measurement and biology of social cognition in patients in epilepsy, there are relatively few examining its clinical implications. Those studies that have been published highlight that social cognitive deficits contribute to impaired quality of life in patients with epilepsy, independent of other co-morbidities such as depression, anxiety, seizure frequency and impairment in other cognitive domains. This raises the possibility of novel therapeutic approaches to improving the social well-being of patients with epilepsy.

1.0 Introduction

Epilepsy is a disorder characterised not only by a predisposition to seizures, but also by neurobiological, cognitive, psychological and social co-morbidities [1]. In keeping with the recognition of the complexity of epilepsy, there has been an increase in clinical and research practice, in the measurement of the quality of life (QoL) of patients with epilepsy using a variety of surveys, scales and questionnaires [2]. The World Health Organisation (WHO) defines QoL as a broad-ranging concept affected in a complex way by a person's physical health, psychological state, level of independence, social relationships, personal beliefs and their relationship to salient features of their environment [3]. It does *not* simply equate to the absence of disease and infirmity, or in the case of patients with epilepsy, seizures. Subjective QoL assessments emphasise the patient's, rather than the physician's, perspective and are a multidimensional concept. These dimensions encompass three principal areas in patients with epilepsy. They are the physical (eg. frequency and severity of seizures, the side effects of medications), mental (eg. anxiety, depression, emotional well-being and cognition) and the social well-being of patients (eg. social activities, level of independence, perceived stigma and relationships with family and friends) [4]. This article will focus on how social well-being, and specifically social cognition, relates to co-morbidities and quality of life in patients with epilepsy.

2.0 Social Well-Being, Social Cognition and Epilepsy

Many studies examining the co-morbidities of epilepsy have concentrated on the social complications that arise as a result of having epilepsy [5]. They have found that patients with epilepsy have fewer social supports compared to individuals without the condition [6], are less likely to marry and have fewer children [7], have lower rates of

employment [8], and have less social engagement and less rewarding relationships [9]. Deficits in social well-being inevitably lead to difficulties in functioning in different societal roles, such as at work or at home as a member of a family, or community. This in turn gives rise to a reduced QoL [10–14], independent of mood [13] or seizure control [10], and difficulty in coping with the limitations of their condition [12].

In patients with epilepsy, deficiencies in social well-being may arise from a number of different reasons. They can be broadly split into three different, and yet interlinked, causes [9]. Psychologically, multiple factors can impair the development of skills needed for social interaction and engagement. These include the effects of parental overprotectiveness as a child, stigmatisation, reduced life experience opportunities, and fear of seizures [8,15,16]. From a psychiatric perspective the higher rates of depression and anxiety that are present in patients with epilepsy [2] can impact on the ability of patients to engage and function socially in a normal manner, and contribute to poor coping ability [17]. Finally, neurocognitive problems can also contribute to problems with social functioning. Impairments in attention, memory, language and processing speed, which are all common in patients with epilepsy, can contribute to social difficulties [8]. Patients may have difficulties in sustaining prolonged attention during conversations, or problems remembering previous interactions, names, or faces.

Impediments in non-verbal communication in particular can also contribute to problems with social cognition. Social cognition can be defined as the information processing that contributes to the correct perception and interpretation of the affective

and mental states, dispositions and intentions of another individual [18]. It is a broad-ranging term, and encompasses several cognitive processes. These include empathy, emotion regulation and recognition, prosody perception and higher cognitive functions such as Theory of Mind (ToM). ToM refers to the *inference* of emotional states (affective ToM), and intentions and beliefs (cognitive ToM) of others, as well as the prediction of their behaviour based on these mental states [18]. It is a prerequisite for employing appropriate, fluid and flexible social skills. These are typically automatic cognitive processes which act in parallel with other cognitive processes, and provide social information about others, in order to ensure smooth communication with other people in different situations [9]. At a biological level, social cognition depends on the efficient functioning of distributed brain networks, which include the medial frontal cortex, anterior cingulate cortex, temporo-parietal areas, temporal lobes, and amygdala [19]. All of these networks are regions, which are commonly affected in epilepsy, especially temporal lobe (TLE) and frontal lobe (FLE). There are numerous studies investigating the measurement and biological basis of deficiencies in social cognition in patients with epilepsy [20,21]. However, there are far fewer studies exploring the clinical ramifications and effect on QoL, of social cognition defects in patients with epilepsy. In the remainder of this article we will discuss the findings of those studies that have assessed the clinical impact of social cognition deficits, particularly on QoL.

3.0 Social Cognition and Quality of Life in Patients With Epilepsy

One of the complexities of studies assessing the clinical impact of social cognition deficits, is the difficulty in disentangling the contribution of social cognition from other epilepsy related co-morbidities to quality of life outcome measures. It is crucial,

therefore, in these studies to also measure cognitive function and assess mood and anxiety levels as well as seizure related variables. One of the earliest studies to assess the clinical impact of social cognition in patients with epilepsy, focused on how ToM or the capacity to understand mental states and understand interpersonal relations, related to cognitive self-evaluation, and the ability to cope with stressful events and overall QoL [22]. In this study, 54 patients with temporal lobe epilepsy (TLE) were compared to 12 with frontal lobe epilepsy (FLE) and 42 healthy controls. All participants completed the Faux Pas Task (FPT) in order to evaluate ToM. This requires the recognition or exclusion of social faux pas (FP) in 20 short stories. Participants also underwent a broad neurocognitive assessment to assess other cognitive domains including language, memory and executive functioning. Several self-report questionnaires were also completed. The Multiple Ability Self-report Questionnaire (MASQ) was used to explore the subjective perception of cognitive abilities in different domains, while the Coping Responses Inventory–Adult Form (CRI) was used to assess the types of coping responses to stressful life events. The World Health Organization QoL scale (WHOQoL) was used to assess overall QoL and encompasses several subdomains including physical and psychological well-being, level of independence, social relationships, environmental well-being and the influence on personal beliefs on life. Affective symptoms were assessed using the Beck Depression Inventory (BDI), and the State and Trait Anxiety Inventory (STAI). Variables were entered into regression models in order to assess their relationship with one another, and their unique contributions to outcome measures. The study found that both TLE and FLE patients had impaired ToM, and that these ToM deficits represented quite a specific pattern of impairment, distinct from other cognitive deficits. While FPT scores correlated with education, age of seizure onset, and disease

duration, only age of seizure onset predicted ToM performance. ToM performance also contributed to the variance of cognitive self-rating, suggesting that ToM adequacy is critical to a correct estimation of one's own functioning. This is perhaps not surprising given that ToM encompasses the idea that minds can have outlook on the world, and ToM tasks require an ability to distinguish between the mental representations held by others, and by the self. ToM also predicted coping, and the authors suggested that in patients with epilepsy, the understanding of others' mental states may contribute to adaptation, by helping patients to find adequate cognitive or behavioural coping strategies. ToM scores predicted overall QoL scores, and independence and environmental sub-scores. While anxiety and depression also predicted QoL scores, ToM made a contribution independent of these other factors. None of the cognitive scores, or demographic or clinical variables related to epilepsy contributed significantly to QoL outcome. This finding highlights, that the more efficient the understanding of other peoples minds and interactions, the better the perception of QoL, including feelings of belonging to a social group. Interestingly, in keeping with other previously published studies [23], there was no demonstrable association between affective symptoms and ToM, suggesting that mood and higher order cognitive functions involve separate neuronal networks.

Other, more recent, studies have replicated these findings [24]. In a study of 50 TLE patients and 50 controls, ToM was assessed using several tasks including the FPT. Cognitive functioning was assessed using the Montreal Cognitive Assessment (MoCA), and affective symptoms were indexed using the STAI and BDI. In addition disturbances of affective regulation, and empathy were also measured. QoL was measured using the Quality of Life Inventory in Epilepsy (QOLIE). The authors of this study reported that patients with TLE had reduced FPT scores, even after

correcting for differences in cognitive functioning, suggesting that ToM abilities can be distinguished from other cognitive functions. The duration of epilepsy, and empathy scores, were correlated with ToM impairment. Empathy is defined as one person's reaction to another person's experience, and is based on the ability to appreciate another person's perspective, and experience affective reactions to their experiences. Deficits in ToM and empathy may therefore interfere with a patient's ability to function normally socially. Although depression and anxiety scores were higher in patients than controls, they were not related to FPT scores. Importantly, social support, as measured by the QOLIE, was correlated with FPT scores.

4.0 Social Cognition and Social Functioning in Patients With Epilepsy

Only two studies have addressed the question of how social cognition specifically impacts on *social* functioning in patients with epilepsy [25,26]. The first study [25] investigated 67 patients with TLE and 30 healthy controls. It used several ToM tasks including the FPT. Participants were also cognitively evaluated, and their psychiatric status was measured using the Global Severity Index (GSI) as a measure of overall psychopathology, which was derived from the Symptom Checklist-90- Revised (SCL-90-R). Social functioning was assessed using the Social and Occupational Functioning Scale for Epilepsy (SOFSE), which is a functional-based measurement, and comprises 30 items in six dimensions: interpersonal relationships, communication, social engagement, leisure activities, instrumental living skill, and occupation. Again, regression models were used to assess the individual, unique contributions of the independent variables to the outcome variable or SODSE score(s).

The authors reported that patients with TLE showed impairments on ToM tasks. Regression analysis revealed that the FPT, GSI score of the SCL-90-R, and full scale IQ, which accounted for 38%, 11%, and 8% of the variance respectively, significantly predicted the SOFSE total score. Although both FPT and GSI scores had significant and independent predictive effects on SOFSE subscales, only FPR predicted all six sub-scale scores. The authors of this study, therefore, concluded that social cognition deficits, psychiatric disturbances, and impaired intellectual function are all relevant factors in predicting general social functioning in patients with TLE, but only social cognition deficits plays an important role in all aspects of social functioning. Social cognitive dysfunction may, therefore, affect a number of areas in patients with epilepsy including peer and family relationships, interpersonal communication, social activities, work/school behavior, and independent living skills. In doing so, it may limit the social opportunities to learn necessary and important skills. Interestingly, as with the previous study, the authors found no relationship between seizure-related clinical variables and social functioning.

A second study of over 500 epilepsy patients, tested the hypothesis that social stigma reported by patients with epilepsy is caused by ToM deficits [26]. Data was acquired remotely using online questionnaires. Feelings of stigma were measured using Jacoby's Stigma Scale, whilst the FPT were used to measure ToM. Despite the size of this study, the results were negative. Feelings of stigma had a negative, non-significant association with ToM performance. The authors suggested that part of the reason for this negative finding may be because there is a 'disconnection' between what patients report and experience meaning that patients with epilepsy may assume that they will be stigmatised and discriminated against, and therefore adopt coping strategies like social withdrawal which reinforce feelings of stigma.

5.0 Conclusions

Studies assessing social cognition in epilepsy and its clinical effects, including on quality of life, are limited. And yet, the evidence to date suggests that social cognition deficits make a unique contribution to impaired quality of life and social functioning in patients with epilepsy, independent of other co-morbidities such as cognitive deficits, affective symptoms and seizure related variables. This is an important finding that needs to be replicated in larger studies. If these findings bear scrutiny, social cognition deficits potentially present themselves as a novel therapeutic target with real world benefits for patients with epilepsy.

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