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Epilepsy and Psychosis - A Myth - Revealing the Facts about this Potential Vicious Cycle of Overlapping Territories with Reciprocal Relationship Which is Potentially or, Reversible and Possibility of Breakthrough - If Either of the Other Could be Stopped and Would a Dream Comes True in Reality for these Unfortunate People for The Challenges Faced by Them: Clinical Study in a Tertiary Center

Epilepsy and Psychosis: Debunking the Myth - Unveiling the Reality of their Interconnectedness

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Abstract: ***Background: the interplay between epilepsy and psychosis exemplifies a reciprocal relationship, where our comprehension of the brain is elucidated through its psychological manifestations, encompassing behavior and cognition. Conversely, insights into behavior and cognition offer valuable understanding of brain function. This bidirectional exchange forms the fundamental premise of neuropsychology, emphasizing how disturbances within the brain can yield predictable effects on its functions and outputs. Furthermore, the intricate connection between disrupted cognition, behavior, and brain function underscores the clinical significance of neuropsychology, even in its most scholarly pursuits. Notably, the pioneers of neuropsychology were predominantly clinicians whose expertise closely mirrored that of contemporary neuropsychiatrists, highlighting the clinical roots of this interdisciplinary field. Aim and Objective of the Study: Our study aimed to delineate between psychosis and epilepsy with psychiatric symptoms, facilitating prompt diagnosis for early interventions and improved patient outcomes. Investigating the neuropsychological states and their association with seizures or seizure - related psychological features was the primary focus of our inquiry. Methodology: Conducted as a prospective cross - sectional study over three years, our research involved a sample of 2000 patients from the Departments of Neurology and Psychiatry in Tirunelveli. By analyzing patient data and clinical presentations, we sought to identify patterns and correlations between epilepsy, psychosis, and associated neuropsychological states. Conclusion: Our findings revealed that approximately 33% of patients presented with epileptic psychoses, encompassing pre - ictal, ictal, and post - ictal manifestations. The multifaceted nature of epilepsy underscores its relevance to both psychiatry and neurology, with some aspects bridging the gap between these disciplines. Seizures can manifest in various forms, from classic motor convulsions to complex behavioral and subjective experiences, highlighting the complexity of their neurological and psychological implications.***

Keywords: epilepsy, psychosis, neuropsychology, seizures, diagnosis

1. Introduction

The genesis of this study and the endeavor to craft an article on epilepsy and psychosis stem largely from clinical observations and educational pursuits. Both realms underscore the dearth of focused understanding regarding the overlapping domains of psychiatry and neurology – a deficiency evident in the scantiness of scholarly literature addressing this subject matter. Undoubtedly, akin to any borderland, there exists a risk of relative neglect as each distinct discipline advances along its specialized trajectory, leaving, inevitably, a somewhat uneasy intersection between them.

Epilepsy, deriving from the Greek "epilepsia" meaning "taking hold" or "seizing, " profoundly disrupts one's daily existence, often inducing tragic transformations, particularly when intertwined with psychiatric symptoms. Individuals grappling with this condition may lose their livelihoods, social standing, and even familial ties, sometimes finding themselves abandoned to the streets by overwhelmed caregivers or relatives. However, for those whose psychiatric symptoms stem from treatable organic origins, a return to normalcy and socio - occupational productivity is conceivable. Yet, diagnosing conditions such as psychogenic non - epileptic seizures (PNES) presents a formidable challenge, distinct from other differentials like syncope.

The privilege of witnessing the remarkable growth of interest and advancement in this subspecialty has been profound. Presentations of epilepsy may manifest with alterations in personality, affective disturbances, neurotic symptoms, or even clinical pictures suggestive of schizophrenia. Clinicians must remain vigilant, recognizing that mental illnesses presenting in such manners may occasionally signal the early stages of cerebral disease or seizures. Associated disorders may encompass cognitive impairments, personality deviations, or various types and durations of psychotic illnesses. The study of epilepsy patients has significantly contributed to advancing our understanding of both brain function and dysfunction, shedding light on the pathophysiological underpinnings of certain psychological disorders.

Epileptology, emerging as a distinct specialty within neurology, holds promise for individuals grappling with psychiatric symptoms if they are linked to temporal lobe seizures or secondary psychosis due to epilepsy, particularly if the focus can be effectively managed through epilepsy surgery. The behavioral descriptions before, during, or after seizure episodes, along with interictal psychosis, further underscore the multifaceted nature of epilepsy - related psychiatric manifestations. The primary focus of this article lies in elucidating those aspects most pertinent to the psychiatrist's practice. While it is evident that the majority of epilepsy patients experience minimal or no mental disturbances, those who do present complex and challenging clinical scenarios.

The integration of external and internal sensations with emotions and moods culminates in the ultimate sense of self - awareness, or "I am. " Consequently, the disintegration of this intricate organization, while retaining sensation, often precipitates the myriad disturbances of self encountered by temporal lobe epilepsy patients. Fenton's proposed classification system for psychiatric disorders in epilepsy, widely adopted, provides a structured framework for understanding the varied presentations and their nuance

BRIEF PSYCHOSIS
A. ICTUS RELATED STATES
1. Pre - ictal status
2. Minor status Petit - mal status Psychomotor status
3. Post - ictal confusion
4. Post - ictal psychosis
5. Other states
Twilight states
Fugue states
B. **UNRELATED TO SEIZURE ACTIVITY**
1. Alternating psychosis
2. Sub - ictal psychosis
CHRONIC INTERICTAL PSYCHOSIS
1. SCHIZOPHRENIA
2. PARANOID
3. MANIC DEPRESSIVE

Terms Describing Automatisms

	Lip - smacking, lip - pursing, chewing, licking, tooth grinding or swallowing
Gestural (often unilateral)	Fumbling or exploratory movements with the hand directed toward self or environment Movements resembling those intended to lend emotional tone to speech
Hyperkinetic	Involves predominantly proximal limb and axial muscles producing irregular sequential ballistic movements such as pedalling, pelvic thrusting, thrashing, rocking movements
Mimetic	Facial expression suggesting an emotional state, often fear
Manual or pedal	Indicates principally distal components, bilateral or unilateral Fumbling, tapping, manipulating movements
Spontaneous	Stereotyped, involve only self, virtually independent of environmental influences Interactive Not stereotyped, involve more than self, environmentally influenced
Interactive	Not stereotyped, involve more than self, environmentally influenced
Hypokinetic	Decrease in amplitude and/or rate or arrest of ongoing motor activity
Gelastic	Bursts of laughter or giggling, usually without an appropriate affective tone
Dysphasic	Impairment of language without dysfunction of relevant primary motor or sensory pathways, manifested as impaired comprehension, anomia, paraphasic errors or a combination of these
Dyscrastic	Bursts of crying
Vocal	Single or repetitive utterances consisting of sounds such as grunts or shrieks
Verbal	Single or repetitive utterances consisting of words, phrases or brief sentencses

Aim and Objective of the Study

The primary aim of this study is to delineate between psychosis and epilepsy, particularly when psychiatric manifestations are intertwined with epileptic episodes. Given the intricate interplay of psychosocial and organic factors in causation, there is a pressing need to streamline the assessment process to ensure thoroughness while mitigating complexity and time consumption.

Specific objectives include:

1) Early identification of peri - ictal psychosis to facilitate prompt intervention and potential reversibility, thereby mitigating the stigma associated with psychiatric symptoms in epileptic patients.
2) Discrimination between psychosis exacerbated by epilepsy and other forms of psychosis, enabling tailored therapeutic approaches.
3) Identification of distinct types of epilepsy presenting with behavioral disturbances resembling psychosis.
4) Reduction of morbidity, mortality, and psychosis - related burden through timely diagnosis and effective interventions.
5) Identification and remediation of comorbid conditions such as depression, bipolar disorder, anxiety, cognitive impairment, and destructive behaviors including criminality and interictal violence, alongside the focal point of our study, psychosis.

Study Design: Prospective Cross - Sectional Study

Study Period: Years 2021 – 2024

2. Methodology

The study included patients visiting the neurology and psychiatry outpatient departments presenting with a history of epilepsy accompanied by additional psychiatric symptoms. These symptoms were categorized as peri - ictal (occurring around the time of a seizure) or inter - ictal (occurring between seizures). Peri - ictal symptoms were further classified into pre - ictal (before a seizure), ictal (during a seizure), and post - ictal (after a seizure). Various parameters such as symptom onset, duration, remission, and recurrence were meticulously recorded.

Psychiatric manifestations were observed to emerge sometimes after a lucid interval of hours or days following a seizure. A total of 2000 epilepsy patients were screened for psychiatric symptoms following initial epilepsy investigations. Among them, 40% of outpatients and 35% of inpatients were diagnosed with dissociative motor convulsions. Patients with dissociative motor convulsions were excluded from the study, while the remaining epileptic patients were further evaluated for peri - ictal psychosis and organic psychosis.

Inclusion Criteria:
- Epileptic patients aged 5 to 50 years.
- Patients receiving either monotherapy or polydrug therapy.

Exclusion Criteria:
- Patients with learning disabilities and autism were excluded from the study.

DIAGNOSTIC CRITERIA FOR POSTICTAL PSYCHOSIS (Logsdail and Toone):
1) Onset of psychosis, often accompanied by confusion and delirium, within 1 week of a seizure.
2) Duration of psychosis lasting at least 15 hours but less than 2 months.
3) Presence of delirium, delusions, or hallucinations in clear consciousness.
4) Absence of evidence of recent antipsychotic medication use, antiepileptic drug activity, nonconvulsive status on EEG, recent head trauma, or alcohol/drug intoxication or withdrawal within the past 3 months.

Basic investigations were conducted to rule out underlying systemic illnesses, with cardiac evaluations performed as needed. Neuroimaging was employed to identify any structural abnormalities, and a comprehensive history, including personal, family, and drug intake, was obtained. EEG was performed for all cases to aid in diagnosis.

3. Results

A cohort of 2000 epileptic patients attending the neuromedicine OPD and inpatient facilities underwent thorough examination. The study encompassed a spectrum of manifestations including hallucinations—both visual and auditory—agitation, fear, déjà vu, jamais vu, self - obsession, muttering, and paranoid features. Among these patients, 11% presented with chronic psychiatric issues, while 30% exhibited episodic problems. The remaining individuals displayed a range of variable presentations.

For instance, depression was prevalent in 10% of patients reporting fewer than one seizure per month, while its prevalence rose to 21% among those experiencing seizures more frequently. Similarly, other psychiatric manifestations showed an increased incidence with poor seizure control. Repeatedly, investigations into the relationship between epilepsy and various psychiatric conditions have highlighted seizure severity as a significant risk factor, with psychiatric disorders being disproportionately represented among those with chronic, intractable epilepsy. Importantly, these patients demonstrated positive responses to treatment with antiepileptic drugs and neuroleptics.

Epilepsy remains a domain often misunderstood by those outside its realm, particularly due to its manifestations that can mimic non - epileptic dissociative seizures. The onset of seizures within the medial temporal lobe structures initially leads to subtle mood changes. However, as the emotional intensity escalates into fear, accompanied by autonomic and behavioral features, EEG abnormalities spread to frontal regions. This progression suggests the involvement of a distributed limbic network, encompassing the medial temporal lobe, orbito - prefrontal cortex, and anterior cingulate.

Cognitive aberrations associated with temporal lobe seizures include disruptions in speech, memory, and thought processes. Vocalization occurs in approximately half of temporal lobe seizures, often as non - verbal utterances associated with either dominant or non - dominant foci. Speech automatisms, characterized by recurrent, irrelevant, or emotionally toned speech, are strongly linked to non - dominant temporal lobe focus.

Memory disturbances, ranging from difficulty with recall to compulsive reminiscence, are common, along with alterations in recognition leading to sensations of déjà vu and jamais vu. Some patients experience prescience, a profound sense of knowing future events, or panoramic memory, where entire past episodes are relived in a brief period. Distortions in time perception are integral to the aura experience, with time appearing to rush by or stand still.

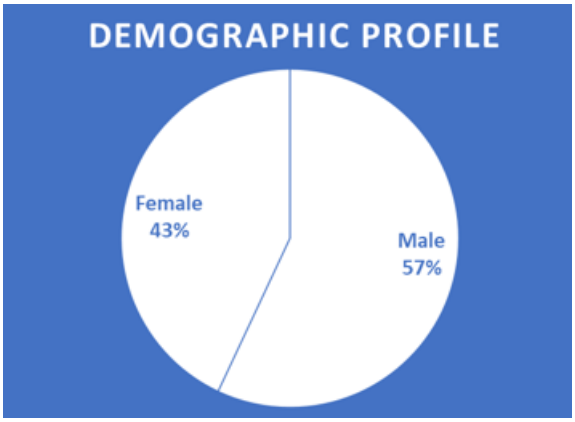
Various perceptual anomalies accompany temporal lobe seizures, including illusions and hallucinations. Gustatory and olfactory hallucinations, emanating from medial temporal lobe structures, are significant for diagnosing temporal lobe epilepsy (TLE). Auditory hallucinations range from buzzing noises to organized experiences such as music or voices, while visual illusions encompass distortions in object size, shape, and color perception. Complex visual hallucinations often involve scenes, faces, or past experiences, sometimes overlapping with dysmnestic phenomena like déjà vu.

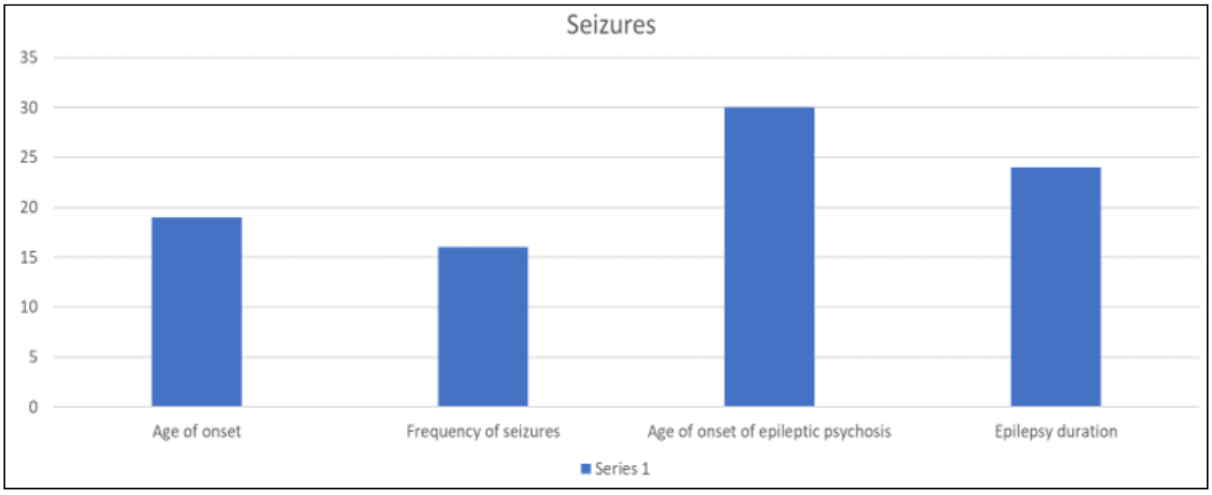
The emotional quality of perceptual experiences may alter abruptly, with objects, sounds, or events acquiring vivid significance or the patient feeling detached from the

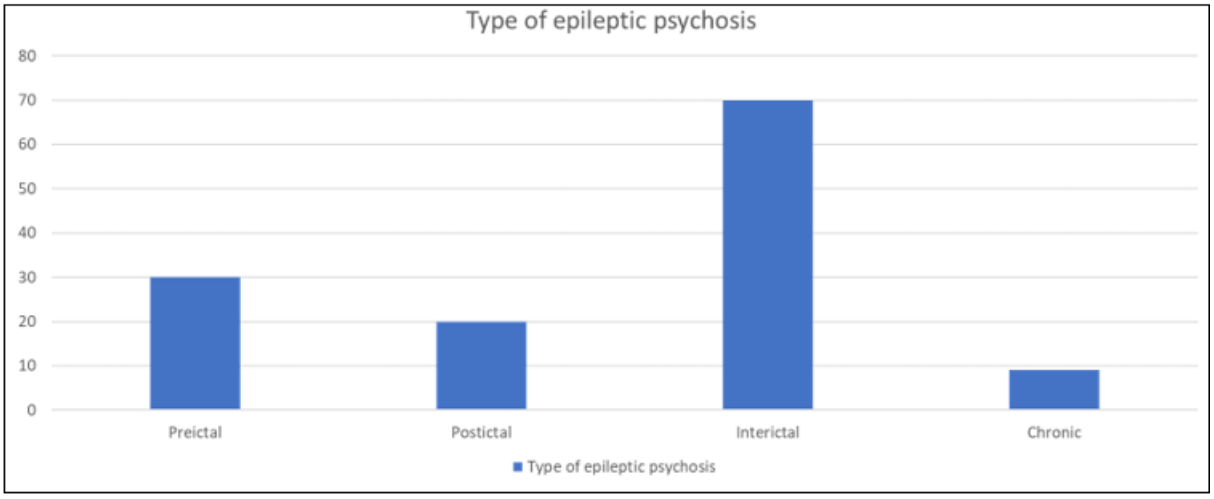
environment, experiencing derealization or depersonalization. The combination of these aura aspects often follows a characteristic march, transitioning between sensations like epigastric sensations, gustatory hallucinations, or intense déjà vu. These diverse experiences, sometimes occurring simultaneously, can be challenging to articulate due to their richness and strangeness, often involving disturbances in reality perception and self - awareness.

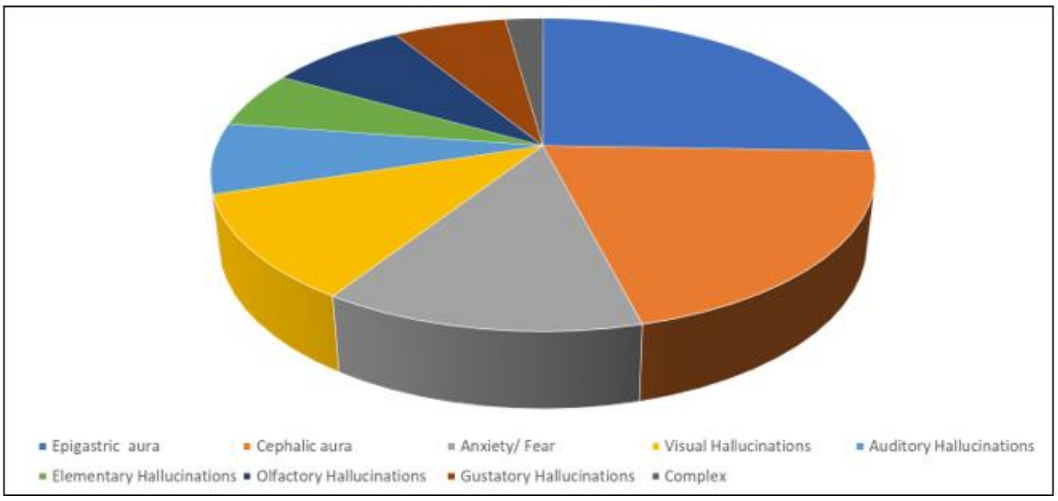
Autosomal dominant nocturnal frontal lobe epilepsy is a rare but distinctive disorder characterised by autosomal dominant inheritance with high penetrance and frequent nocturnal frontal seizures with complex hyperkinetic behavioural automatisms. Frontal lobe seizures tend to begin and end abruptly, are brief (usually less than 1 minute in duration), often frequent, and show a tendency to occur at night and in clusters. Motor phenomena, which may include complex posturing and behavioural automatisms, are usually the most conspicuous feature. Affective experiences represent a prominent aspect of approximately one - quarter of temporal lobe auras. Among these, anxiety stands out as the most prevalent, often manifesting as intense ictal fear that surges suddenly without any apparent trigger. Additionally, other unpleasant affects such as depression, guilt, and on rare occasions, anger, and even violence may occur.

Pleasant Affects: In contrast, pleasurable affects like joy, elation, or ecstasy are less frequently reported (Stefan et al., 2004). Ictal emotional experiences are characterized by their intensity and often possess a unique quality, difficult to articulate, which sets them apart from ordinary emotions. These experiences tend to be stereotyped and simplistic, lacking the nuanced nature of typical emotions. Importantly, affective auras are an intrinsic component of the seizure itself, rather than a secondary reaction to another aspect of the aura. Despite this, the emotional content of the aura may influence hallucinatory experiences or occasionally lead to disturbed behavior.









4. Discussion

Researchers, such as Biraben et al. (2001), have highlighted the behavioral manifestations associated with intense ictal fear, which can include calls for help, marked agitation, or frozen immobility out of fear. Furthermore, there is evidence suggesting a correlation between ictal fear and non - dominant medial temporal foci. Some studies say that there is no temporal relationship between interictal and chronic psychosis with epileptic seizures which contradicts with our study. There is a different type of epileptic psychosis associated with AED s. In a study conducted at the Columbia comprehensive epilepsy center with newer AED s there was significantly fewer PSE to gabapentin {n - 60, 0.6 % incidence. P<.001. Lamotrigine n=547, 4.8% incidence P<.001and significantly more PSE for levetiracetam. n=521, 5.7%, incidence P<.001 & 8.8% discontinued levetiracetam due to the side effects - PSE. Vigabatrin, felbamate and oxcarbamazepin were associated with low rates of PSE. Psychiatric h/o was the most significant nondrug predictor of AED related PSE.

In patients experiencing complex partial seizures, the distribution of aura types is as follows:

- Epigastric aura: 35%
- Cephalic aura: 28%
- Anxiety/fear: 18%
- Hallucinations/illusions:
- Visual: 15%
- Elementary: 4%
- Complex: 2%
- Auditory: 10%
- Elementary: 8%
- Complex: 3%
- Olfactory: 11%
- Gustatory: 9%
- Somatosensory: 15%
- Dysmnesic/déjà vu: 8%
- No aura: 10–51%, although uncommon occurrences may still arise.

Clinical features of temporal lobe seizures with lateralising value.

Lateralising value	Semiological feature
Ipsilateral	1. Unilateral gestural automatisms 2. Postictal nose rubbing
Contralateral	1. Dystonic posturing 2. Late versive movement (preceding secondary generalisation) 3. Unilateral clonic activity (uncommon 4. Todd's paresis (uncommon)
Dominant hemisphere	Postictal dysphasia
Non - dominant hemisphere	Ictal speech

The classification of temporal lobe epilepsy (TLE) auras holds limited lateralizing value, except for instances of ictal fear, which may suggest a focus in the non - dominant hemisphere. Over time, the specific content of these auras can change, and reviewing past patient notes may reveal documented phenomena that the patient no longer recalls. This can sometimes lead to a risk of misdiagnosis as a psychogenic disorder.

The anatomical classification of epileptic syndromes is only approximate, with considerable overlap between them. Among frontal lobe seizures, those involving complex behavioral automatisms are often the most bizarre. When localized in the orbitofrontal cortex, they are commonly referred to as hypermotor seizures, reflecting their characteristic features. These seizures typically commence abruptly, often accompanied by intense grimacing indicative of overwhelming emotions. Although patients do not usually describe ictal fear, they exhibit complex behavioral automatisms, often frantic and bilateral, sometimes involving overtly sexual movements. These may include pedalling, thrashing, kicking, and vigorous clapping or finger - clicking, sometimes to the extent that patients appear to thrust themselves out of bed.

In our study, the prevalence of psychoses in epilepsy was found to be 8%. Specifically, the prevalence of psychosis in TLE was 13%, with interictal psychoses at 6% and postictal

psychoses at 3%. These findings align somewhat with a meta - analytic study published in BMC Psychiatry on March 13th, 2014, conducted in Manchester. However, a study on the pharmacological treatment of psychoses in epilepsy contradicts our findings, reporting a higher prevalence of postictal psychoses at 25%, interictal psychoses at 9%, and ictal psychoses at 30%, as published in scielo Brazil.

5. Conclusion

In dispelling the myth unveiling the complex relationship between neurological and psychiatric conditions which is a spectrum can be reversible in the sense that changes in personality are related to the interaction between the hippocampus and the amygdala and patients with temporal lobe epilepsy present with a higher frequency of schizophrenia like illness. Hence type of epilepsy syndrome, treatment response, patient psychosocial conditions affects the patients probability of presenting with psychosis. Adequate remissions, avoiding drugs that induce psychosis can partly reverse the psychosis+

In conclusion, numerous case - control studies have examined the prevalence of psychiatric disorders in epilepsy compared to other patient groups. While epilepsy has been consistently associated with higher rates of psychiatric morbidity such as depression and chronic psychosis, the differences observed have not always been striking. It appears that the chronic disability associated with intractable epilepsy plays a significant role in determining psychiatric sequelae. Studies, including that by Mendez et al. (1986), underscore the complex interplay between epilepsy and psychiatric conditions, highlighting the need for comprehensive management strategies addressing both neurological and psychological aspects to improve patient outcomes and reduce the risk of adverse psychiatric outcomes, including suicide.

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