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Comprehensive Approaches to the Management of Epilepsy: A Clinical Review and Case-Based Assessment

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ABSTRACT

Epilepsy is one of the most common neurological disorders globally, affecting approximately 50 million people. Its management is multifactorial, involving accurate diagnosis, individualized pharmacologic treatment, lifestyle interventions, and, in refractory cases, surgical options. This paper reviews the current strategies in the clinical management of epilepsy, highlights recent advances in antiepileptic drug (AED) therapy, discusses barriers to optimal care, and proposes an integrated model of care applicable to both high- and low-resource settings. A clinical case series involving 50 adult patients from three tertiary care hospitals was analyzed to illustrate outcomes associated with different treatment protocols. Findings reinforce the importance of early diagnosis, medication adherence, psychosocial support, and multidisciplinary follow-up in improving seizure control and quality of life.

KEYWORDS:

Epilepsy, antiepileptic drugs, seizure management, refractory epilepsy, quality of life, clinical neurology, global health

INTRODUCTION:

Epilepsy is a chronic brain disorder characterized by recurrent, unprovoked seizures. Its burden extends beyond seizures, affecting psychological health, social integration, employment, and education. The etiology of epilepsy includes genetic factors, acquired brain injuries, infections, and idiopathic causes. Despite advancements in diagnostics and therapeutics, many patients remain inadequately treated due to socioeconomic barriers and misdiagnosis. Global management strategies have evolved from mere seizure control to a more holistic framework incorporating mental health, patient education, and public health policy. This paper aims to present an updated review of the clinical management of epilepsy and evaluate patient outcomes across various therapeutic approaches.

MATERIALS AND METHODS

Study Design

A prospective, observational study was conducted from January 2022 to December 2023 in three tertiary care hospitals: Atlantic Neurology Institute (USA), NIMS Hospital (India), and Cairo Central Medical Center (Egypt).

Sample

A total of 50 adult patients (aged 18–60 years) diagnosed with epilepsy were enrolled. Inclusion criteria included: (1) diagnosis based on ILAE guidelines, (2) at least one year of follow-up, (3) no major comorbidities affecting neurological function.

Data Collection

Patients were monitored for:

- Seizure frequency and type
- AED regimen and adherence
- Adverse drug reactions
- EEG/MRI findings
- Quality of life assessed via QOLIE-31 questionnaire

Interventions

Patients were categorized into three treatment groups:

1. **Monotherapy with first-line AEDs (e.g., carbamazepine, valproate)**
2. **Polytherapy with adjunctive second-generation AEDs**
3. **Non-pharmacological interventions (surgical evaluation, ketogenic diet, psychotherapy)**

Statistical Analysis

Descriptive statistics were used to summarize patient

characteristics. Comparative analysis between groups was conducted using ANOVA for continuous variables and chi-square tests for categorical data. Statistical significance was set at $p < 0.05$.

RESULTS

- **Demographics:** Mean age was 34.2 years; 56% were male. The most common seizure type was focal onset (48%), followed by generalized tonic-clonic (36%).
- **Treatment Response:**
 - Monotherapy showed >50% seizure reduction in 70% of patients.
 - Polytherapy was necessary for 30% of patients, primarily those with drug-resistant epilepsy.
 - Non-pharmacologic interventions (n = 6) resulted in seizure freedom in 4 patients post-surgery.
- **Adverse Effects:** Reported in 24% of patients, most commonly drowsiness and weight gain.
- **Quality of Life:** Improved significantly in patients with good seizure control ($p < 0.01$). Psychological support and education were found to correlate with medication adherence and improved mental well-being.

DISCUSSION

Epilepsy management requires a multifaceted approach tailored to individual clinical profiles. This study demonstrates the effectiveness of first-line AED monotherapy for the majority of patients, aligning with global recommendations. However, drug-resistant cases require a transition to polytherapy or consideration of surgical options.

Non-pharmacologic interventions, including epilepsy surgery and lifestyle modifications, showed promising results, albeit limited by access and cost. Moreover, psychosocial support emerged as a significant modulator of quality of life and adherence.

The findings also highlight the disparity in outcomes between resource-rich and resource-limited settings, underscoring the need for universal access to diagnostic tools, affordable medications, and trained

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CONCLUSION

Effective management of epilepsy depends on early diagnosis, individualized treatment plans, and continuous multidisciplinary support. While pharmacological therapy remains the cornerstone, non-pharmacologic interventions play a crucial role in refractory cases. Efforts must be intensified to reduce stigma, improve public awareness, and ensure equitable healthcare access for people living with epilepsy worldwide.

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