The Incidence and Predictors of Recurrence after First Seizure in Emergency Department and Outcomes: A Retrospective Study in A University Hospital

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**Background:** The risk factors of seizure recurrence after first seizure have been generally studied. However, the risks and outcomes among adults and elderly attending emergency services have been scarcely reported.

**Objective:** This study aimed to demonstrate risk factors of seizure recurrence after the first seizure presenting to emergency department (ED) among adults and elderly patients, as well as their final outcomes.

**Methods:** This was a retrospective cohort study. Patients presented with first seizure at ED were recruited between January 2003 and December 2016. Final seizure outcomes were evaluated by Glasgow outcome scale (1-3 unfavorable; 4-5 favorable). Risk factors associated with seizure recurrence and final outcomes were assessed using Cox’s proportional hazard analysis and multiple logistic regression.

**Results:** A total of 414 patients were recruited. They comprised of 267 adults (aged 16-64 years) and 147 elderly (aged ≥65 years) presented to ED with first seizure. The incidence of recurrent seizure at 6 months, 1 year, and 2 years were 0.63 (95% CI 0.54-0.71), 0.76 (95% CI 0.67-0.83), and 0.94 (95% CI 0.88-0.97), respectively. Independent predictors of seizure recurrence were remote symptomatic etiology (adjusted HR = 2.21, 95% CI 1.38-3.55) and nocturnal seizure onset (adjusted HR = 1.53, 95% CI 1.03-2.26). Factors predicted unfavorable final outcome were remote symptomatic etiology (OR 2.34, 95% CI 1.25-4.37) and age ≥65 years (OR 4.35, 95% CI 2.42-7.83). The antiepileptic drug (AED) treatment was associated with unfavorable outcome.

**Conclusion:** Remote symptomatic etiology has significant association with seizure recurrence and poor outcome. However, advanced age is merely correlated to poor outcomes. The unfavorable outcomes of AED treated group might be related to presenting clinical severity. Therefore, decision for starting AEDs in patients with first seizure should be based on the risk of seizure recurrence and the final outcomes.

**Keywords:** First seizure, Adult, Recurrent seizure, Factor, Predictor