EFFECT OF EARLY ELECTROENCEPHALOGRAM CHANGES ON MORBIDITY AND MORTALITY IN CRITICALLY ILL PATIENTS WITH SEPSIS RELATED ENCEPHALOPATHY

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Introduction

Sepsis-associated encephalopathy (SAE) refers to multifactorial syndrome manifested by diffuse cerebral dysfunction promoted by systemic responses to infections with no clinical or lab evidence of directly cerebral infections or other forms of encephalopathy. The electroencephalogram (EEG) is one of the methods that allow physicians to continuously monitor the brain and help management decision. EEG abnormalities observed in septic patients may reflect these neurotoxic processes. Characteristic EEG patterns during sepsis include lack of reactivity, excessive theta and delta activity, electrographic seizure, and periodic discharges.

Aim of the work

Our study aimed to assess early EEG changes in patients admitted to ICU with SAE and its correlation with morbidity and mortality.

Patients and Methods

Eighty patients suffering from sepsis or septic shock were subjected to EEG recording to detect the role of EEG changes in predicting morbidity and mortality.

Results

Table 1: Relation between EEG grading of admission with 7-day Mortality in total patients (n = 80)

	No.	EEG grading		U	p
		Mean ± SD.	Median (Min. – Max.)		
7-day Mortality					
Survivors	74	2.42 ± 1.40	2.0 (0.0 –5.0)	74.00*	0.006*
Non-Survivors	6	4.17 ± 0.98	4.50 (3.0 –5.0)		

SD: **Standard deviation**   U: **Mann Whitney test**
p: p value for Relation between EEG after 72 hrs. of admission with 7-day Mortality
*: Statistically significant at p ≤ 0.05

Table 2: Prognostic performance for EEG grading to predict mortality (n = 32 vs. 48)

	AUC	p	95% C. I	Cut off	Sensitivity	Specificity	PPV	NPV	Accuracy
EEG grading	0.887	<0.001*	0.808 – 0.965	>2#	87.50	81.25	75.7	90.7	83.75

AUC: Area Under a Curve   p value: Probability value CI: Confidence Intervals
NPV: Negative predictive value   PPV: Positive predictive value
*: Statistically significant at p ≤ 0.05   #Cut off was choose according to Youden index
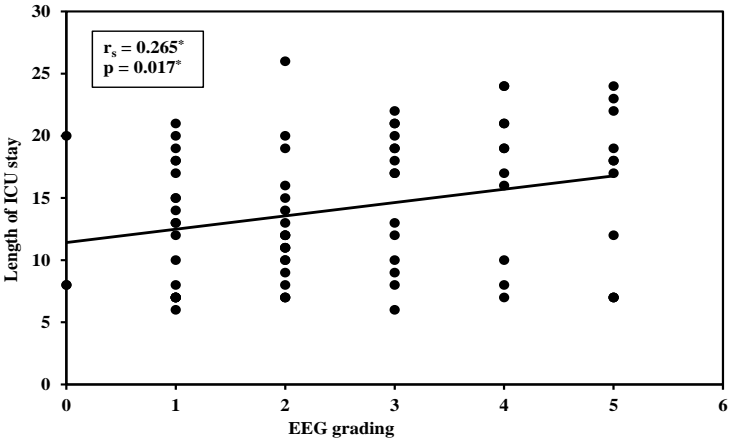

Figure 1: Correlation between EEG grading with length of ICU stay in total patients
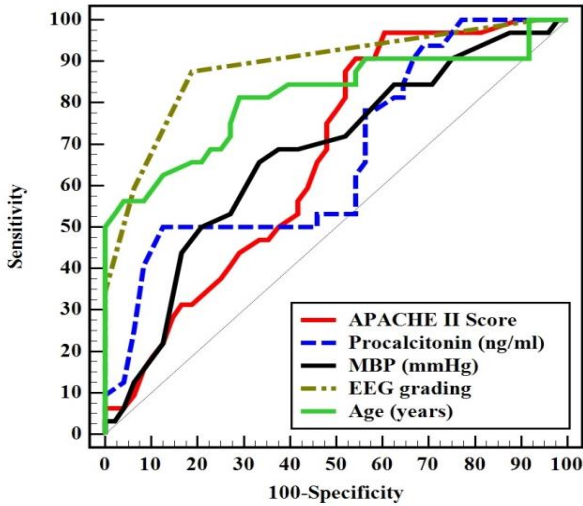

Figure 2: ROC curve for different parameters to predict 28-day Mortality (n = 32 vs. 48)

Conclusion

EEG has the highest sensitivity and accuracy to predict 28-day mortality in sepsis and septic shock patients with SAE and can be used as univariate parameter in predicting mortality