Assessing Risk for Relapse Among Children with Infantile Spasms Using the Based Score After ACTH treatment: A Retrospective Study

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Supplementary Materials

The supplementary materials include the following figures and tables: Figure S1, ...

**Table S1.** Cox regression analysis of relapse risk factors in children with infantile spasms (72 cases) who achieved short-term response.

**Model 1: Univariate cox regression analysis.**

| Factor                                      | HR  | 95% Confidence interval for hazard ratio | P    |
|---------------------------------------------|-----|----------------------------------------|------|
| Gender (Male/Female)                        | 0.73| 0.37 - 1.46                            | 0.38 |
| Presence of hypsarrhythmia before ACTH treatment | 0.54| 0.26 - 1.15                            | 0.11 |
| Pathogenic structural abnormalities on MRI  | 0.85| 0.39 - 1.85                            | 0.68 |
| Definitive etiology                         | 1.5 | 0.78 - 2.86                            | 0.22 |
| Number of ASMs                              | 1.47| 0.93 - 2.31                            | 0.098|
| VPA exposure history                        | 2.18| 1.14 - 4.17                            | 0.018|
| TPM exposure history                        | 0.84| 0.3 - 2.38                             | 0.75 |
| VGB exposure history                        | 0.46| 0.06 - 3.33                            | 0.44 |
| Hormonal therapy history                    | 1.09| 0.43 - 2.81                            | 0.85 |
| Presence of hypsarrhythmia after ACTH treatment | 3.09| 1.27 - 7.53                            | 0.013|
| Interval from onset to receive ACTH treatment | 1.1 | 1.01 - 1.2                             | 0.026|
| Age at spasms onset                         | 0.39| 0.99 - 1                               | 1.04 |
| Frequency of spasms                         | 1   | 0.99 - 1                               | 0.39 |
| Dosage of ACTH                              | 0.76| 0.35 - 1.68                            | 0.5  |
| BASED score                                 | 1.54| 1.27 - 1.88                            | <0.001|

**Model 2: Multivariate cox regression analysis**

| Factor                                      | HR  | 95% Confidence interval for hazard ratio | P    |
|---------------------------------------------|-----|----------------------------------------|------|
| Presence of hypsarrhythmia after ACTH treatment | 2.09| 0.76 - 5.73                            | 0.2  |
| VPA exposure history                        | 1.85| 0.87 - 3.94                            | 0.11 |
| Interval from onset to receive ACTH treatment | 0.97| 0.87 - 1.09                            | 0.7  |
| Presence of hypsarrhythmia before ACTH treatment | 0.66| 0.25 - 1.71                            | 0.4  |
| Number of ASMs                              | 1.41| 0.84 - 2.38                            | 0.2  |
| BASED score                                 | 1.5 | 1.2 - 1.87                             | <0.001|

Note: Bold P value is statistically significant; data are expressed as number, mean standard deviation, or median (range).

Abbreviations: ACTH, Adrenocorticotropic Hormone; ASM, anti-seizure medication; BASED, Burden of AmplitudeS and Epileptiform Discharges; TPM, topiramate; VGB, vigabatrin; VPA, valproate.
Figure S1. Flow chart of screening of the subjects.

Abbreviations: ASMs, anti-seizure medicines; IS, infantile spasms; ACTH, Adrenocorticotrophic hormone
Figure S2. Multivariate Cox regression analysis of relapse risk factors in children with infantile spasms (64 cases) who achieve a short-term response.

Abbreviations: DE, Definitive etiology; NOA, Number of anti-seizure medication; POHAA, Presence of hypsarrhythmia after ACTH; VEH, VPA exposure history=VEH
**Figure S3.** Multivariate Cox regression analysis of relapse risk factors in children with infantile spasms (72 cases) who achieve a short-term response.

| Variable         | Hazard Ratio     | 95% CI       | p-value |
|------------------|------------------|--------------|---------|
| BASED (N=72)     | 1.58             | (1.20-2.10)  | <0.001 |
| NOA (N=2)        | 2.41             | (0.84-7.48)  | 0.196  |
| POHAA (N=64)     | Reference        |              |         |
|                  | 1.21             | (0.74-1.97)  | 0.415  |
| VEH (N=29)       | Reference        |              |         |
|                  | 1.15             | (0.37-3.59)  | 0.711  |
| IFORAT (N=72)    | 0.97             | (0.47-2.07)  | 0.922  |
| POHBAT (N=13)    | Reference        |              |         |
|                  | 0.88             | (0.37-2.17)  | 0.739  |

Events: 27; Global p-value (Log-Rank): 0.000075823
AIC: 205.3; Concordance Index: 0.75

Abbreviations: IFORAT, Interval from onset to receive ACTH treatment; NOA, Number of anti-seizure medication; POHAA, Presence of hypsarrhythmia after ACTH; VEH, VPA exposure history = VEH; POHBA, Presence of hypsarrhythmia before ACTH
**Figure S4.** Kaplan–Meier (KM) survival curves for the patients with a short-term response after ACTH treatment (n=72).

A. Survival curves for the patents with short-term response after ACTH treatment.

B. Survival curves with a cutoff value of BASED score (≥3 or ≤2) for the patents with short-term-response after ACTH treatment.
Figure S5. Pipeline of the EEG-based functional connectivity states analysis

EEG Waveform

Functional Connectivity Matrix

silhouette criterion

K-means Clustering

Functional Connectivity Patterns

Statistical Analysis

\( p = 0.000446 \)