



Heart Rate Variability as An Early Predictor for Children with SARS-CoV-2-Associated Encephalopathy



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INTRODUCTIONS

- Although encephalopathy and encephalitis are uncommon complications of SARS-CoV-2 infection in children, they can lead to significant morbidity and mortality.^{1,2}
- Therefore, the aim of the study is to assess heart rate variability in children with SARS-CoV-2 infection and determine those at risk of progressing to SARS-CoV-2-associated encephalopathy.

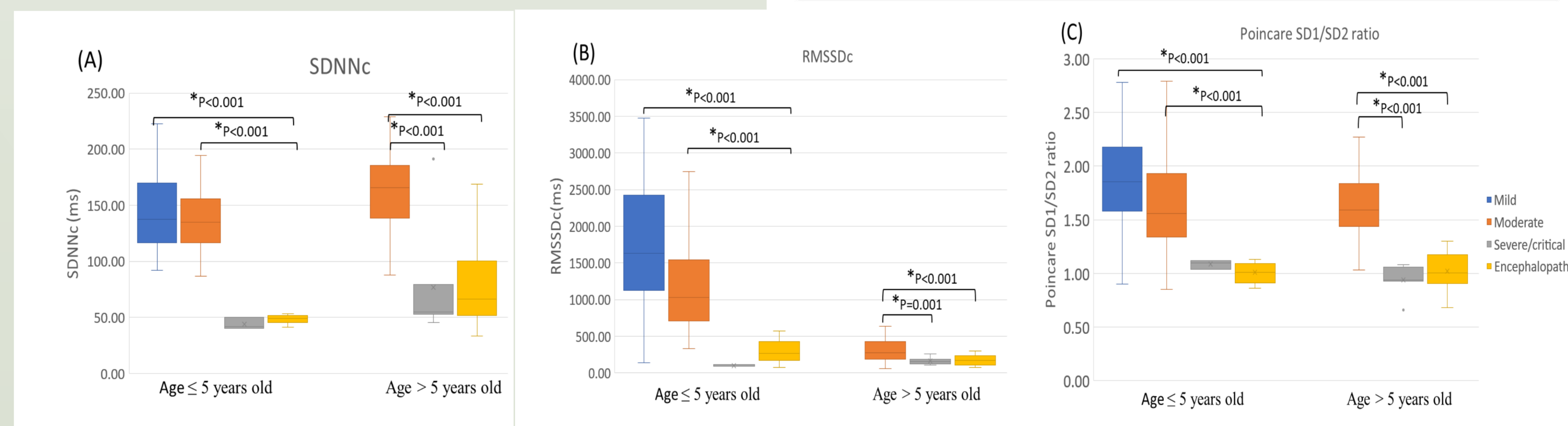
METHODS

- Children with confirmed SARS-CoV-2 infection between September 1, 2022 and December 08, 2023 were prospectively enrolled and divided into **encephalopathic** and **non-encephalopathic groups**.
- The non-encephalopathic group was further classified into mild, moderate, and severe/critical disease groups.
- **One-minute electrocardiography** was recorded on the first day of admission.
- Heart rate variability indices were compared between the encephalopathic and non-encephalopathic groups.

RESULTS

- A total of **72 children** (30 girls [41.7%] and 42 boys [58.3%]) with SARS-CoV-2 infection were enrolled, with an age ranging from 1 month to 18 years.
- Of these children, **15 (20.8%)** were classified into the encephalopathic group, and **57 (79.2%)** were classified into the non-encephalopathic group.

The diagnosis	Number (total=72)
Encephalopathic group	15 (20.8%)
Altered mental status, behavior change	15
Seizures	11
Accompanied with shock	3
Encephalitis	11
Non-encephalopathic group	
Mild severity	20 (27.8%)
Moderate severity	31 (43.1%)
Croup	7
Bronchiolitis	5
Pneumonia	2
Asthma	1
Gastroenteritis with dehydration	11
Febrile convulsions	5
Severe/critical severity	6 (8.3%)
Septic shock	3
Severe pneumonia (intubation)	1
Severe croup (intubation)	1
Myocarditis with shock	1



- We compared heart rate variability indices and found both time domain analysis (**SDNNc and RMSSDc**) and nonlinear Poincaré plot analysis (**SD1/SD2 ratio**) were lower in the encephalopathic group than in the mild and moderate severity non-encephalopathic groups, but similar values between the encephalopathic group and severe/critical disease non-encephalopathic group.

CONCLUSIONS

- Our preliminary results showed that heart rate variability indices could be an early predictor of progression to SARS-CoV-2-associated encephalopathy in children, especially in young infants in whom initial clinical symptoms may be mild and not easily recognized.²

REFERENCES

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2. Tang CM, Kuo CY, Yen CW, et al. Predicting factors for acute encephalopathy in febrile seizure children with SARS-CoV-2 omicron variant: a retrospective study. BMC Pediatr. 2024 Mar 25;24(1):211.

AKNOWLEDGE

