

Association Between Epilepsy with Sleep Apnea and Sudden Cardiac Arrest
in Children

Background:

Children with epilepsy face elevated risks of sudden cardiac arrest (SCA), and coexisting sleep apnea (SA) may further amplify these risks. This study sought to evaluate the occurrence rates and risk levels of SCA and cardiac arrhythmias among pediatric epilepsy patients who also have SA.

Methods:

Through the TriNetX global research platform, we selected pediatric epilepsy cases (under 18 years) diagnosed from January 2000 through March 2025. SA identification relied on ICD-10-CM diagnostic codes and polysomnographic data. We created two matched cohorts of epilepsy patients—those with and without SA—using propensity score matching to control for confounding variables. We monitored SCA and cardiac arrhythmia outcomes during 5- and 10-year observation periods.

Results:

SCA occurrence rates were most elevated among patients with concurrent epilepsy and SA (50.5 per 10,000 person-years), substantially higher than those with epilepsy only (20.0 per 10,000) or SA only (9.0 per 10,000). Epilepsy patients with comorbid SA demonstrated significantly elevated SCA risk (5-year HR: 1.99; 10-year HR: 1.74; both $P < 0.001$) and cardiac arrhythmia risk (10-year HR: 2.06; $P < 0.001$). Treatment-resistant epilepsy further elevated SCA risk (OR: 1.74, 95% CI: 1.25-2.42). Moreover, prolonged continuous positive airway pressure (CPAP) treatment correlated with heightened SCA risk (OR: 3.41, 95% CI: 2.27-5.11), whereas adenotonsillectomy provided protective effects (OR: 0.40, 95% CI: 0.27-0.60).

Conclusions:

Pediatric epilepsy patients with concurrent SA demonstrate markedly elevated risks for SCA and cardiac arrhythmias. Adenotonsillectomy appears to offer protective benefits, while extended CPAP usage may heighten risks. These results emphasize the critical need for personalized therapeutic approaches in pediatric epilepsy patients with comorbid SA to minimize SCA risk.

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作者： 吳博銘*

(報告者請以*表示，如許美鈴*)

服務單位： 成大醫院