

# Hyperventilation may trigger febrile seizures in children

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New research shows that febrile seizures in children may be linked to respiratory alkalosis, indicated by elevated blood pH and low carbon dioxide levels caused by hyperventilation, and independent of the underlying infection severity. Febrile seizures were not observed in susceptible children with fevers brought on by gastroenteritis, suggesting that low blood pH levels (acidosis) may have a protective effect. Full findings now appear in *Epilepsia*, a journal published by Wiley-Blackwell on behalf of the International League Against Epilepsy (ILAE).

Febrile seizures are the most common type of convulsive disorder in children, affecting nearly 1 out of every 25 children and typically occurring between the ages of 6 months and 5 years, according to the National Institute of Neurological Disorders and Stroke (NINDS). Previous studies have suggested that a combination of genetic and [environmental factors](#) cause febrile seizures which have an incidence of up to 8% depending on geographical region and culture.

To further understand the functional changes associated with febrile seizures, a team of investigators, led by Dr. Sebastian Schuchmann, at the Charité-Universitätsmedizin Berlin in Germany and the University of Helsinki in Finland enrolled and analysed 433 children with similar fever levels who were admitted to hospital for febrile seizure (n=213) or [gastroenteritis](#) (n=220). All pediatric patients had their blood pH and carbon dioxide levels measured upon admission.

Researchers found respiratory alkalosis in children with febrile seizures and metabolic acidosis in pediatric patients admitted for gastroenteritis. Febrile seizures did not occur in [children](#) with gastroenteritis, except in a subgroup of 15 patients who had an alkaline blood pH level.

Additionally, 8 patients were admitted on separate occasions for febrile seizures and gastroenteritis; blood pH was elevated when the child was admitted with febrile seizure, but a more acidotic pH was found when the child presented with gastroenteritis.

"Our findings reveal that febrile seizures are associated with respiratory alkalosis and unrelated to the severity of the underlying infection or fever level," concluded Dr. Schuchmann. "Further investigation of methods that control the body's acid-base status may lead to the development of novel therapies for treating febrile seizures." Based on the study results, the authors suggest an application of 5% carbon dioxide in the breathing air as a possible treatment for [febrile seizures](#).

**More information:** "Respiratory Alkalosis in Children with Febrile Seizures." Sebastian Schuchmann, Sarah Hauck, Stephan Henning, Annette Grüters-Kieslich, Sampsa Vanhatalo, Dietmar Schmitz, Kai Kaila. *Epilepsia*; Published Online: September 12, 2011 ([DOI: 10.1111/j.1528-1167.2011.03259.x](#)).

Provided by Wiley

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