

# Febrile seizures and associated neurodevelopmental disorders

Akademisk avhandling

Som för avläggande av medicine doktorsexamen vid Sahlgrenska akademien, Göteborgs universitet kommer att offentligens försvaras i hörsal Arvid Carlsson, Academicum, Medicinaregatan 3, fredagen den 21 februari 2020 kl. 13:00

av Gill Nilsson

Fakultetsopponent:

Docent Margareta Dahl

Uppsala Universitet

## Avhandlingen baseras på följande delarbeten

- I. Nilsson, G., Fernell, E., Arvidsson, T., Neville, B., Olsson, I. & Gillberg, C. 2016. Prevalence of Febrile Seizures, Epilepsy, and Other Paroxysmal Attacks in a Swedish Cohort of 4-Year-Old Children. *Neuropediatrics*, 47, 368-73.
- II. Nilsson, G., Westerlund, J., Fernell, E., Billstedt, E., Miniscalco, C., Arvidsson, T., Olsson I. & Gillberg, C. 2019. Neurodevelopmental problems should be considered in children with febrile seizures. *Acta Paediatrica* 108, 1507-14.
- III. Billstedt, E., Nilsson, G., Leffler, L., Carlsson, L., Olsson, I., Fernell, E. & Gillberg, C. 2019. Cognitive functioning in a representative cohort of pre-school children with febrile seizures. *Acta Paediatrica* [Epub ahead of print].
- IV. Nilsson, G., Lundström, S., Olsson, I., Fernell, E. & Gillberg, C. Febrile seizures from preschool to school; a prospective longitudinal community-based study. In manuscript.

**SAHLGRENKA AKADEMIN  
INSTITUTIONEN FÖR NEUROVETENSKAP OCH  
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# Febrile seizures and associated neurodevelopmental disorders

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## Abstract

**Background:** Febrile seizures (FS) are common in young children. There is a lack of knowledge about possible associations between FS and the child's cognitive and behavioural development. **Aim:** Gain further insight into the area of coexisting neurodevelopmental problems in children with FS. **Methods:** Parents of 4,290 of the total population of 6,076 children (71%) born between July 1, 2008 and June 30, 2009 in the city of Gothenburg, Sweden, completed a questionnaire in conjunction with their child's 4-year health surveillance at the Child Healthcare Centre about any type of seizures that their child might have had. Children with reported FS were invited to a clinical study and parents of 73 children (41 boys, 32 girls) of the total group of 157 children with FS (46%) accepted participation. The methods included a neuropaediatric assessment, the Movement ABC and parental questionnaires; the Five-to-Fifteen (FTF), Strengths and Difficulties Questionnaire (SDQ) and cognitive assessments including the Wechsler Preschool, Primary Scale of Intelligence-III (WPPSI-III). Hospital records were reviewed. Five years after the first clinical study, parents of the 73 children were again contacted and invited to a parental interview, using the Autism-Tics, ADHD and other Comorbidities inventory (A-TAC). Parents of 54 children (32 boys, 22 girls) consented to participating in the interview study. **Results:** Paroxysmal attacks were reported in 248 of the children (5.8%). FS had occurred in 157 children (3.7%), epilepsy in 16 (plus 6 children who were identified through the hospital registers) (0.5%) and other paroxysmal attacks in 75 children (1.7%). Thus, a total of 254 children were found to have any type of paroxysmal attacks (5.9%). When collapsing results from the clinical preschool study and the parental A-TAC interview when the children were 9-10 years, 41% of the children were shown to have or have had at least one neurodevelopmental disorder or definite neurodevelopmental problems, the most common were ADHD or ADHD symptoms. The cognitive assessments showed that children with early onset FS had lower full-scale, verbal and processing speed IQ compared to those with later onset of FS. **Conclusions:** Children with FS were found to have indications of a much increased rate of neuro-developmental disorders/problems compared to the general child population. This does not mean that FS per se are the cause of these other disorders but rather that FS, in some cases, may be a marker for possible neurodevelopmental problems. The results suggest that child health care professionals should consider the possibility of associated neurodevelopmental disorders/problems in children with a history of FS, and that this should be kept in mind also at school-age.

**Keywords:** febrile seizures, preschool children, prevalence, neurodevelopmental disorders, ESSENCE, attention-deficit/hyperactivity disorder, intellectual functioning, A-TAC

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