



Cognition and Quality of Life in Children with New-Onset Epilepsy

Quality of Life in Children with New-Onset Epilepsy: A 2-Year Prospective Cohort Study.

Speechley K, Ferro MA, Camfield CS, Huang W, Levin SD, Smith ML, Wiebe S, Zou G. *Neurology* 2012;79:1548–1155

OBJECTIVES: To assess health-related quality of life (HRQL) over 2 years in children 4–12 years old with new-onset epilepsy and risk factors. **METHODS:** Data are from a multicenter prospective cohort study, the Health-Related Quality of Life Study in Children with Epilepsy Study (HERQULES). Parents reported on children's HRQL and family factors and neurologists on clinical characteristics 4 times. Mean subscale and summary scores were computed for HRQL. Individual growth curve models identified trajectories of change in HRQL scores. Multiple regression identified baseline risk factors for HRQL 2 years later. **RESULTS:** A total of 374 (82%) questionnaires were returned postdiagnosis and 283 (62%) of eligible parents completed all 4. Growth rates for HRQL summary scores were most rapid during the first 6 months and then stabilized. About one-half experienced clinically meaningful improvements in HRQL, one-third maintained their same level, and one-fifth declined. Compared with the general population, at 2 years our sample scored significantly lower on one-third of CHQ subscales and the psychosocial summary. After controlling for baseline HRQL, cognitive problems, poor family functioning, and high family demands were risk factors for poor HRQL 2 years later. **CONCLUSIONS:** On average, HRQL was relatively good but with highly variable individual trajectories. At least one-half did not experience clinically meaningful improvements or declined over 2 years. Cognitive problems were the strongest risk factor for compromised HRQL 2 years after diagnosis and may be largely responsible for declines in the HRQL of children newly diagnosed with epilepsy.

Commentary

Several cross-sectional studies have demonstrated the central role that cognition plays in the behavioral, linguistic/communication, and social comorbidities of children with epilepsy (see review in (1)). Both child and parent reports indicate that these comorbidities, rather than seizure variables, are related to the poor health-related quality of life (HRQOL) found in pediatric epilepsy (2–5). Prospective studies have shown that baseline comorbidities—as well as family and parent variables—predict the short-term outcome of cognition, behavior/emotions, and academic achievement in children with new/recent onset epilepsy (6–9).

A well-designed large scale follow-up study by Speechley et al. examines the trajectories and related variables of parents' reports about child HRQOL at 6, 12, 18, and 24 months after their first seizure. The significant association of cognition and family variables with the 2-year HRQOL trajectory provides additional support for the role of cognition and family factors in the outcome of children with new-onset epilepsy. Interestingly, parents' reports of behavior problems were also significantly related to the 2-year HRQOL but not when cognition was

included in the model. Thus, as demonstrated in the comorbidity studies, cognition also plays a central role in the HRQOL of children with epilepsy.

Differences in the recruitment source (tertiary vs. community), seizure control, as well as comorbid neurological handicaps and developmental disabilities in the HRQOL studies conducted to date might account for the inconsistent relationship between HRQOL and seizure variables in these studies. About one-third of the Speechley et al. sample was experiencing seizures at the 2-year follow-up, but information on seizure frequency was not given. They and other investigators (4, 10) who studied children with relatively well-controlled seizures did not confirm a relationship between seizure variables and child HRQOL.

However, child HRQOL studies in which cognition—rather than behavior problems or psychiatric comorbidities—was a significant predictor often included children with developmental disabilities, low IQ scores, neurological handicaps, and early onset intractable seizures (11–16). Of note, children with developmental disabilities without epilepsy also have poor HRQOL (17).

The study's significant AED effect also implies a possible role for impaired cognition. The authors suggest that this finding might be an indirect measure of poor seizure control that, in turn, is often related to impaired cognition (see review in (1)). Since children with low IQ are at risk for AED adverse ef-



fects involving cognition and behavior (see review in (18)), the significant AED finding might reflect the cognitive difficulties of the children in the study. Lack of cognitive testing and information on how many of the children had cognitive problems and delayed development, therefore, limit generalization of the study's findings.

In contrast to prior HRQOL studies in older youth with childhood-onset epilepsy (10), Speechley et al. studied young children, aged 4–12 years. From the developmental and clinical perspective, younger age and early onset of epilepsy are associated with intractability and intellectual disability (19). Therefore, the age distribution of the sample and if onset before age 5 accounted for the study's cognitive findings would have provided some insight on the mechanism underlying how cognition is associated with HRQOL in pediatric new-onset seizures.

This is also the first study to examine the multiple variables that might adversely affect how parents report child HRQOL (e.g., parent depression, family dysfunction, and stressors) for both general and epilepsy specific instruments for HRQOL. In addition to identifying which children with epilepsy have good or poor outcome (using child medical, parent, family, and demographic variables), this prospective study on trajectories provides information on when to intervene during the course of the illness and how to optimize the outcome. From the chronological perspective, the improvement in child HRQOL occurred in the six months after the first seizure. This can be considered the adjustment period after the acute event of a new onset seizure. But, there was no change in the HRQOL in about one-third of the children and a downhill course in about one-fourth. Since the children in the study had significantly worse HRQOL than U.S. census data for typically developing children, these findings emphasize the need for intervention in about half the children, particularly those with baseline evidence for impaired cognition and family difficulties during the first six months. Because 47% of the parents did not participate in the whole study, the authors suggest that their findings might, therefore, be generalizable only to 4- to 12-year-old children with new-onset seizures whose parents are older, well educated, married, and have a higher income.

From the psychosocial perspective, the authors found that family functioning and family demands are significantly associated with parents' reports of child HRQOL in the multivariate analyses, even though parent depression was significantly associated in the univariate analyses. They suggested that these family variables mediate the impact of maternal depression on child HRQOL in new-onset epilepsy. Family intervention for at-risk families whose children have cognitive problems should, therefore, also address parent depression.

In summary, the large-scale study by Speechley and colleagues on the 2-year trajectory of child HRQOL and its predictors has paved the way for more long-term trajectory and treatment studies in the future. Thus, children with new-onset epilepsy whose parents report cognitive difficulties should undergo comprehensive neuropsychological testing. This information is essential for subsequent appropriate educational intervention. The combination of both new onset seizures and cognitive difficulties is taxing for most families. The study's findings clearly underscore the importance of early interven-

tion in about half the children with new-onset seizures that focuses both on the children's problems with cognition and on family dysfunction.

by Rochelle Caplan, MD

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