Self-Injury among a Community Cohort of Young Children at Risk for Intellectual and Developmental Disabilities

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Objective To identify risk factors for self-injurious behavior in young children with developmental delay and to determine whether that group is also more likely to exhibit other challenging behaviors.

Study design A retrospective chart review of 196 children <6 years of age referred for comprehensive neurodevelopmental evaluations. We analyzed child developmental level, receptive and expressive communication level, mobility, visual and auditory impairment, and co-morbid diagnoses of cerebral palsy, seizure disorders, and autism.

Results Sixty-three children (32%; mean age = 42.7 mo, 63% male) were reported to engage in self-injurious behavior at the time of the evaluation. Children with and without self-injurious behavior did not differ on overall developmental level, expressive or receptive language level, mobility status or sensory functioning, or in rates of identification with cerebral palsy, seizure disorders, or autism. However, the self-injurious behavior group was rated significantly higher by parents on destructive behavior, hurting others, and unusual habits.

Conclusions Although self-injurious behavior was reported to occur in 32% of the cohort, the modal frequency was monthly/weekly and the severity was low. No significant differences were found for risk markers reported for adults, adolescents, and older children with intellectual and developmental disabilities. However, self-injurious behavior was comorbid with other behavior problems in this sample. *(J Pediatr 2010;157:979-83)*.

Self-injurious behavior is one of the most striking and devastating conditions associated with intellectual and developmental disabilities.[1] Beyond the obvious physical injury, self-injurious behavior can be very distressing for parents and caregivers,[2] severely limit a person's participation in community activities,[3] and lead to placement in a more restrictive living situation.[3] Once manifest, self-injurious behavior is likely to continue over the lifespan, is resistant to treatment, and is costly.[4]

For adults with intellectual and developmental disabilities, considerable effort has been directed to determining risk factors for self-injurious behavior. A meta-analysis study found that individuals with severe/profound intellectual and developmental disabilities, a diagnosis of autism, and deficits in receptive and expressive communication are more likely to show self-injurious behavior.[5] Similarly, visual impairment,[1] impaired hearing,[6] impaired mobility,[6] and the presence of seizures[7] have also been associated with self-injurious behavior. Although sex was not a risk factor in a meta-analysis,[5] female sex was a significant risk factor in one study.[8] Moreover, self-injurious behavior is a prominent behavioral feature of Fragile X, Lesch-Nyhan, Prader-Willi, and Smith-Magenis syndromes.[9] Furthermore, adults with self-injurious behavior are also more likely to exhibit other challenging behaviors such as physical aggression, property destruction, and stereotyped behavior.[10]

Studies of self-injurious behavior in older children and adolescents suggest that those with severe/profound intellectual and developmental disabilities are most likely to exhibit self-injurious behavior.[11-13] Lower daily living skills,[12] impaired ambulation,[14] visual sensory impairment,[15] autism,[16] and particular genetic causes[9] have been associated with self-injurious behavior. There are no published data on the cooccurrence of self-injurious behavior and other challenging behavior problems in older and children and adolescents with intellectual disability (ID).

The available studies of older children who engage in self-injurious behavior were not designed to assess risk at an earlier age (eg, 3 to 6 years) when self-injurious behavior may first emerge.[17] This study was performed to determine (1) whether young children with reported self-injurious behavior are more likely to exhibit lower overall developmental functioning, lower receptive or expressive communication levels, visual or hearing impairment, impaired mobility, or cooccurring diagnoses of autism, cerebral palsy, or seizure disorder and (2) whether young children engaging in self-injurious behavior would have more general behavior problems than young children who did not exhibit self-injurious behavior.

CBCL	Child Behavior Checklist
CDI	Child Development Inventory
ICAP	Inventory for Client and Agency Planning
ID	Intellectual disability

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Methods

The sample for this study was drawn from 217 consecutive case records from a neurodevelopmental pediatric clinic at a children's specialty hospital. To be eligible for this study, children had to be aged 18 to 72 months when they participated in a comprehensive diagnostic evaluation by a multidisciplinary team and have a significant developmental delay in at least two functioning domains as assessed by the Child Development Inventory (eg, social, self-help, gross motor, fine motor, expressive language, or language comprehension).[18] One hundred ninety-six children were identified, with an average age of 42.9 months and an average General Development quotient of .62 (for this study, the CDI General Development age equivalent score was converted to a developmental quotient by dividing the obtained age equivalent by the child's chronological age). The sample was predominantly male (64.8%) and white (83%). They were typically from two-parent households (84%) in which the adults had at least a high school degree (95%) and held positions as semiprofessionals or higher (52%). The study was approved by our Institutional Review Board.

Measures

Parents provided information regarding their child's sex, age, race, maternal/paternal levels of education, and maternal/paternal occupation on a demographic questionnaire. The Child Development Inventory (CDI)[18] is a parent report measure of development for children aged 18 to 72 months. It contains 270 items that yield an overall General Development Scale and scores in 8 domains. Ireton and Glascoe[19] reported acceptable levels of reliability and validity for the CDI in a sample that included young children with developmental delays. CDI scores are reported in terms of age equivalents in months.

The Inventory for Client and Agency Planning[20] (ICAP) is a comprehensive instrument designed to assess diagnostic status (primary diagnosis, as well as all other diagnosed conditions—eg, autism and cerebral palsy) and functional limitations (eg, vision, hearing, and mobility), as well as adaptive functioning and maladaptive behavior for people with developmental disabilities (infant through adult). The maladaptive portion of the ICAP includes 8 problem behaviors (Hurtful to Self, Hurtful to Others, Destructive to Property, Disruptive Behavior, Unusual or Repetitive Habits, Socially Offensive Behavior, Withdrawal or Inattentive behavior and Uncooperative behavior). Although the ICAP does not include stereotyped behavior as a separate item, several of the topographies listed as examples of Unusual or Repetitive Habits are consistent with that terminology. The frequency of problem behaviors is rated on a 6-point scale as occurring "never" to "hourly" and severity of these behaviors is rated on a 5-point scale as "not serious" to "extremely serious." Bruininks et al[20] report test-retest and interrater reliabilities for each domain ranging from 0.80 to 0.90, as well as evidence of construct, concurrent, and content validity. The primary variable of interest in this study was whether the parent or caregiver endorsed the ICAP item Hurtful to Self, indicating that the behavior had occurred within the last month. This item is defined as "injures own body—for example, by hitting self, banging head, scratching, cutting or puncturing, biting, rubbing skin, pulling out hair, picking on skin, biting nails or pinching."

The Child Behavior Checklist (CBCL)[21] 1.5-5 contains 99 specific child behaviors that parents/caregivers rate on a 3-point scale: 0 (Not true of the child), 1 (Somewhat or Sometimes True), or 2 (Very True or Often True) over the past month. The checklist yields an Internalizing Problems score, an Externalizing Problems score, and a Total Problems score. Each of the measures yields a separate T-score (Mean = 50, SD = 10). T-scores between 60 and 63 are considered subclinical, and scores above 63 are considered to be in the clinical range. Achenbach and Rescorla[21] report extensive psychometric data in support of the CBCL 1.5-5. A recent study provided further empirical support for the validity of the CBCL 1.5-5 for children with developmental delay and autism spectrum disorder.[22]

Table I. Prevalence of Risk Factors by SIB status

Risk Factor*	SIB (n = 63)	No SIB (n = 133)
Vision impairment	13.3%	6.1%
Hearing impairment	10.0%	11.5%
Seizure disorder	2.0%	2.2%
Autism diagnosis	15.8%	9.7%
Mobility (not walking)	14.3%	14.0%
Cerebral Palsy	3.0%	1.5%

*As assessed by Inventory for Client and Agency Planning

Data Analysis

Summary-level descriptive and inferential parametric analyses (analyses of variance) were used as initial tests for differences between children with and without reported self-injurious behavior.

Results

Of the 196 eligible participants, 63 (32%) were reported to exhibit self-injury within the last month. The mean age of those children was 42.7 months (range 20 to 70 months) and 63% were male. The presence of self-injurious behavior was independent of developmental level or chronological age. Self-injurious behavior was reported to occur less than monthly for 14 children, 1 to 3 times a month for 10 children, 1 to 6 times a week for 19 children, 1 to 10 times a day for 15 children, and one or more times an hour for 5 children. The children exhibiting self-injurious behavior did not differ in rates of visual or hearing impairment, mobility, or diagnoses of autism, cerebral palsy, or seizure disorder as compared with the children who did not exhibit self-injury (**Table I**). Although the self-injurious behavior group had generally lower scores on the CDI General Development scale and the various developmental subscales, the two groups were not significantly different (**Figure**). Because of the low