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# Disabling Conditions and Registration for Child Abuse and Neglect: A Population-Based Study

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**ABSTRACT.** *Objective.* **To study the relationship between disabling conditions and registration for child abuse and neglect in a 19-year whole-population birth cohort**

*Setting.* **West Sussex area of the United Kingdom.**

*Study Design.* **Retrospective whole-population cohort.**

*Main Outcomes.* **Child-protection registration, physical abuse, sexual abuse, emotional abuse, and neglect.**

*Population and Participants.* **Infants born in West Sussex (119 729) between January 1983 and December 2001 with complete data including birth weight, gestational age, maternal age, and postal code.**

*Results.* **Cerebral palsy, speech and language disorder, learning difficulties, conduct disorders, and nonconduct psychological disorders were all significantly associated with child-protection registration before adjustment, and all but cerebral palsy retained significance after adjustment for birth weight, gestational age, and socioeconomic status. Autism and sensory disabilities (vision and hearing) were not associated with an increased risk of child-protection registration. Conduct disorders and moderate/severe learning difficulty were associated with registration in each of the 4 categories after adjustment for socioeconomic status, birth weight, and gestational age. Children with speech and language disorders and mild learning difficulties were at increased risk of physical abuse, emotional abuse, and neglect. Nonconduct psychological disorders were associated with all categories except neglect, and cerebral palsy was associated with all categories except physical abuse and neglect.**

*Conclusions.* **Children with disabling conditions seem to be at increased risk of registration for child abuse and neglect, although the pattern of registration varies with the specific disabling condition. The strong association with registration noted for conditions such as conduct disorder and learning difficulties is likely to arise, in part, because these conditions share a common** etiologic pathway with child abuse and neglect. *Pediatrics* **2005;116:609–613;** *child abuse and neglect, disabling conditions, birth weight, socioeconomic status.*

ABBREVIATIONS. ICD-9, *International Classification of Diseases, Ninth Revision*; OR, odds ratio; CI, confidence interval; AOR, adjusted odds ratio.

There is a widely held view that disability predisposes to registration for child abuse and neglect. However, an unpublished systematic review of observational studies[1] shows that the evidence for this relationship is based on studies of cohorts of either disabled children or abused children and not on whole-population studies. Estimates of increased risk of child abuse registration among disabled children[2] or disability among abused children[3] have been derived by extrapolating from these highly selected populations to national populations and comparing disability and abuse rates. With the exception of 1 study,[4] all these studies have supported the view that disability increases risk of child abuse and neglect. However, extrapolation from selected cohorts to whole populations is open to serious potential for bias. The systematic review was unable to identify any studies based on whole-population birth cohorts in which the temporal relationship between disability and child abuse and neglect was clearly established.

The factors predisposing disabled children to abuse (if the association is confirmed) may differ depending on the type of disability (for example, learning difficulties compared with physical disability) and the type of abuse. Severity of disability might also influence risk. The studies linking abuse and disability tend to focus on disability associated with psychological, emotional, and learning problems.[5,6]

Socioeconomic status is known to be associated with registration for child abuse and neglect.[7] Birth weight is also associated with disability[8] and has also been shown in 1 study to be associated with child abuse.[9] The potential for confounding of the relationship between abuse and disability by socioeconomic status and/or birth weight has not been studied.

This study is based on a 19-year whole-population birth cohort (1983–2001) in which data on childhood disability were regularly recorded, updated, and linked with data from the child abuse register covering the same population from 1986 onward. This is

the first study to examine the risk of registration for child abuse, adjusted for socioeconomic status and birth weight, in all major categories among children with a range of disabling conditions in a whole-population birth cohort.

## METHODS

This study is a retrospective whole-population birth cohort based on linkage of data from the West Sussex (United Kingdom) Child Health Computer including a special-conditions file[10] with the West Sussex Social Services' child-protection register on children born between January 1983 and the end of December 2001. The study was approved by the local research and ethics committee.

### Data Collection

The West Sussex Child Health Computer collects data on all children born with addresses in the West Sussex area, including those born outside the area (eg, in tertiary units). Children's files are initiated on the computer system by the birth notification that includes data on maternal age, birth weight, gestational age, and postal code of the address at the time of birth. Records on all children are updated regularly throughout childhood. Data on children with special needs are entered onto the special-conditions file of the Child Health Computer. The special-conditions file is maintained by a pediatrician who continually updates entries by using information from health care and education professionals. An annual review, completed by health professionals working with the child and family, updates health information held on children. All special-conditions file entries are coded according to the *International Classification of Diseases, Ninth Revision* (ICD-9) and classified further by severity of disability resulting from the condition (condition not causing disability; moderate defect requiring treatment; significant defect requiring treatment or support; severe defect; severe defect requiring special care facilities).

Children are entered onto the West Sussex child-protection register after a child-protection investigation including a child-protection conference. The criteria for registration are laid out in the West Sussex Area Child Protection Committee child-protection procedures and state:

> "The child can be shown to have suffered ill treatment or impairment of health or development as a result of physical, emotional or sexual abuse or neglect, and the professional judgment is that further ill treatment or impairment are likely."

Children are only registered under physical and emotional abuse and neglect if abuse has actually occurred. A child who has not yet suffered sexual abuse may be registered for sexual abuse if there is a known offender in the household. The entries on the electronic register are coded by category of registration with the main category first: physical abuse; sexual abuse; emotional abuse; neglect and nonorganic failure to thrive. For the purposes of this study, only data on the main category of abuse are available, and the numerator used is individual children, not abuse incidents.

### Data Linkage

The following data files were linked to form a single anonymized data file:

1. West Sussex Child Health Computer data file with special-conditions files from 1983–2001; and
2. West Sussex Social Services' child-protection register, which contains data on all children born between 1983 and 2001 with entries on the register during the period of 1986–2003.

Linkage was undertaken in accordance with the Data Protection Act and with permission of the local research and ethics committee.

### Data Extraction

For the purposes of this study, a single anonymized data file was created containing the following variables:

- *Outcomes of interest:* registration on the child-protection register in any of the 4 categories listed above and extracted from the West Sussex Social Services' child-protection register.
- *Main independent variables of interest:* data extracted from the special-conditions file on selected disabling conditions: cerebral palsy (ICD-9 code: 343); autism (ICD-9 code: 2990); moderate/severe conduct disorder (ICD-9 code: 312); moderate/severe nonconduct psychological disorders (ICD-9 codes: 300–311, 313, 314, 317–319); moderate/severe speech and language disorders (ICD-9 code: 3153); moderate/severe learning difficulties (IQ < 70); and sensory disorders, vision and hearing (ICD-9 code: 365–389).
- *Confounding variables:* birth weight group (<1000, 1000–1499, 1500–1999, 2000–2499, 2500–2999, 3000–3499, 3500–4499, and ≥4500 g); gestational age group (<34, 34–36, and ≥37 weeks); maternal age group (<20, 20–29, 30–39, and ≥40 years); and socioeconomic status based on area of residence at birth created by conversion of postal code into enumeration district (the lowest census unit) and ranking enumeration districts into quintiles by their score on the Townsend Deprivation Index[11] calculated from the 1991 census.

### Data Analysis

Only children with complete data for all variables of interest were included in the analysis. Odds ratios (ORs) with 95% confidence intervals (CIs) for registration in any child abuse category and for each category separately according to each of the disabling conditions were estimated before and after adjustment for birth weight, gestational age, maternal age, and socioeconomic status by using binary logistic regression. All analyses were conducted in SPSS 10.[12]

## RESULTS

Of 158 229 children entered onto the West Sussex Child Health Computer in the 19-year period (1983–2001), 119 729 (76%) had complete data and were included in this study. Missing postal-code data accounted for 33 128 children with missing data; of the remainder (5406), maternal age data were missing in 5187, gestational age in 168, and birth weight in 51. Rates of child abuse registration and disabling conditions among the children without complete data did not differ from those included in the study. Table 1 shows the rates of child abuse registration according to category, the prevalence rates of the disabling conditions, and birth weight, gestational age, and maternal age distributions in the study sample.

Table 2 shows the unadjusted ORs and adjusted ORs (AORs) for child abuse registration in any category by disabling conditions. With the exception of autism and sensory disabilities, the remaining disabling conditions were associated with child abuse registration in any category in bivariate analysis; however, the association of cerebral palsy with registration in any category was not significant at the 5% level after adjustment for birth weight, gestational age, maternal age, and socioeconomic status. Conduct disorders, nonconduct psychological problems, speech and language disorders, and moderate/severe learning difficulties retained a significant association with registration, although the effect sizes were attenuated. Children with conduct disorders were 7 times more likely to be registered in any category after adjustment, children with learning difficulties almost 5 times as likely, children with nonconduct psychological problems 4 times as likely, and those with moderate/severe speech and language disorders almost 3 times as likely.

**TABLE 1.** Rates of Child Abuse Registration, Disabling Conditions, and Distribution of Birth Weight, Gestational Age, and Maternal Age in the Study Sample

| | n | Rate, per 1000 |
|---|---|---|
| Child abuse registration* | | |
|     All categories | 1853 | 15 |
|     Physical abuse | 616 | 5 |
|     Sexual abuse | 246 | 2 |
|     Emotional abuse | 635 | 5 |
|     Neglect | 509 | 4 |
| Disabling condition | | |
|     Cerebral palsy | 239 | 2 |
|     Conduct disorder (moderate/severe) | 355 | 3 |
|     Nonconduct psychological problems (moderate/severe) | 213 | 2 |
|     Autism | 326 | 3 |
|     Speech and language disorders (moderate/severe) | 1073 | 9 |
|     Moderate/severe learning difficulties | 1067 | 9 |
|     Sensory disability (vision and hearing) | 380 | 3 |
| Birth weight group | | |
|     <1000 g | 214 | 2 |
|     1000–1499 g | 622 | 5 |
|     1500–1999 g | 1560 | 13 |
|     2000–2499 g | 4805 | 40 |
|     2500–2999 g | 19 030 | 159 |
|     3000–3499 g | 43 938 | 367 |
|     3500–4499 g | 47 664 | 398 |
|     ≥4500 g | 1896 | 16 |
| Gestational age group | | |
|     <34 wk | 1947 | 16 |
|     34–36 wk | 5319 | 45 |
|     ≥37 wk | 112 463 | 939 |
| Maternal age group | | |
|     <20 y | 4618 | 39 |
|     20–29 y | 60 817 | 508 |
|     30–39 y | 51 419 | 429 |
|     ≥40 y | 2875 | 24 |

**TABLE 2.** Disabling Conditions and All Categories of Child-Protection Registration

| Condition | Unadjusted OR (95% CI) | AOR (95% CI)* |
|---|---|---|
| Cerebral palsy | 3.12 (1.70, 5.72) | 1.79 (0.96, 3.35) |
| Conduct disorder (moderate/severe) | 11.48 (8.52, 15.46) | 7.59 (5.59, 10.31) |
| Nonconduct psychological problems (moderate/severe) | 5.24 (2.14, 8.74) | 4.38 (2.61, 7.36) |
| Speech and language disorders (moderate/severe) | 3.26 (2.44, 4.34) | 2.96 (2.22, 3.96) |
| Moderate/severe learning difficulties | 6.50 (5.25, 8.09) | 4.69 (3.75, 5.86) |
| Sensory disability (vision and hearing) | 0.87 (0.36, 2.11) | 0.76 (0.31, 1.83) |
| Autism | 0.82 (0.30, 2.19) | 0.79 (0.29, 2.13) |

* Adjusted for birth weight, gestational age, maternal age, and socioeconomic status.

**TABLE 3.** Unadjusted ORs (95% CIs) for Different Categories of Abuse According to Disabling Conditions

| Disabling Conditions | Physical Abuse | Sexual Abuse | Emotional Abuse | Neglect |
|---|---|---|---|---|
| Cerebral palsy | 5.08 (2.25, 11.47) | * | * | 5.12 (2.10, 12.46) |
| Conduct disorder (moderate/severe) | 6.44 (3.52, 11.80) | 10.27 (4.81, 21.94) | 16.49 (11.10, 24.6) | 10.14 (5.90, 17.43) |
| Nonconduct psychological problems (moderate/severe) | 3.75 (1.39, 10.12) | 2.32 (0.32, 16.57) | 9.54 (4.99, 17.91) | 3.40 (1.08, 10.66) |
| Speech and language disorders (moderate/severe) | 4.92 (3.28, 7.38) | 1.40 (0.45, 4.39) | 4.55 (3.01, 6.87) | 4.23 (2.64, 6.80) |
| Moderate/severe learning difficulties | 3.87 (2.47, 6.07) | 8.03 (4.82, 13.38) | 3.96 (2.56, 6.15) | 5.87 (4.06, 8.48) |
| Sensory disorders | 0.52 (0.07, 3.73) | * | * | * |
| Autism | 1.23 (0.31, 4.96) | * | * | * |

* Numbers are too small for meaningful analysis.

Tables 3 and 4 show unadjusted ORs and AORs for subcategories of abuse by disabling conditions. Apart from autism and sensory disorders, all the remaining disabling conditions were significantly associated with physical abuse registration before and after adjustment for birth weight, gestational age, maternal age, and socioeconomic status. Children with these conditions were at between 3 and 4 times increased risk of registration in the physical abuse category. A similar pattern was seen for registration in the neglect category. Numbers were too small for meaningful analysis of the association of autism and sensory disorders with neglect, but cerebral palsy, conduct disorders, speech and language disorders, and moderate/severe learning difficulties were all significantly associated with neglect after adjustment. Nonconduct psychological disorders were associated with neglect before adjustment, but the

| Disabling Conditions | Physical Abuse* | Sexual Abuse* | Emotional Abuse* | Neglect* |
|---|---|---|---|---|
| Cerebral Palsy | 3.00 (1.29, 6.78) | † | † | 2.71 (1.08, 6.80) |
| Conduct disorder (moderate/severe) | 4.09 (2.22, 7.54) | 7.65 (3.56, 16.41) | 11.58 (7.72, 17.37) | 8.22 (4.76, 14.18) |
| Nonconduct psychological problems (moderate/severe) | 3.06 (1.13, 8.28) | 1.99 (0.28, 14.28) | 8.04 (4.22, 15.30) | 2.73 (0.87, 8.62) |
| Speech and language disorders (moderate/severe) | 3.43 (2.18, 5.40) | 1.27 (0.41, 3.99) | 4.21 (2.78, 6.34) | 3.79 (2.35, 6.10) |
| Moderate/severe learning difficulties | 3.40 (2.25, 5.12) | 6.38 (3.81, 10.68) | 2.93 (1.88, 4.57) | 5.34 (3.68, 7.23) |
| Sensory disorders | 0.44 (0.06, 3.13) | † | † | † |
| Autism | 1.23 (0.31, 5.05) | † | † | † |

* Data are adjusted for birth weight, gestational age, maternal age, and socioeconomic status.
† Numbers are too small for meaningful analysis.

association was nonsignificant once confounding variables were accounted for.

Risk of registration in the sexual abuse category was >7 times higher among children with conduct disorders and 6 times higher among children with moderate/severe learning difficulties after adjustment, but the risk for children with the remaining disabling conditions was not significantly increased. Children with conduct disorders were >11 times more likely and those with nonconduct psychological disorders >8 times more likely to be registered in the emotional abuse category after adjustment. The association of speech and language disorders and learning difficulties with emotional abuse remained after adjustment. Estimates of ORs for sexual abuse and emotional abuse registration according to cerebral palsy, autism, and sensory disorders were not possible because of small numbers.

## DISCUSSION

This study, which to our knowledge is the only whole-population study of the association of disability and child abuse registration, shows the association of specific disabling conditions with child abuse registration after adjustment for confounding variables but does not support a blanket assumption of vulnerability of all disabled children to abuse. Children with autism and sensory disorders (vision and hearing) were not at increased risk of abuse registration, and although cerebral palsy was associated with an increased risk of registration in the physical abuse and neglect categories, the association with registration in any category became nonsignificant at the 5% level after adjustment.

The findings suggest variation in association depending on the type of disability and the category of abuse. Children with conduct disorders and those with moderate/severe learning difficulties seem to be at increased risk of registration in all 4 abuse categories. Children with nonconduct psychological disorders and those with speech and language disorders seem to be at increased risk of registration in physical, emotional, and neglect categories but not in the sexual abuse category.

The findings of this study do not necessarily support the view that disability predisposes to child abuse. Reverse causation may be responsible for the association in the case of cerebral palsy. Disabling conditions such as conduct disorders, speech and language disorders, and learning difficulties may share common etiologic pathways with abuse, which makes it difficult to ascertain if the abuse is precipitated by the child's condition or arises in parallel with the disability. It is notable that autism and sensory disorders, the 2 disabling conditions studied that do not share etiologic pathways with abuse and are unlikely to result from abuse, show no association with abuse registration. The strong association of learning disability with sexual abuse is consistent with the widespread belief that such children are more vulnerable to this form of abuse. However, the equally strong association with conduct disorder is more complex in view of the potential for reverse causation.

Another reason for caution when interpreting the results of this study is the reliance, in common with the majority of studies of child abuse, on registration as the measure of abuse. Registration almost certainly underestimates the extent of abuse. However, because the focus of this study is the relationship between disability and abuse, the resultant misclassification bias would only affect the results if it operated differentially among disabled and nondisabled children. Although it is possible that the commonly held view that disability predisposes to abuse may have resulted in a reduced threshold for registration among disabled children, as far as we are aware there is no evidence to support this contention.

### Comparison With Published Studies

Previous studies, based on samples of either disabled[2,5,6,13,14] or abused children,[3,4,15–19] have reported increased risk of abuse among children with psychological and psychiatric problems,[3,14,15] learning difficulties and mental retardation,[2,14] speech and language disorders,[15] and developmental problems.[17] A few studies have failed to show any association of abuse with behavior problems,[4,13] speech and language disorders and learning disability,[3] and multiple handicaps.[13] Comparison with the findings of this study is difficult because of imprecision in the definitions of disability used in many of the published studies.

### Strengths and Limitations

The main strength of this study is that it is population based, which allowed us to examine the relationship between disability and abuse in a whole population rather than in highly selected subgroups.

This eliminates the selection bias inherent in studies based on disabled or abused populations alone. The availability of population-based data on potential confounding variables has enabled us to account for confounding in the relationship between abuse and disability. Very few of the previously reported studies have accounted for potential confounding of the relationship by birth weight or socioeconomic status. The special-conditions file of the West Sussex Child Health Computer has enabled us to identify children with specific disabling conditions and avoid bias associated with imprecision in disability definitions. Linkage with the West Sussex Social Services' child-protection register allowed us to study children registered in all major categories of abuse.

Absence of adequate data identifying date of onset of disabling conditions limits our ability to distinguish between preabuse and postabuse disability. Thus, we cannot conclude that cerebral palsy predisposes to physical abuse despite the significant association shown in the study. The study covers a 19-year period in which diagnostic classifications and fashions have changed. For example, autism is much more readily diagnosed than it was 19 years ago. Similarly, child abuse registration categories and thresholds for registration are likely to have changed over the study period. These changes are likely to have led to misclassification bias, affecting the classification of both disability and abuse. However, unless they can be shown to differentially increase or decrease the estimate of abuse rates among disabled and nondisabled children, they are unlikely to systematically bias the relationships studied. The length of the study period means that the period of risk exposure varies from 18 years to 1 year, but because this is true for disabled and nondisabled children, it is unlikely to bias the relationship of disability with abuse.

## CONCLUSIONS

This is the first whole-population–based study to report on the relationship of disability with abuse registration. Although we are unable to conclude that specific disabling conditions predispose to abuse, children with disabling conditions seem to be at increased risk of registration for child abuse and neglect. The pattern of registration varies with both the specific disabling condition and the category of registration. The strong association with registration noted for conditions such as conduct disorder and learning difficulties is likely to arise, in part, because these conditions share a common etiologic pathway with child abuse and neglect.

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