

Intelligence and achievement of children referred following sexual abuse

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Objective: Little is known about the prevalence of intellectual and academic problems in sexually abused children. Such problems may have significant implications for their management. This study examined the prevalence of such problems in a population of Australian children referred for sexual abuse evaluation. The study also assessed the clinical utility of the Parents' Evaluation of Developmental Status (PEDS) questionnaire as a screening tool for learning and developmental problems in this population.

Methods: Over a 12-month period, children referred for sexual abuse evaluation to the Mater Children's Hospital Child Protection Unit were enrolled and background demographic and abuse related data collected. The children then completed standardized psychometric assessments. Their parents completed Child Behavior Checklists (CBCL) and PEDS questionnaires. Day care providers and schoolteachers completed the corresponding Caregiver or Teacher Report Forms (TRF).

Results: A total of 21 of the 35 eligible children completed the assessment during the study period. Mean scores for intelligence and academic achievement were within the average range. However, three (14%) of the tested children were intellectually impaired and three (14%) showed academic underachievement. Sixty-two per cent of children had problems in the clinical range on the CBCL and 33% on the TRF. The PEDS showed a sensitivity of 64%, specificity of 60% with a positive predictive value of 77%.

Conclusion: In this population of referred children, over one quarter showed problems with intellectual impairment or academic under achievement. Most of these children were not receiving learning support at school. A high index of suspicion is therefore required when assessing sexually abused children for comorbid intellectual and learning problems.

Key words: child abuse, sexual; intelligence.

The number of Australian children on Care and Protection Orders and in out-of-home care is increasing. Incidence figures for Queensland in 2000–01 identified a rate of 7.4 per 1000 children subject to substantiated Child Protection notifications, with 14% of these involving child sexual abuse (CSA). These rates are almost double for indigenous children.¹ International prevalence studies of CSA however, suggest that these figures represent only the tip of the iceberg. It has been estimated that the true prevalence of CSA within the United States is 12–17% for women and 5–8% for men.² The long-term consequences of CSA are well documented and include depression, anxiety and low self-esteem, substance abuse, sexual problems and post-traumatic stress disorders.^{3–5}

The relationship between CSA and neurodevelopmental status is complex. First, a child's psychological development may increase their risk of abuse. It has been suggested that children with intellectual or other learning/developmental disabilities are at greater risk of CSA.^{6,7} This may be due to a poor sense of personal safety, little or no appropriate sexual knowledge or an inability to disclose.^{6,8} Second, child abuse itself increases the risk of adverse neurodevelopmental outcomes. Recent research has proposed that the stress of maltreatment experiences in early childhood leads to alterations of biological stress systems with subsequent adverse influence on brain development.^{9–13} Whilst sexual abuse tends to occur at older ages when brain development is more defined, children who have been sexually abused are more likely to have experienced other adverse childhood events such as psychological abuse, neglect and family dysfunction.¹⁴ These factors may predispose

to child sexual abuse as well as adversely affect brain development. Third, the developmental status of the child victim is also an important factor in determining their response to sexual abuse. Research identifies that this response is also modified by familial and environmental backgrounds as well as the nature of the abusive event/s.⁵ Indeed, the cognitive, social and environmental factors may be more predictive of adjustment than the abuse itself.¹⁵

Children who have been subject to CSA may therefore be at risk for adverse developmental outcomes either from child abuse itself, their pre-existing cognitive/developmental disabilities and/or their familial/environmental backgrounds.

The intellectual development and academic performance of children have become public health issues because of their implications for the future performance and quality of life.¹⁶ Children with learning disabilities are at greater risk of emotional difficulties, social and behavioural problems.^{17,18} Skills such as literacy are closely related to employment stability, incidence of unemployment and income.¹⁹ Intellectual and learning problems, particularly when unrecognized can therefore have substantial negative effects on children.

Little is known about the psychometric profiles of sexually abused children. Waterman and Lusk summarized the research examining the psychometric profiles of sexually abused children.²⁰ They concluded that sexually abused children generally do not show global deficits, although verbal IQ scores may be lower than for non-abused children. Achievement was generally commensurate with IQ scores. More recent work has demonstrated increased rates of educational problems and

special education requirements in sexually abused children.²¹ Negative correlations have been noted between verbal IQ and severity of abuse.²² There is even less research on the maltreatment of Australian children with disabilities. Tomison reported that in a sample of 293 cases of suspected child maltreatment, 11% presented with some form of learning difficulty and that 12% of sexually abused children had learning difficulties.²³

The purpose of this study was to establish the prevalence of intellectual impairment and academic achievement problems in children referred for evaluation of sexual abuse to tertiary Queensland Child Protection Services. Rates of CBCL and TRF derived problem behaviours were also determined. It was anticipated that these children would show higher rates of such difficulties than the general population. Because formal psychometric testing is not routinely performed, the study also aimed to determine the utility of the Parents' Evaluation of Developmental Status (PEDS) as a screening tool for identifying children with intellectual and behavioural concerns who may require further assessment.

METHODS

The Mater Hospital Research Secretariat's Ethics Committee granted ethical approval for the study.

Population

All children referred for sexual abuse evaluation to the Child Protection Unit (CPU), Mater Children's Hospital, over the 12-month period ending 30 June 2002 were considered for enrolment. The Mater's CPU is a tertiary, hospital based unit which provides assessment and management services for children where concerns exist regarding maltreatment. It forms part of the local Suspected Child Abuse and Neglect (SCAN) Team, with representatives from Queensland Police and the Department of Family Services. All notifications regarding suspected CSA within Southern Brisbane are made to this team. Southern Brisbane has a population of approximately 500 000.

Children were eligible for enrolment when the CPU paediatrician assessing the child considered it highly likely that the child had been sexually abused. This decision was based on the child's disclosures, behavioural changes suggestive of inappropriate sexual experience, physical findings on examination and information available from police and Department of Families investigations at that time. The child's family were informed about the study during their initial medical review and provided with written information. A follow up phone call was made 2 weeks later to book appointments. Informed consent was obtained prior to enrolment.

Data collection

All children had demographic details collected including age, sex, postcode of residence and the family's primary income source (employment or welfare benefit). Data were also collected from the parents and caregivers as to whether they had ever been abused as a child (yes/no) or had used illicit drugs (yes/no). Finally, data were collected regarding the nature of the sexual abuse (penetrative, fondling, orogenital contact), age at onset, duration of abuse (less than 1 month, 1–3 months, 3–6 months, greater than 6 months) and the relationship of the abuser to the child. Parents were also asked if the child was currently receiving any learning support.

Children returned for assessment approximately 1 month after their initial appointment. Families were asked to complete the Child Behavior Checklist (CBCL) and for children 8 years and under, the Parents' Evaluation of Developmental Status (PEDS). The child's schoolteacher was asked to complete the Teacher Report Form (TRF) and indicate if any learning support was being provided. The teacher was not informed by research staff of the nature of the study or of the child's sexual abuse. Children then had standardized psychometric assessments performed as follows; Children under 4 years of age had the Griffiths Developmental Assessment, those 4–6 years of age completed the Wechsler Pre-School and Primary Scale of Intelligence-Revised (WPPSI-R) and those over 7 years, the Wechsler Intelligence Scale for Children-Revised (WISC-III-R) and Wechsler Individual Achievement Test (WIAT).

The CBCL and TRF are widely used instruments in the scientific community, with established reliability and validity.^{24,25} The usefulness and applicability of CBCL cut-off scores in Australian children has also been supported.²⁶ The PEDS is a 10-item parent administered questionnaire used to identify primarily developmental problems in children 8 years and under.²⁷ There are eight items with three levels of response (yes/no/a little) and two open ended questions. Responses are scored to characterize whether parents' concerns are significant or non-significant. The presence of one or more significant concerns constituted a positive screen.

Outcome measurements

The outcome measurements of interest were defined as follows; intellectual impairment (full scale IQ or GQ < 70), borderline intellectual impairment (full scale IQ or GQ 70–79), academic underachievement (achievement score greater than one standard deviation beneath full scale IQ). For comparison, data were obtained from Education Queensland identifying the prevalence of intellectual impairment in children attending state schools who resided in the same suburbs that study patients lived. These prevalence data were drawn from figures obtained for the year patients were recruited to our study. For the CBCL and TRF, children were regarded as having problems if their T-scores were in the clinical range for each respective behavioural/emotional category.

Statistics

Descriptive statistics were used to quantify the prevalence of intellectual, learning and behavioural/emotional problems in the population based on the questionnaire responses and psychometric assessments. The clinical utility of the PEDS questionnaire as a screening tool was assessed by determining its' sensitivity, specificity and predictive values for identifying children with the outcome measures above.

Statistical analysis was performed using SPSS 10 for Windows.

RESULTS

Over the 12-month study period, 85 children were referred to the CPU with alleged sexual abuse. Thirty-four children and their families were determined eligible for enrolment and invited to participate in the study. Of these, 21 children (62%) completed psychometric assessments and questionnaires, of whom 20 children were over 4 years of age. Allegations were

Table 1 Characteristics of study population

Female	18/21 (86%)
Mean age at referral	7.7 years (range 5 months–15 years)
Socio-economic status (No. families with welfare benefit as sole income source)	7/21 (33%)
Mean age of onset of abuse	6.0 years (range 5 months–14 years)
Alleged penetrative acts:	
Male	3/5 (60%)
Female	12/16 (75%)
Physical abnormality on genital examination	3/21 (14%)
Abuse in family/relatives home	19/21 (90%)
Abuse continuing for at least 6 months	10/21 (48%)
Relationship of abuser: [†]	
Step father	10/21 (48%)
Other male relative/friend	9/21 (43%)
Father	5/21 (24%)
Mother	2/21 (10%)
Female babysitter	2/21 (10%)
Unknown male	1/21 (5%)
Intergenerational abuse:	
Mother/step mother	13/21 (62%)
Father/step father	7/21 (33%)
History of illicit drug use:	
Mother/step mother	12/21 (57%)
Father/step father	7/21 (33%)

[†]Six children had more than one abuser.

later substantiated by Department of Families investigations in 18 of 21 (85%) children. Table 1 gives the clinical characteristics, Table 2, the psychometric assessment scores and Table 3, the questionnaire responses for these children.

Three of the 21 children (14%) were identified as having intellectual impairment and three (14%) as showing academic underachievement. Of these six children, one child with mild-moderate intellectual impairment was attending a special education unit. The other five children were not receiving learning support. Of the remaining 15 children tested, a further three were identified as receiving learning support. Of the 13 eligible children who did not attend for assessment, one had mild intellectual impairment and attended a special education unit and one other was also receiving learning support. Therefore, at least 11 of 34 (32%) children eligible for the study had intellectual impairment, academic underachievement or were receiving additional learning support. The 2001–02 prevalence of intellectual impairment for children from the suburbs where study children lived varied between 0.9 and 2.5% (Education Queensland pers. comm., 2002). Comparative data were not available for academic achievement.

Table 2 Psychometric responses

	Mean (range)
Verbal IQ	95.5 (57–128)
Performance IQ	98.4 (62–133)
Full scale IQ	96.6 (55–127)
Reading achievement	97.0 (72–119)
Mathematical reasoning achievement	94.2 (71–122)
Spelling achievement	93.5 (70–118)
Intellectual impairment:	
Mild-moderate	1/21
Borderline	2/21
Achievement problems:	
Under achievement	3/21

The CBCL was completed for all 21 children and the TRF for 15. Parents consistently reported higher levels of problem behaviours than the child's teacher for all categories. Thirteen children (62%) had scores in the clinical range on the CBCL, with the mean number of problems per child being 2.1. Attention problems and delinquent behaviours were most prevalent. Five children (33%) had scores in the clinical range on the TRF, with a mean number of problems per child of 0.5. The correlation between teacher and parent reported problem behaviours varied considerably, with externalizing problems generally showing higher correlations. Interestingly, attention problems scores showed a very low correlation.

A positive PEDS screen produced a test sensitivity of 64% and specificity of 60%. The positive predictive value was 77%.

DISCUSSION

The study examined the prevalence of intellectual impairment and academic underachievement in a population of Australian children referred for sexual abuse assessment. The results demonstrate a prevalence of intellectual problems beyond that seen in the general population. Nearly one third of children eligible for enrolment in the study had intellectual impairment, academic underachievement or were receiving learning support from their school.

The results of this study are consistent with those previously published with respect to mean IQ and achievement scores. Mannarino and Cohen described a mean IQ of 93 in 45 sexually abused children.²⁸ Basta reported on 32 sexually abused children and found significantly lower verbal IQ scores compared with control children, although results were still in the average range.²⁹ Sadeh *et al.* identified a mean IQ of 92 in a sample of 49 sexually abused children admitted to a psychiatric hospital.³⁰ There was a statistically significant difference only in performance IQ scores between abused and non-abused children, however, all scores lay within the average range. With regards to achievement, Shapiro *et al.* found that abilities in 53 sexually abused inner city girls were commensurate with their

Table 3 Questionnaire responses

	Withdrawn		Somatic complaints		Anxious/depressed		Social problems		Thought problems		Attention problems		Delinquent behaviour		Aggressive behaviour	
	CBCL	TRF	CBCL	TRF	CBCL	TRF	CBCL	TRF	CBCL	TRF	CBCL	TRF	CBCL	TRF	CBCL	TRF
Mean t score	60.3	56.5	60.8	54.4	61.6	56.7	61.2	59.7	62.3	52.8	65.9	59.9	62.2	57.9	64.4	62.0
No. in clinical range (%)	4/21 (19)	1/15 (7)	6/21 (29)	0/15 (0)	3/21 (14)	0/15 (0)	5/21 (24)	1/15 (7)	5/21 (24)	1/15 (7)	8/21 (38)	1/15 (7)	8/21 (38)	2/15 (13)	5/21 (24)	2/15 (13)
Correlation	-0.25		0.39		0.31		0.55		0.11		0.05		0.70		0.59	

IQ scores, the mean of which was estimated as 82.³¹ Kinard reported in 195 maltreated children of whom one third had been sexually abused, that achievement scores were more likely to be in the lower quartile than for control children.³² Einbender, in a study of 46 sexually abused girls demonstrated lower cognitive abilities and achievement scores than controls, though mean scores were still in the average range.³³ Unfortunately, these studies did not report the actual prevalence of intellectual problems and academic underachievement, the importance of which may be missed if mean scores only are considered. This study found over one in four children to have such problems. This is in line with recent work by Frothingham *et al.* who reported educational problems in 24% of 140 sexually abused children followed up over 8 years.²¹ Their figure represented an almost five-fold increase over controls.

The PEDS demonstrated a lower sensitivity and specificity than previously reported, although numbers were too small to draw definite conclusions from. Glascoe has previously shown, in a predominantly community based sample, an overall test sensitivity of 75%, specificity 74% and positive predictive value 37%.²⁷ Interrater reliability, test-retest reliability and internal consistency were reportedly high, as was correlation with diagnostic measures of development. The advantage of the PEDS over other developmental screening tests is that it can be self-administered and takes only 2 minutes to complete and score. Whilst the positive predictive value of the PEDS screen in our sample was high, this is likely to be due to the sample being a referred population with a higher prevalence of developmental and behavioural problems than would be seen in the community sample previously studied. There are no published data known to us documenting the clinical utility of the PEDS in referred populations of abused children. Its use as a screening test in children referred for sexual abuse requires validation in a larger series.

The prevalence of CBCL defined problems was high. The CBCL has been used widely in CSA research with results indicating that parents generally rate their children as more disturbed than non-clinical children, but no more pathological than clinical comparison groups.²⁰ Previous reviews of studies using the CBCL have demonstrated similar prevalence rates.^{3,20} The largest proportion of children with problems in the clinical range comprised attention problems. Eiraldi *et al.* reviewed the evidence on the construct and discriminant validity of the CBCL in relation to structured interviews and found the CBCL valid for discriminating children with attention deficit/hyperactivity disorder (ADHD) from those without.³⁴ ADHD and post-traumatic stress disorder (PTSD) are the most commonly diagnosed disorders in sexually abused children and are often comorbid.³⁵ PTSD itself may lead to failures in behavioural and emotional self-regulation, which manifest as externalizing disorders such as ADHD.¹² To complicate matters further, there is considerable overlap in symptomatology between these two diagnoses. The distinction is important as misdiagnosis may lead to inappropriate treatment. Thus, PTSD should always be considered in the differential diagnosis of ADHD in sexually abused children.

Correlation between teacher and parent reported symptoms were highly variable. The proportion of children with problems and mean scores were substantially less on the TRF than the CBCL. Whilst few studies have compared the TRF and CBCL in CSA, this finding supports previous work.^{36,37} Children's behaviour may vary considerably in different settings for many reasons. Parental reporting of problems may itself be influenced by other factors such as parental psychopathology and familial dysfunction. Clinicians therefore should always collect data from a variety of sources.

Limitations

The study examined only those children referred for sexual abuse evaluation. As many abused children are not referred, the results may not be representative of the sexually abused population in its entirety.³⁸ A major limitation in this study was the small sample size. Selection bias may occur, because in most cases of CSA, there is no perpetrator who admits guilt or witness to corroborate the alleged abuse. However, in over 85% of cases, allegations were later substantiated by other government agencies. Selection bias can also occur from loss to follow up. This is common in CSA populations. Familial dysfunction is the major predictor of non-participation in child sexual abuse research, although there is little published literature on the topic.³⁹ When examining predictors for attrition from children's mental health services in general, familial dysfunction, socioeconomic disadvantage, young and single parents and minority groups show increased risk of early loss to follow up.^{40,41} Of the 13 families who failed to re-attend for assessment, only one family refused to participate and one other relocated interstate. The others did not attend multiple appointments or were simply not contactable. Poverty and social disadvantage are known to be associated with lower levels of academic functioning and achievement.^{16,42} Poverty is also strongly implicated in child maltreatment although the relationship is less clear for CSA, where parenting style and relationship conflict are thought to be stronger predictors.^{43,44} With this in mind, our prevalence rates may be underestimates, if poorer and more dysfunctional families were lost to follow up. The Griffiths General Quotient (GQ) has been shown to have a weak correlation with IQ at school-age. Because only one child had a Griffiths assessment performed and the result of this was normal, misclassification is unlikely to have influenced results. The outcome measures of intelligence and achievement may have been affected by testing children suffering from psychological sequelae of the abuse. Testing occurred at least 1 month after the initial presentation and in a different location to minimize this effect.

Clinical implications

The clinical implications of developmental disorders in children subjected to CSA are significant for several reasons. First, impaired levels of intellectual functioning and academic achievement place a child at greater risk for school failure and subsequent mental health problems, especially when these difficulties are not recognized. These difficulties may compound the adjustment of children post-CSA. Second, such children may actually be at greater risk for subsequent abuse as a result of their inability to disclose or act protectively. Third, these difficulties may also negatively impact on treatment strategies. Further research is therefore required to develop our understanding of the relationship between childhood developmental disorders and CSA.

In taking an holistic approach to the assessment and management of sexually abused children, consideration must therefore be given to a child's developmental status. We propose that clinicians working in this field should have a high index of suspicion for comorbid intellectual problems and academic underachievement. They must also be aware of other potential causes of attention problems, such as PTSD, particularly when information is obtained from a single source only. The use of the PEDS questionnaire in screening such children requires validation in a larger study.

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