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Review article

Gender differences in the prevalence of childhood sexual abuse and in the development of pediatric PTSD

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Summary

Despite an extensive literature on the links between childhood sexual abuse (CSA) and posttraumatic stress disorder (PTSD), our knowledge on the effects of gender in relation to the risks for sexual victimization and subsequent PTSD is limited. We review current knowledge of gender differences in prevalence of CSA and the role of gender in subsequent development of child and adolescent PTSD with specific attention to rates, phenomenology, biological correlates, and risk factors. Despite the heavy bias toward female representation in studies, the literature supports increased rates of CSA and heightened vulnerability to PTSD in girls, as well as possible gender differences in the biological correlates and psychiatric sequelae of CSA. Further work is needed to explore the mechanisms that underlie these differences.

Keywords: Sexual abuse; gender differences; posttraumatic stress disorder; PTSD.

Introduction

Childhood sexual abuse (CSA) is alarmingly prevalent in both female and male children and adolescents. An extensive literature and numerous reviews have advanced our understanding of this complex field (Beitchman et al., 1991, 1992; Bremner, 2003; Finkelhor, 1990). However, relatively little attention has focused on the impact of gender on the prevalence of CSA and on its psychiatric sequelae, including posttraumatic stress disorder (PTSD). This may partly reflect the fact that the majority of existing research has focused on sexually abused girls and women. Drawing together the literature that addresses the role of gender in these areas would seem justified.

Several reasons have been cited for the emphasis in the literature on CSA in girls: first, boys are less likely to disclose their abuse (Browne and Finkelhor, 1986; Finkelhor et al., 1990; Knopp, 1986); second, boys are more likely to be discrepant (rather than consistent) reporters of sexual abuse (Lipschitz et al., 1999); third, the severity of abuse of boys is often underestimated; fourth, there is an assumption that boys are less adversely affected than girls (Garnefski and Diekstra, 1997); and fifth, boys may interpret sexually abusive behaviours as not abusive due to various socialisation processes (Widom and Morris, 1997). Nevertheless, there is growing recognition of CSA in boys (Beitchman et al., 1991, 1992; Friedrich, 1988) and its long term effects (Kendall-Tacket et al., 1993).

This review discusses some of the problems within CSA research with respect to definition and methodology and then reviews gender differences in the prevalence of sexual abuse, and rates, phenomenology, and risk for developing PTSD during childhood and adolescence. We conducted a MEDLINE search for studies published up until the end of 2002 using relevant keywords entered as search terms (child, childhood, adolescent, trauma, sexual abuse, PTSD, gender). In addition we reviewed reference lists of published articles. The review concentrates on and directly compares studies specifically assessing gender differences in CSA and the development of child and adolescent PTSD. The selected articles were all published between 1980 and 2002 in peer reviewed journals.

CSA prevalence

1 Definitional and methodological problems

CSA has been defined as ''contact or interaction between a child and an adult when the child is used for the sexual stimulation of an adult or another person'' (National Center for Child Abuse and Neglect, 1981). This definition also encompasses ''an act committed by another minor when that person is either significantly older than the victim (often defined as more than 5 years) or when the perpetrator is in a position of power or control over the child'' (National Center for Child Abuse and Neglect, 1981).

Nevertheless, there is wide variation in definitions of childhood sexual abuse, with studies differing in terms of the how sexual behaviour is defined, whether or not noncontact sexual events are included, whether or not wanted sexual experiences are included, whether an age differential between perpetrator and victim is set, and the upper age limit of the child (Goldman and Padayachi, 2000; Haugaard, 2000; Peters et al., 1986; Wyatt and Peters, 1986a, 1986b). A review of 149 studies on sexual abuse from 1985 to 1997 (Holmes and Slap, 1998) noted that in excess of 30 different methods of history-taking and criteria requirements were applied.

Discrepancies in definitions of child sexual abuse have made the accurate assessment of prevalence of CSA and subsequent psychopathology especially problematic (Browne and Finkelhor, 1986). Wyatt and Peters (1986a) demonstrated the impact that definition has on prevalence rates by re-computing the prevalence rates obtained in their earlier probability study using the more restrictive criteria imposed by researchers in three other studies. This resulted in overall prevalence dropping by at least 8%. Similarly, Roosa et al. (1998) created eight measures of sexual abuse and found that incidence rates within their large community sample varied between 59% and 18%.

Other methodological issues also impact on prevalence rates of CSA and related psychopathology (Goldman and Padayachi, 2000; Peters et al., 1986; Wyatt and Peters, 1986b). These include sampling techniques (probability vs non-probability), sample characteristics which include age group, socioeconomic and ethnic composition; method of data collection (face-to-face, telephonic interviews or self-report questionnaires); and the number and type of questions used to elicit information about sexual abuse experiences (i.e. one or more broad questions vs multiple questions about specific types of abuse) (Goldman and Padayachi, 2000; Peters et al., 1986; Wyatt and Peters, 1986b). The historical context of the study may play a role in prevalence rates; conducting research during a period when the problem of CSA is widely publicised may result in apparently higher prevalence as respondents might be more willing to disclose their abuse experiences (Goldman and Padayachi, 2000).

2 Gender differences in the prevalence of CSA

In an extensive review of the prevalence of CSA, Peters et al. (1986) reported that the prevalence of CSA ranged from 6% to 62% for girls and 3% to 31% for boys. More recent large sample studies (>1000 subjects) have consistently reported higher prevalence rates in girls (5.8% to 34%) than in boys (2% to 11%) (Table 1). A community sample of more than one hundred and twenty two thousand individuals documented CSA rates of 8% in girls and 2% in boys (Harrison et al., 1997). Boney-McCoy and Finkelhor (1995b) reported rates of 15% in girls and 6% in boys in a nationally representative sample of 10 to 16 year olds who were interviewed telephonically. Silverman et al. (1996) found CSA was 11 times more likely in females than males from a representative community sample. A survey of 1265 high school students in the central city areas of Denver (Colorado) and Cleveland (Ohio) reported similar gender ratios for both cities: 16% of girls versus 5% of boys in Denver and 16% of girls versus 7% of boys in Cleveland (Singer et al., 1995). In the National Comorbidity Survey, CSA was reported by 13.5% of women and 2.5% of men (Molnar et al., 2001).

While some variability in prevalence rates continues to be documented in recent studies (Table 1), the range is smaller than in the earlier studies reviewed by Peters et al. (1986). This may be explained by greater methodological consistency in the more recent studies. All used large (>1000 subjects) probability samples of secondary school pupils and anonymous self-report questionnaires with the exception of one study (Fergusson et al., 1996) where private interviews were conducted. Despite methodological similarity, persistent differences in the operational definitions of CSA between studies may account for some of the differences in prevalence rates. The different rates may also reflect true differences in the occurrence of CSA among different populations in different geographical locations.

Studies outside the U.S. using large representative school based samples have, similarly, documented significantly higher rates of sexual abuse in girls compared

Table 1. Prevalence of child sexual abuse: gender differences

Study	Participants (n)	Methods	Age	Girls	Boys
Boney-McCoy and Finkelhor (1995b) *USA*	n = 2000	Screening questions: 6 on non-sexual abuse, 6 on sexual abuse	10–16 years	15,3%	5,9%
Singer et al. (1995) (Denver, Colorado) *USA*	n = 1265	Survey design Anonymous questionnaire (self report)	14–19 years	16,2%	4,6%
Singer et al. (1995) (Cleveland City, Ohio) *USA*	n = 1228	Survey design Anonymous questionnaire (self report)	14–19 years	16,3%	7%
Fergusson et al. (1996) *New Zealand*	n = 1019	Private interviews on a range of mental health issues	18 years	17,3%	3,4%
Halperin et al. (1996) *Switzerland*	n = 1116	Anonymous questionnaire on sexual activities (self report)	13–17 years	33,8%	10,9%
Garnefski and Diekstra (1997) *The Netherlands*	n = 12 599	Questionnaire based on Monitoring the Future questionnaire (self report)	12–19 years	5,8% < 15 years 13,5% > 16 years	2,5% < 15 years 2,1% > 16 years
Harrison et al. (1997) *USA*	n = 122 824	Minesota Student Survey (self report)	12–18 years	8%	2,2%
Edgardh and Ormstad (2001) *Sweden*	n = 1943	School based survey Anonymous questionnaire (self report)	17 years	7,1%	2,3%
Sariola and Uutela (1994) *Finland*	n = 7349	School based survey Anonymous questionnaire (self report)	15–16 years	8%	3%
Choquet et al. (1997) *France*	n = 8140	School based survey Anonymous questionnaire on rape and various health behaviours (self report)	mean age = 16,2 years (SD = 2,02)	0,9%	0,6%
Madu and Peltzer (2000) *South Africa*	n = 414	Anonymous questionnaire (self report)	mean age = 18,5 years (SD = 2,18)	18,8%	15,1%

with boys (Table 1). These include studies in Holland (Garnefski and Diekstra, 1997), Finland (Sariola and Uutela, 1994, 1996), France (Choquet et al., 1997), New Zealand (Fergusson et al., 1996), Sweden (Edgardh and Ormstad, 2000), and Switzerland (Halperin et al., 1996), pointing toward the universality of this phenomenon. A South African study (Madu and Peltzer, 2000) found particularly high rates of CSA (53.2% in females and 56% in males), but this was based on a very small sample (N = 414), and when the rates were re-calculated to include only penetrative acts, the prevalence rates dropped to 18.8% for females and 15.1% for males (Madu and Peltzer, 2000).

While all of the school based survey studies have included male respondents, it is possible that there are gender-specific factors in data collection and definition of abuse that affect the prevalence rates obtained from male respondents (Urquiza and Keating, 1990). Boys are, for example, less likely to disclose their abuse (Browne and Finkelhor, 1986; Finkelhor et al., 1990; Knopp, 1986). Watkins and Bentovin (1992) have emphasized a number of prevalent myths about sexual abuse of male children and adolescents. One of these is that boys are hardly ever victims of abuse, or that the frequency of abuse is far less than that of girls. According to Pierce and Pierce (1985) other myths involve the notion that boys do not need protection from CSA as they are often judged in terms of their ''toughness'', in contrast to the ''vulnerability'' of girls.

Some of the reasons why boys are less likely to disclose their abuse may include shame about their perceived lack of power and masculinity and fear of being labelled homosexual (Nasjleti, 1980). Boys are also less likely to be consistent reporters of sexual abuse (Lipschitz et al., 1999) and due to various socialisation processes may interpret sexually abusive behaviours as not abusive (Widom and Morris, 1997). According to Holmes et al. (1997), boys may be less likely to label their childhood sexual activity with an older individual as abusive because boys often respond in a sexual manner (erection/ejaculation). This may contribute to their perception that the abuse was something they desired

and/or encouraged. Finally, there is an assumption that male victims are less adversely affected than female victims (Garnefski and Diekstra, 1997).

Consequences of CSA

1 Psychological

In response to CSA, boys and girls may display a wide range of psychological outcomes and an increased risk for developing psychiatric disorders. Certainly, there are differences in the way that sexual behaviour is experienced, and outcomes are not necessarily negative (Rind et al., 1999). Furthermore, CSA often occurs as part of a larger syndrome of childhood adversities so that conclusions from single-adversity single-disorder disorders should be cautiously drawn (Kessler et al., 1995). Nevertheless, psychological outcomes of CSA often include low self-esteem, guilt, self-blame, delinquency, substance abuse, impaired sexual functioning, and vulnerability to repeated victimization (Alexander, 1992; Beitchman et al., 1992; Browne and Finkelhor, 1986; Finkelhor, 1990; Finkelhor and Browne, 1988).

In general, girls are more likely to manifest internalising behaviors (e.g. depression, anxiety, posttraumatic stress, suicidal ideation) compared with boys after CSA (Feiring et al., 1999; Friedrich, 1988). It has been suggested that certain coping styles in girls, for example, a tendency to focus on negative mood, may make them more vulnerable to internalising behaviors (Nolen-Hoeksema et al., 1993). In contrast, boys are more likely to display externalising behaviors (oppositional behavior, aggression, impulsivity, substance abuse) (Beitchman et al., 1991; Green, 1988; Kashani and Carlson, 1987; Kendall-Tackett et al., 1993). Similarly, girls may experience more sexual anxiety while boys may exhibit higher levels of eroticism after CSA (Feiring et al., 1999; Watkins and Bentovim, 1992).

In relation to personality traits in adult victims of CSA, Rosen and Martin (1998) found that negative femininity was associated with CSA histories in adult men, but not in women. The authors speculate on the association between sexual abuse and negative femininity leading to gender identity difficulties in men. In adult female victims of CSA, frequency and not severity of abuse was associated with positive femininity (empathy, understanding, wanting to please and being hardworking). Nevertheless, not all studies demonstrate differences in behavioural problems or personality traits across gender after CSA (Tebbutt et al., 1997), so that conclusions in this area remain somewhat tentative.

2 Psychiatric

For both sexes, early CSA is associated with elevated lifetime rates of adjustment, mood, anxiety, attention-deficit hyperactivity, oppositional defiant, eating, substance use, conduct, borderline personality, and somatization disorders (McLeer et al., 1994; Merry and Andrews, 1994; Roesler and McKenzie, 1994; Stein et al., 1988). In the National Comorbidity Study, when other childhood adversities were controlled for, significant association were found between CSA and subsequent onset of 14 mood, anxiety and substance use disorders in women, and 5 among men. In a subsample of respondents reporting no other adversities, odds of depression and substance problems associated with CSA were higher (Molnar et al., 2001). In women, rape (vs molestation), knowing the perpetrator (vs strangers), and chronicity of CSA (vs isolated incidents) were associated with higher incidence of some disorders.

A population-based sample of 1411 adult female twins (Kendler et al., 2000) found that any CSA was associated with major depression, generalized anxiety disorder, panic disorder and substance dependence. This association was explained by more severe forms of CSA and not by background familial factors or parental psychopathology. In another population based sample of men and women aged 15–64 years, MacMillan et al. (2001) found the risk of lifetime risk of psychiatric disorders was increased by a history of CSA for both men and women. In women there was a significant relationship between sexual abuse and all disorders, while in men the only significant association was between sexual abuse and alcohol abuse/dependence (MacMillan et al., 2001). Dinwiddie et al. (2000) demonstrated strong associations with depression and suicidal ideation in sexually abused men and women, but higher rates of conduct disorder and alcohol dependence in males and of social phobia in females.

In a cross-sectional study of 151 boys and 594 girls with a self-reported history of CSA and 745 matched students without a CSA history (Garnefski and Diekstra, 1997), sexually abused boys had considerably more emotional and behavioral problems including suicidality than their female counterparts. Suicidality was reported 4.8 times more often by sexually abused girls than by non-abused girls, and 10.8 times more often by sexually abused boys than nonabused boys while controlling for the presence of concurrent physical abuse of boys.

Taken together, the data suggests that the risk of psychiatric sequelae following abuse is significantly related to the abuse per se and is not just a consequence of other associated factors (Stevenson, 1999). Although CSA clusters with other childhood adversities, it is possible to partly separate out the effects of CSA from other adversities (Molnar et al., 2001). For example, a study by Wind and Silvern (1994) showed that the experience of sexual abuse itself was related to later PTSD symptoms, while depression and low self-esteem were most closely related to experiences of a lack of parental warmth. Women survivors of CSA appear to be at risk for a particularly wide range of psychiatric disorders. An especially important consequence of CSA is pediatric PTSD; this will be discussed in the next section.

CSA and PTSD

1 Gender and rates of PTSD (Table 2)

In studies that have not drawn comparisons between males and females, rates of pediatric PTSD range between 36% (Darves-Bornoz et al., 1998) and 50% (Gianconia et al., 1995) after CSA. Relatively few studies have reported separate PTSD rates for sexually abused girls and boys. Ackerman et al. (1998) documented PTSD symptoms in 35% of sexually abused girls compared with 20% of boys. Cuffe et al. (1998) found PTSD rates of 32% for girls (n = 25) and no PTSD in boys (n = 4) in a small sample who had been sexually abused. A community survey with adult respondents found 9% of women and 0% of men who had experienced CSA to have full or partial PTSD at the time of the study (Stein et al., 2000). A fairly consistent finding is the two to six times higher risk of developing PTSD in traumatised girls compared with boys (Boney-McCoy and Finkelhor, 1995a; Cuffe et al., 1998; Giaconia et al., 1995). For example, Boney-McCoy and Finkelhor (1995a) found that female gender was a significant independent predictor of PTSD and accounted for 19% of the variance in PTSD-related symptomatology ($p < .01$). A community sample (Giaciona et al., 1995) of traumatised adolescents found females to be as frequently and as severely traumatised as their male counterparts. Females, however, were exclusively the victims of rape which conferred a seven-fold increased risk of expressing full criteria for PTSD. Other work has similarly found that sexual abuse in girls is associated with a higher risk for PTSD than other kinds of trauma in this population (Wolfe et al., 1989).

Overall, these studies suggest that girls may be at greater risk for PTSD following CSA than boys and that this higher risk is conferred independently by both female gender and sexual abuse. Some studies, however, have failed to demonstrate gender differences in rates of PTSD following CSA (Merry and Andrews, 1994; Silva et al., 2000). In a meta-analysis of studies published between 1984 and 1995, gender was not found to mediate the effects of CSA on: (i) PTSD, (ii) depression, (iii) suicide, (iv) sexual promiscuity, (v) poor academic performance, and (vi) the victim-perpetrator cycle (Paolucci et al., 2001). It is not clear how many males were compared with females in terms of PTSD rates in this meta-analysis. Inconsistent findings about the impact of gender may reflect a number of differences related to study design including differing definitions of abuse and methodologies, and

Table 2. Prevalence of PTSD in sexually abused children and adolescents: gender differences

Study	Method	Participants (n)	Age	PTSD
Ackerman et al. (1998)	Diagnostic Interview for Children and Adolescents (DICA) revised version (DSM-III-R)	girls = 100 boys = 27	7–13 years	girls = 35% boys = 22%
Cuffe et al. (1998)	Present Episode version of the KSADS (DSM IV)	girls = 25 boys = 4	16–22 years	girls = 32% boys = 0%
Stein et al. (2000)	Modified PTSD Symptom Scale (MPSS) (DSM-IV)	female = 126 male = 26	18 years and older	females = 9% males = 0%
Silva et al. (2000)	Children's Structured Clinical Interview for DSM IV (KID-SCID)	girls and boys = 13	3–18 years	15% no significant gender difference
Merry et al. (1994)	Semi-structured interview (DSM III-R). Parents interviewed with Diagnostic Interview Schedule for Children (DISC-2)	girls = 55 boys = 11	4–16 years	girls = 18.2% boys = 18.2%

Table 3. Risk factors for PTSD following CSA

Significant risk factors ($p < 0.5$)	Age	Study	Sample	Instruments
Multiple trauma/ prior victimization	10–16 years	Boney-McCoy and Finkelhor (1995a)	girls = 958 boys = 1042	modified version of Symptom Check-list-90 & Revised (SCL-90 – R) (No formal DSM)
	7–13 years	Ackerman et al. (1998)	girls = 131 boys = 73	revised Diagnostic Interview for Children and adolescents (DICA) (DSM-III-R)
	13 years and older mean age = 21 years	Darves-Bornoz et al. (1998)	73 girls and women	Structured interview for PTSD (DSM-IV)
	12–21 years	Lipschitz et al. (2000)	90 girls	Child PTSD Checklist (DSM-IV)
	6–16 years	Ruggiero et al. (2000)	girls = 65 boys = 15	epidemiological version of the Schedule for Affective Disorders and Schizophrenia for School Age Children (K-SADS-E) (DSM-III)
Gender = female	10–16 years	Boney-McCoy and Finkelhor (1995a)	girls = 958 boys = 1042	modified version of Symptom Check-list-90 & Revised (SCL-90 – R) (No formal DSM)
	18 years	Giaconia et al. (1995)	girls = 190 boys = 194	NIMH Diagnostic Interview Schedule (DSM-III-R)
	16–22 years	Cuffe et al. (1998)	girls = 26 boys = 4	present episode version of the Schedule for Affective Disorders and Schizophrenia for School-Age Children (K-SADS) (DSM-IV)
Severity of sexual assault/penetration or attempted penetration	10–16 years	Boney-McCoy and Finkelhor (1995a)	girls = 958 boys = 1042	modified version of Symptom Check-list-90 & Revised (SCL-90 – R) (No formal DSM)
	18 years	Giaconia et al. (1995)	girls = 190 boys = 194	NIMH Diagnostic Interview Schedule (DSM-III-R)
	16–31 years CSA < 16 years	Briggs and Joyce (1997)	73 girls and women	Hopkins Symptom Checklist (SCL-90) (DSM-III)
Child feared death/ Serious injury/threatened	10–16 years	Boney-McCoy and Finkelhor (1995a)	girls = 958 boys = 1042	modified version of Symptom Check-list-90 & Revised (SCL-90 – R) (No formal DSM)
	16–31 years CSA < 16 years	Briggs and Joyce (1997)	73 girls and women	Hopkins Symptom Checklist (SCL-90) (DSM-III)
	13 years and older mean age = 21 years	Darves-Bornoz et al. (1998)	73 girls and women	Structured interview for PTSD (DSM-IV)

limitations of sample-size particularly the use of very small male sub-samples (Nurcombe, 2000).

2 Gender and risk factors for PTSD (Table 3)

Although not all children develop psychopathology in the aftermath of trauma, a substantial proportion (20% to 90%) of children and adolescents develop PTSD following CSA (Nurcombe, 2000). To date, however, limited information is available on the role of gender as a risk factor for the development of psychopathology in general, and PTSD in particular. Gender differences have been demonstrated in the development of PTSD following non-sexual trauma (Oates et al., 1994; Rosenham, 2002; Wolfe et al., 1994). We have previously noted the relative bias of females in research samples and the over-representation of sexual abuse in these samples, suggesting that many of these differences may result from the higher attributive value given to the causal relationship between sexual abuse and PTSD (Kaminer et al., 2000).

Consistently documented risk factors for pediatric PTSD after CSA include characteristics of the abuse, family characteristics, and individual child factors. Risk factors related to characteristics of CSA include (i) longer duration and increased frequency of abuse (Kendall-Tackett et al., 1993; Ruggiero et al., 2000), (ii) more invasive acts of abuse e.g. genital penetration (Boney-McCoy and Finkelhor, 1995a; Briggs and Joyce, 1997; Giaconia et al., 1995), (iii) fear of death or serious injury (Boney-McCoy and Finkelhor, 1995a), (iv) threat of harm

(Boney-McCoy and Finkelhor, 1995a; Briggs and Joyce, 1997; Darves-Bornoz et al., 1998), (v) prior victimization (Boney-McCoy and Finkelhor, 1995a; Darves-Bornoz et al., 1998), and (vi) added physical abuse (Ackerman et al., 1998; Lipschitz et al., 2000; Ruggiero et al., 2000).

Family factors such as parental conflict, parental psychopathology, impaired parent-child relationship and family disruption that operate prior to CSA or concurrently with CSA may also adversely affect outcome (Fergusson et al., 1996; Friedrich, 1988). The degree to which the family offers support once the abuse has been disclosed may also mediate psychological outcomes in a child (Friedrich, 1988). Child-specific factors include age at onset of abuse. While younger age at abuse onset has been associated with worse outcome (Wolfe et al., 1989), other studies have found no link between PTSD related symptomatology and age at onset of abuse (Boney-McCoy and Finkelhor, 1995a). Wolfe et al. (1989) found the child's attributional style to be a further mediating variable in the risk for PTSD and related symptomatology. A self-deprecatory style was linked to worse social competence. Stable attributions about the abuse were linked to higher levels of negative affect, intrusive thoughts and feelings of betrayal and stigmatisation.

It is possible that gender mediates these risk factors in various ways. Abusers of girls are more likely to be family members whereas abusers of boys are likely not to be relatives (Finkelhor et al., 1990). Intra-familial abuse is more likely to be of longer duration because the family is often involved in keeping the abuse a secret. Children who experience intra-familial abuse tend to have a more intimate relationship with the offender which increases their risk of psychopathology (Beitchman et al., 1991; Browne and Finkelhor, 1986; Kendall-Tackett et al., 1993). Children sexually abused by adults who are substantially older than the child tend to experience more psychological distress (Finkelhor et al., 1990; Briere and Runtz, 1993). Finkelhor et al. (1990) noted a smaller age difference between boys and their offenders, compared with girls and their offenders. Boys are however more likely to be victims of both physical and sexual abuse (Hussey et al., 1992) and are more likely to experience significant force during the abusive act (Pierce and Pierce, 1985), which may contribute to increased psychological distress. Socialization factors (Kaminer et al., 2000) may be important in the higher rates of PTSD in girls as girls may be more likely to disclose their symptoms than boys. Also, girls are more inclined to blame themselves or be blamed following sexual victimization.

3 Gender and PTSD phenomenology

PTSD is a disorder of complex and variable phenomenology and a number of studies has highlighted gender differences. Sexually abused children generally appear to display more re-experiencing, avoidance, and hyperarousal phenomena compared with physically abused and non-abused populations (Deblinger et al., 1989). Girls experience higher levels of intrusive thoughts and hyperarousal symptoms compared to boys, but equivalent levels of avoidance symptoms (Feiring et al., 1999). Kolko et al. (1988) in a retrospective hospital chart review found that females had higher scores on variables of sexual behaviour and fear/anxiety, however, no gender effects emerged on the symptom checklist administered to caregivers.

4 Neurobiological correlates of CSA

Neurobiological investigation of the relationship between CSA and adult-onset PTSD and depression have generally focused on brain circuits and systems that mediate the stress response (Bremner, 2003). Considerably fewer studies have examined the neurobiological correlates of CSA in children and adolescents and there has been scant examination of gender differences. Further, findings to date have been both varied and contradictory.

Studies have reported both increases and decreases in basal cortisol levels, urinary catecholamine secretion, heart rate responses, and adrenocorticotropin (ACTH) hormone secretion in response to exogenous corticotropin-releasing hormone (CRH) (Kaufman, 1996). For example, one study (Putnam et al., 1991) documented hypersecretion of cortisol in sexually abused girls recruited within six months of disclosure compared with non-abused socio-demographically matched controls. In another study low salivary cortisol levels in girls who had been sexually abused within recent months were found (King et al., 2001).

De Bellis and colleagues (1994a) found that sexually abused girls (58% of whom had histories of severely depressed mood with suicidal behavior and only one of whom had PTSD), had significantly greater 24-hour urinary concentrations of catecholamines and their metabolites compared with non-abused controls. There was attenuated plasma ACTH responses to CRH in a subsample of sexually abused girls studied several years after

disclosure (De Bellis et al., 1994b), consistent with impaired hypothalamic-pituitary-adrenal (HPA) axis function. In a follow-up study, prepubertal maltreated children with PTSD (83% of whom had PTSD secondary to sexual abuse) were found to excrete greater concentrations of baseline 24-hour urinary catecholamines than non-traumatized children with overanxious disorder and controls. Urinary epinephrine and norepinephrine excretion was higher in males than females, and urinary free cortisol concentrations also showed a trend for higher levels in males (De Bellis et al., 1999a).

The first imaging study conducted in maltreated children and adolescents with PTSD (77% of whom experienced PTSD secondary to sexual abuse) documented smaller intracranial and cerebral volumes in children with PTSD than matched controls (De Bellis et al., 1999b). Brain volumes were strongly correlated with age of onset of abuse (positively) and duration of abuse (negatively). Notably, abused males with PTSD demonstrated greater evidence of adverse brain development (e.g. greater corpus callosum and enlarged lateral ventricular volume) than abused females, suggesting that males may be more vulnerable to the effects of severe trauma on brain development than females. In contrast to the decrease in hippocampal volumes seen in female adult survivors of childhood sexual abuse (Stein et al., 1997; Bremner et al., 1997; Bremner et al., 2003), there has been a failure to find hippocampal volume reduction in abused children and adolescents with PTSD.

Conclusion

Gender and CSA

CSA is a serious and prevalent problem, with prevalence estimates in most studies ranging between 5.8% and 34% in girls and 2% and 11% in boys. To date the majority of research has focused on female survivors of sexual abuse, and male CSA survivors have been underrepresented, and possibly under-identified as victims (Urquiza and Keating, 1990). The wide variation in definition hampers comparison of findings, and results in disparate prevalence rates of both CSA and subsequent psychopathology (Roosa et al., 1998). Methodological issues including sampling techniques and sample type may also impact upon prevalence rates of CSA and related psychopathology (Goldman and Padayachi, 2000; Peters et al., 1986; Wyatt and Peters, 1986b).

Despite these caveats, the findings of recent large population based studies in both the USA and elsewhere using adolescent respondents show that CSA affects a significantly larger number of girls than boys. While the body of literature on CSA has grown in recent years, future studies need to pursue standardized definitions and methodologies for obtaining sexual abuse histories. Furthermore, to effectively examine the similarities and differences in potential outcomes of CSA in child and adolescent populations studies need to be more gender-representative.

Gender and PTSD

Studies reviewed here have highlighted that rates for PTSD are higher in girls and women with CSA histories and that female gender appears to be an independent risk factor for the development of pediatric PTSD following CSA. After CSA, gender appears to affect the development of either externalising or internalising behaviours and impacts on the biologic abnormalities seen in pediatric PTSD, with gender differences in whole and regional brain volumes apparently indicating differential responses to severe abuse.

To answer more specific questions about the impact of gender on the response to CSA, additional data is required. Despite the summary findings above, inconsistency remains in the literature with respect to the role of gender in risk of CSA and subsequent PTSD (rates, phenomenology and biological correlates). In relation to risk for psychopathology following CSA, it would seem that multiple trauma-related factors (frequency, nature, relationship to perpetrator, unexpected nature, social network etc.) independent of gender, increase risk for PTSD. In general CSA appears to be more prevalent among females and in turn seems to have a higher attributive risk for subsequent pediatric PTSD. This possibility coupled with the gender biases in sampling needs to be addressed in future work.

The preliminary brain imaging and neurochemical data in this field may help to explain some of the inconsistencies between adult and child and adolescent studies. Long-lasting biological sequelae of severe trauma, as demonstrated by persistent HPA axis dysfunction in abused girls years after reporting severe abuse, has been demonstrated (De Bellis et al., 1999b). Prospective community research which includes current methods in neurogenetics and neuroimaging may be able to uncover the links between inherited factors, CSA and other environmental adversities, and the complex responses to trauma including pediatric PTSD. Such an understanding may ultimately contribute to more

effective preventative and treatment strategies for survivors of CSA.

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