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Child maltreatment as a risk factor for opioid dependence: comparison of family characteristics and type and severity of child maltreatment with a matched control group

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Abstract

Objective—To examine the prevalence, characteristics and risk factors for child maltreatment among opioid-dependent persons compared to a community sample of similar social disadvantage.

Method—The study employed a case-control design. Cases had a history of opioid pharmacotherapy. Controls were frequency matched to cases with regard to age, sex and unemployment and were restricted to those with a lifetime opioid use of less than five times. The interview covered child maltreatment, family environment, drug use and psychiatric history.

Results—This study found a high prevalence of child maltreatment among both cases and controls. Despite the elevated prevalence among controls, opioid-dependent males had a higher prevalence of physical and emotional abuse; female cases had a higher prevalence and greater severity of sexual abuse. The prevalence of neglect was similar for both groups. Early parental separation was more prevalent among female cases compared to female controls; otherwise the prevalence of the risk factors was comparable for both groups. The risk factors significantly associated with child maltreatment were also similar for both cases and controls.

Conclusions—Given the documented association between child maltreatment and adult mental disorder, child maltreatment may be an important antecedent of current psychological distress in persons presenting to treatment for opioid dependence. Apart from a possible association between early parental separation and sexual abuse among female cases, the increased prevalence of child maltreatment associated with opioid-dependence did not appear to be related to differences in early childhood risk factors considered in this paper. Other risk factors may be more pertinent for those with opioid dependence.

Practice Implications—The high prevalence of child maltreatment among the opioid-dependent sample has implications for the assessment and treatment of clients presenting with opioid dependence. Assessment of child maltreatment history could help inform the development of individual treatment plans to better address those factors contributing to the development and maintenance of opiate dependence. Specifically, management of co-morbid mental disorder associated with child maltreatment could be the focus of relapse prevention programmes and also have a positive influence on treatment retention.

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Introduction

Child maltreatment is associated with a range of negative outcomes (Andrews, Corry, Slade, Issakidis, & Swanston, 2004; Fergusson, Horwood, & Lynskey, 1996; Fergusson & Lynskey, 1997; Kendler, Bulik et al., 2000; Kessler, Davis, & Kendler, 1997; Nelson et al., 2006; Nelson et al., 2002; Oddone Paolucci, Genuis, & Violata, 2001). Child maltreatment is thought to disrupt normal development leading to problems of self-definition and emotion regulation and consequently, increased risk of mental disorder (Cicchetti & Lynch, 1995; Maughan & Cicchetti, 2002). Population estimates for sexual abuse range from 14–34% among women and 3–16% among men (Briere & Elliot, 2003; Molnar, Buka, & Kessler, 2001). In contrast, the prevalence of physical abuse appears to be similar for males and females, with 22% of males and 20% of females experiencing physical abuse in the US general population (Briere & Elliot, 2003). Population prevalence studies of neglect and emotional abuse are limited, however a study across four developed nations found prevalence of emotional abuse to be 12% and neglect to be 4% (Cohen et al., 2006). A national representative sample of young adults aged 18–24 years in the United Kingdom found the prevalence of emotional abuse was 4% among males and 8% among females. The rate of physical neglect was similar for males (6%) and females (7%).

The risk of problems associated with child maltreatment appears related to the characteristics of the abuse experienced. Numerous studies have shown greater severity and an earlier onset of child maltreatment is associated with poorer outcome (Bifulco, Moran, Baines, Bunn, & Stanford, 2002; Briere & Elliot, 2003; Clemmons, Walsh, DiLillo, & Messman-Moore, 2007; Lynskey & Fergusson, 1997; Molnar et al., 2001; Thornberry, Ireland, & Smith, 2001). Additionally, both the duration and frequency of child maltreatment have been shown to influence risk for negative outcome. For example, Briere and Elliot (2003) mailed questionnaires including the Trauma Symptom Inventory (TSI) to a random sample of US residents. They found higher TSI scores were associated with having experienced a greater number of incidents of sexual or physical abuse and being older when the last incident of sexual or physical abuse occurred (possibly suggesting longer duration of abuse). This is consistent with the idea that cumulative trauma is associated with incremental risk for mental disorder (Breslau, Chilcoat, Kessler, & Davis, 1999; Kendler, Thornton, & Gardner, 2000; Kessler et al., 1997).

Related to this, there is a high degree of overlap among maltreatment types and consistent evidence of a dose-response relationship between multiple exposure and risk for later psychopathology (Bifulco, Moran, Baines et al., 2002; Bolger & Patterson, 2001; Edwards, Holden, Felitti, & Anda, 2003; D. Higgins & McCabe, 2000; Mullen, Martin, Anderson, Romans, & Herbison, 1996). Whilst such evidence suggests the number of maltreatment types is important in conferring risk for adverse outcome, there is also evidence to suggest the risk for adverse outcome varies across the different types of child maltreatment. General population studies examining a range of outcomes confirm that sexual abuse imbues a general vulnerability for mental disorder (Andrews et al., 2004; Bulik, Prescott, & Kendler, 2001) whereas the impact of physical abuse may be more specific (Fergusson & Lynskey, 1997). Additionally, some forms of child maltreatment appear to be stronger predictors of negative outcome. For example, compared to other forms of maltreatment, emotional abuse has been found to be independently associated with mood and anxiety disorders (Cohen et al., 2006; Gibb et al., 2001; Sullivan, Fehon, Andres-Hyman, Lipschitz, & Grilo, 2006).

Child maltreatment and substance use

There is consistent evidence that child maltreatment and drug use problems are associated. Research on substance use disorders within the general population has revealed a higher prevalence among those with a history of child maltreatment (Molnar et al., 2001; Saunders,

Kilpatrick, Hanson, Resnick, & Walker, 1999). Twin studies examining sexual abuse have also demonstrated increased risk of drug use problems, over and above that construed by genetic and familial risk factors (Kendler, Bulik et al., 2000; Nelson et al., 2006; Sartor et al., 2007). High rates of child maltreatment have been documented among both community and treatment samples of drug users (Medrano, Hatch, Zule, & Desmond, 2002; Simpson & Miller, 2002).

Studies examining child maltreatment among those with opioid dependence specifically are few. Among a psychiatric inpatient sample, a history of sexual and/or physical abuse was associated with opioid use (Heffernan et al., 2000). Opioid use was most common among those with sexual abuse and/or physical abuse, compared to those with a history of sexual abuse alone. In an Australian study examining post-traumatic stress disorder among opioid-dependent persons, 22% of males and 52% of females had experienced sexual abuse during childhood (Mills, Lynskey, Teeson, Ross, & Darke, 2005).

Bartholomew and colleagues (Bartholomew, Courtney, Rowan-Szal, & Simpson, 2005; Bartholomew, Rowan-Szal, Chatham, Nucatola, & Simpson, 2002) examined child maltreatment among a sample of opioid-dependent women commencing opioid replacement therapy (ORT). Women with a history of sexual abuse were significantly more likely to have also experienced physical and emotional abuse, had a higher prevalence of comorbid mental health problems, elevated rates of use of other depressant drugs (such as cannabis and benzodiazepines), and were more likely to report psychological reasons for using drugs compared to women without a history of sexual abuse.

Risk factors for child maltreatment

Child maltreatment is multiply determined (Belsky, 1993; Cicchetti & Lynch, 1995). Some of the risk factors identified by previous research include social disadvantage (Gillham, Tanner, & Cheyne, 1998; Knutson, DeGarmo, & Reid, 2004; Shook Slack, Holl, McDaniel, Yoo, & Bolger, 2004), parental substance use (Fergusson & Lynskey, 1997; Fergusson, Lynskey, & Horwood, 1996; Kelleher, Chaffin, Hollenberg, & Fischer, 1994; Vogeltanz et al., 1999), poor parent-child relationships (Fergusson, Lynskey et al., 1996; Fleming, Mullen, & Bammer, 1997; Howes & Cicchetti, 1993; McLaughlin et al., 2000), lack of a confidante during childhood and adolescence (Bromet, Sonnega, & Kessler, 1998; Fleming et al., 1997; Mullen et al., 1996), conflict between caregivers (Bagley & Mallick, 2000; Gaudin, Polansky, Kilpatrick, & Shilton, 1996; McGuigan & Pratt, 2001), and household composition (Fergusson & Lynskey, 1997; Stiffman, Schnitzer, Adam, Kruse, & Ewigman, 2002; Swanston et al., 2002).

The above risk factors are also highly prevalent in the early family environment of persons who have developed opioid dependence (Bailey, Hser, Hsieh, & Anglin, 1994; Glavak, Kuterovac-Jagodic, & Sakoman, 2003; Vaillant, 1966). It is plausible to contend that differences in the prevalence of child maltreatment among general population and problematic substance use samples may be driven by differences in the prevalence of these early environmental risk factors. Moreover, as the impact of child maltreatment is an ongoing transaction between the individual and their physical and social environments, these risk factors may also exert significant influence on the sequelae of child maltreatment (Cicchetti & Toth, 1997; D. J. Higgins, McCabe, & Ricciardelli, 2003; Zielinski & Bradshaw, 2006).

Aims of the current study

Opioid dependence is a significant concern in Australia: over 30,000 persons were in opioid replacement therapy for heroin dependence as at June 2005 (Black, Roxburgh, & Degenhardt, 2007). Clients typically present to treatment with extensive social problems and high comorbidity of psychiatric disorders (Ross et al., 2005) that contribute to poor retention and

treatment outcome (Tate, Brown, Unrod, & Ramo, 2004). Child maltreatment may be an important antecedent to the complex presentations in this population: clients with a history of child maltreatment have greater psychiatric comorbidity upon presentation to treatment (Bartholomew et al., 2002; Ouimette, Kimerling, Shaw, & Moos, 2000).

Most research on child maltreatment and substance dependence has tended to focus on sexual and physical abuse, to the exclusion of the less well-specified types of neglect and emotional abuse. This is an important limitation, particularly when long-term outcomes are being considered, as there is a substantial degree of overlap in the experience of different types of child maltreatment (Edwards et al., 2003; D. Higgins & McCabe, 2000; Scher, Forde, McQuaid, & Stein, 2004). Although there is a general consensus regarding the types of behaviours that constitute sexual and physical abuse, research has been impeded by differences in the way in which these forms of maltreatment have been operationalised. Both the depth and phrasing of the assessment appear to be important drivers in the disparate prevalence estimates found across studies.

This study aims to document the prevalence, characteristics and risk factors of four types of child maltreatment (sexual abuse, physical abuse, neglect, and emotional abuse) among an Australian sample of opioid-dependent persons and additionally, to compare their experience of child maltreatment to a community sample of similar social disadvantage. This study extends previous research by:

- a. Collectively examining four types of child maltreatment;
- b. The use of detailed, objective questioning to ascertain child maltreatment;
- c. Separate analysis of the prevalence and risk factors for child maltreatment among males and females; and
- d. Comparison of findings with a control group of similar social disadvantage and matched for age, gender and employment.

Method

Design

This study is part of a larger project examining the interaction between genes and the environment in the development of opioid dependence. It employs a matched case-control design where non-opioid-dependent controls are frequency matched to opioid-dependent cases on age, gender and employment status. Given that social disadvantage is a significant risk factor for child maltreatment, associations between child maltreatment and opioid dependence may simply reflect the highly disadvantaged early environment of persons with opioid dependence. Thus, the matching of opioid-dependent cases to a non-opioid-dependent control sample of similar social disadvantage enables inferences to be made regarding the association of child maltreatment and opioid dependence in particular.

Subjects

Subjects were 967 opioid-dependent cases (mean age 36.5yrs; 61% male; 84% unemployed; 51% 10yrs or less education) recruited from opioid pharmacotherapy clinics across the greater Sydney metropolitan region and 346 non-opioid-dependent controls (mean age 34.7yrs; 45% male; 54% unemployed; 15% 10yrs or less education) recruited through advertisements in street press, community centres, unemployment centres and public spaces such as train stations and shopping plazas. Participation in the study was voluntary. Recruitment took place between November 2005 and February 2007. All respondents were screened to determine eligibility. Cases were required to have been enrolled in a pharmacotherapy program as clinical

determination of opioid dependence forms part of this assessment process. Controls who reported a lifetime history of five or more incidents of opioid use were excluded from the study. Controls were frequency matched to cases in terms of age, gender and employment status. Participants reporting recent suicidal intent, those that were psychotic, or did not have an adequate grasp of English, were excluded from the study. Participants who presented substance-affected at the time of their appointment were rescheduled for another time. Opioid-dependent cases were significantly more likely to be male (aOR=1.8, 1.4–2.4), unemployed (aOR=3.2, 2.4–4.3) and less educated (aOR=4.7, 3.4–6.6) compared to non-opioid-dependent controls. There was no evidence of a difference in mean age between cases and controls. Compared to non-opioid-dependent controls, opioid-dependent cases had a similar prevalence of alcohol dependence but a higher prevalence of all other illicit drug classes.

Procedure

Ethics approval was obtained from the University of New South Wales Human Research Ethics Committee, the Washington University School of Medicine Human Subjects Committee, the Queensland Institute of Molecular Research Ethics Committee and the various Area Health Service ethics committees governing each of the clinics where recruitment took place. Participants provided written consent prior to participation. All measures were administered via a computerized, structured interview conducted face-to-face by trained interviewers. Participants who became distressed during the interview were referred to their case manager or counselor or to a relevant community service. Participants were reimbursed AUD\$50 at the completion of the interview.

Measures

Child maltreatment was defined in terms of sexual abuse, physical abuse, emotional abuse and neglect. These categories of maltreatment were chosen because they mapped well to the items collected as part of the larger project. The four maltreatment types were not mutually exclusive; participants could be classified with multiple types of child maltreatment. All incidents were reported to have occurred before the age of 18 years. The questions for sexual abuse and physical abuse were taken from the Christchurch Health and Development Study (Fergusson, Horwood, Shannon, & Lawton, 1989). Sexual abuse included 10 items asking about non-contact, contact and penetrative sexual abuse. Physical abuse included 13 items asking about physical assault from a caregiver or injury arising from a caregiver's actions towards the participant. Neglect was based on Strauss' conceptualisation of neglect as four subtypes - physical, emotional, supervisory and cognitive neglect (Strauss, 2006). Five items from the main study were identified and mapped to three of the subtypes - physical, emotional and supervisory neglect. Emotional abuse was measured with one item assessing verbal insult. For neglect and emotional abuse, participants were asked if the item occurred not at all, occasionally or frequently. Frequency measures for sexual abuse were measured as a continuous variable and later dichotomized as single or multiple incidents because of the bimodal distribution of the data. Duration (rather than frequency) was measured for physical abuse. In addition, age of onset, and relationship of the perpetrator to the participant were collected for incidents of sexual abuse and physical abuse.

Six early environmental risk factors were identified for inclusion in this study: (i) early parental separation defined as occurring before the age of seven; (ii) lifetime excessive or problematic substance use by a parent as reported by the participant; (iii) verbal or physical conflict between parents or between a parent and a live-in partner whilst the participant was growing up; (iv) maternal relationship before the age of 18 years reported by the participant as being either close/very close or not close/very distant; (v) paternal relationship before the age of 18 years (reported as per maternal relationship); and (vi) existence of a support person (someone to go to for emotional support when upset) whilst growing up.

Data analysis

Multiple regression analysis (using backward selection) was undertaken to compare opioid-dependent cases and non-opioid-dependent controls in relation to the prevalence, characteristics and risk factors for the four types of child maltreatment measured. Because data collection for the main project is continuing, there is incomplete matching of cases and controls in the current sample; therefore, age, sex, education and employment status were included as covariates in all analyses. In addition, there was a high level of substance dependence among non-opioid-dependent controls for some drug types. Therefore, three variables – alcohol dependence, cannabis dependence, other illicit drug dependence – were included as covariates in all analyses. Alpha level was set at $p=.05$ for all analyses. Results are reported in terms of odds ratios and 95% confidence intervals for categorical outcomes, and t-tests for continuous outcomes.

Results

The prevalence of sexual abuse, physical abuse, emotional abuse and neglect among opioid-dependent cases and non-opioid-dependent controls is shown in Table 1. Categorical variables were analysed using logistic regression and results reported in terms of odds ratios and 95% confidence intervals; continuous variables were analysed using linear regression and results reported in terms of t-values. All analyses were adjusted for demographic variables and dependence on alcohol and other illicit drugs to better characterise case-control differences specific to opioid dependence.

The prevalence of sexual abuse among the opioid-dependent cases was substantial: 72% among females and 36% among males. Among females, opioid-dependent cases were significantly more likely than controls to experience penetrative sexual abuse, multiple incidents of sexual abuse and for the abuse to be perpetrated by someone known to them. In contrast, the experience of sexual abuse among males was similar for opioid dependent cases and non-opioid dependent controls. The only exception was age of onset: compared to male controls, male cases were significantly younger when their first incident of sexual abuse occurred.

The prevalence of physical abuse among opioid-dependent cases was similar for males and females (58% and 59%, respectively). Physical abuse was significantly more prevalent (58% vs 36%; aOR=1.6, CI 1.0–2.4) and had a later onset (8yrs vs 7yrs; $t=2.0$, $p<.05$) among opioid-dependent males compared to male controls. There was no difference between female cases and controls with regard to either the prevalence or characteristics of physical abuse.

The prevalence of emotional abuse among opioid-dependent cases was 47% for males and 60% for females. Opioid-dependent males had a higher prevalence of frequent emotional abuse, compared to non-opioid-dependent males (27% vs 12%; aOR=1.9, CI 1.0–3.4). There was no evidence of a difference in prevalence of emotional abuse between female cases and controls.

Neglect was highly prevalent among opioid-dependent cases (68% and 78% for males and females, respectively). This high prevalence appeared to be reflected primarily in the prevalence of frequent emotional neglect. For both males and females, there was no evidence of a difference in prevalence of any subtype of neglect between cases and controls.

Exposure to more than one maltreatment type was common. Among males, 65% of opioid-dependent cases and 49% of non-opioid-dependent controls experienced two or more types of maltreatment. Among females, multiple types of maltreatment were experienced by 68% of opioid-dependent cases and 66% of non-opioid-dependent controls.

Six known risk factors for child maltreatment were examined: early parental separation, parental substance use, parental conflict, maternal relationship, paternal relationship and having a support person. Table 2 shows the proportion of opioid-dependent cases and non-opioid-dependent controls reporting each of the risk factors. Parental conflict was the most common risk factor for both males and females, followed by poor paternal relationship and parental substance use. Overall, cases and controls appeared to have experienced similar rates of risk factors with the exception of female cases who had a higher prevalence of early separation from a biological parent compared to female controls (38% versus 24%; aOR=1.9, CI 1.1–3.1).

Multiple regression analysis (using backward selection) was used to assess the relationship between the risk factors and each of the four types of child maltreatment. The significant risk factors are shown in Table 3. The pattern of risk factors for sexual abuse differs to the overall pattern observed for the other child maltreatment types. Early parental separation was a significant risk factor for both males and females; a poor paternal relationship was an additional risk factor for sexual abuse among males. With regard to the remaining types of maltreatment the risk factors were similar: parental conflict, poor maternal and paternal relationships, and lack of a support person whilst growing up, were significant predictors for both males and females (although the association between poor paternal relationship and emotional abuse was significant among males only for opioid-dependent cases). Early parental separation was an additional risk factor for physical abuse among females whereas parental substance use was an additional risk for neglect among males.

Discussion

To our knowledge, this is the largest and most comprehensive study of child maltreatment among an opioid-dependent sample. The rate of child maltreatment in the present study was high: 72% of opioid-dependent females had experienced sexual abuse and 68% of opioid-dependent males had a history of neglect. Opioid-dependent cases experienced greater severity of some types of child maltreatment – sexual abuse among female cases was typically severe, chronic, and perpetrated by someone known to them. The prevalence of the risk factors for child maltreatment was high, particularly parental conflict (75–76%) and poor paternal relationship (58–59%). Parental conflict and the three relationship factors were significant predictors of child maltreatment except for sexual abuse, which was primarily associated with early parental separation. There were elevated rates of some types of child maltreatment among opioid-dependent cases, compared to non-opioid-dependent controls. In addition, there were differences between males and female cases in the types of child maltreatment that were elevated.

The differences between males and females is consistent with previous research demonstrating a higher sex ratio for sexual abuse but not physical abuse (Briere & Elliot, 2003; Fergusson & Mullen, 1999). Compared to male controls, male cases had similar risk for sexual abuse and neglect, and greater risk for physical and emotional abuse. In contrast, female cases had a greater risk for sexual abuse only. Clearly, there is no consistently elevated risk across the different types of child maltreatment for opioid-dependent males and females.

Compared to general population studies, the prevalence of child maltreatment within the sample was high, even when the comparison is restricted to the most severe and chronic forms of maltreatment. Among opioid-dependent females, approximately half experienced sexual abuse involving penetration. This is of significant clinical concern given the strong evidence that greater severity of sexual abuse is associated with a higher risk for mental disorder (Andrews et al., 2004; Briere & Elliot, 2003; Bulik et al., 2001; Molnar et al., 2001; Saunders et al., 1999).

Approximately half of the opioid-dependent sample had a history of emotional and physical abuse; other studies have similarly found opioid dependence and physical and emotional abuse to be strongly associated (Bartholomew et al., 2002; Heffernan et al., 2000). Additionally, the prevalence of neglect among opioid-dependent cases is substantial, particularly the rate of emotional neglect (66% for males and 76% for females). Although the measurement of emotional abuse and neglect was less comprehensive, the results of the present study suggest these forms of maltreatment may carry similar risk to the oft-studied maltreatment types of sexual and physical abuse. Future research with this population could make use of existing child maltreatment questionnaires that provide a more comprehensive assessment of emotional abuse and neglect.

Overall, the prevalence of child maltreatment was similar for opioid-dependent cases and non-opioid-dependent controls. This finding may be due to the high rate of other drug dependence among the control sample and suggests that child maltreatment may be associated with substance dependence in general, rather than opioid dependence in particular. One mechanism by which child maltreatment and substance dependence may be related is through the disruption of self-system processes leading to problems in impulse control, affect regulation and threat appraisal, among others. Animal and human studies suggest early life stress can impart lasting changes on neurobiological systems underpinning these self-system processes, particularly those that modulate stress responsivity (Caldji, Diorio, & Meaney, 2000; Heim, Newport, Bonsall, Miller, & Nemeroff, 2001).

Despite the high prevalence of substance dependence in the control sample, there remains a significant increase in the rate of some types of child maltreatment among opioid-dependent cases. These particular forms of child maltreatment – physical and emotional abuse among males, and sexual abuse among females – may confer additional risk for the development of opioid dependence in particular. Moreover, the elevated rates of sexual abuse and emotional abuse among opioid-dependent cases was reflected in elevated rates of the most severe and chronic forms of these maltreatment types. The risk of substance dependence may therefore be differentially related to child maltreatment depending on both the type and severity of maltreatment experienced. Specificity in the association of child maltreatment and drug dependence has previously been noted in an Australian twin sample where sexual abuse was most strongly related to dependence upon opioids and benzodiazepines (Nelson et al., 2006). Such an association has implications for future research using prospective designs with young people.

Early parental separation may be an important risk factor for child maltreatment among female cases. This risk factor was significantly associated with sexual abuse and physical abuse among females. Compared to female controls, a greater proportion of opioid-dependent females were separated from a biological parent at an early age. Related to this, the sexual abuse of female cases was more severe, more frequent and more often perpetrated by someone known to them, compared to female controls.

In general though, the higher prevalence and greater severity of some types of child maltreatment experienced by the opioid-dependent cases does not appear to be driven by differences in the risk factors for child maltreatment compared to non-opioid dependent persons. A similar pattern of risk factors was found for both cases and controls and the prevalence of the risk factors was also comparable for both groups. In particular, parental conflict and a poor paternal relationship were highly prevalent among both opioid-dependent cases and non-opioid-dependent controls. The high prevalence of early childhood risk factors among the non-opioid-dependent control sample may explain the limited extent to which opioid-dependent cases and non-opioid-dependent controls differed in the prevalence of the four types of child maltreatment.

It is possible the opioid-dependent cases may be vulnerable because of other early environmental risk factors not included in the present study. The mental health of a parent and the quality of their social networks have been identified as important correlates of child maltreatment in previous research (Bifulco, Moran, Ball et al., 2002; Ethier, Lacharite, & Couture, 1995; Fleming et al., 1997). Likewise, parenting characteristics (Shook Slack et al., 2004; Vogeltanz et al., 1999) and the temperament and physical health of the child (Bagley & Mallick, 2000; Ethier et al., 1995; Wilson, Kuebli, & Hughes, 2005) have also been shown to be associated with child maltreatment. Additionally, the severity of the early environmental risk factors was not assessed in the present study and this might be a critical feature of the experience of risk among opioid-dependent cases. For example, the measurement of family conflict in the present study included any verbal or physical conflict, regardless of the consequences of the conflict (such as physical injury or having to flee the home for safety) or the frequency with which it occurred. Future work might explore these possibilities further.

Limitations

This study has a number of limitations. First, measurement of child maltreatment was retrospective and relied on self-report. While studies have shown adult recollection of child maltreatment to be inconsistent, this bias typically results in false negatives rather than false positives (Fergusson, Horwood, & Woodward, 2000; Hardt & Rutter, 2004). A key strength of the study is the inclusion of a control group of similar social disadvantage against which to compare the experience of child maltreatment among the opiate dependent sample. Presumably any effect of recall bias is consistent across both samples. Although there was incomplete matching of the control and case samples, demographic variables were included as covariates in all analyses.

Second, although this study is one of the first attempts to measure these forms of child maltreatment in an opioid-dependent sample, the measurement of neglect and emotional abuse was necessarily limited due to conflicting time demands within the interview. Future research could extend this study by examining a more complete set of items measuring neglect and emotional abuse, particularly with the achievement of greater consensus among researchers regarding the measurement of these forms of maltreatment.

Third, the present study was unable to measure all possible early environmental risk factors. Other risk factors (such as parental mental disorder) may better differentiate opioid-dependent cases and non-opioid-dependent controls in terms of their risk for child maltreatment. The study also did not measure the severity or degree of exposure to each risk factor and this may also be an important correlate of child maltreatment risk. For example, parental substance use was a binary measure and thus did not discriminate as to whether a participant was exposed to maternal substance use, paternal substance use or both.

Finally, the study utilised a sample of opioid-dependent persons drawn from treatment centres across the greater Sydney region. The majority of opioid-dependent cases were enrolled voluntarily in ORT; a small proportion was enrolled in ORT as part of a drug-court programme. The sample may not be representative of those who have never sought treatment.

Conclusion

This study demonstrated a significant relationship between some types of child maltreatment and opioid dependence, even when the comparison group was a socially disadvantaged control group. By additionally controlling for the prevalence of other substance dependence among cases and controls, the findings of this study suggest some types of maltreatment may be specifically associated with opioid dependence. The pattern of risk associated with the four types of maltreatment differed for males and females: sexual abuse was more prevalent and

more severe among females whereas physical and emotional abuse was more prevalent among males. The relationship between child maltreatment and opioid dependence does not appear to be mediated by differences in the prevalence of several common risk factors.

Given the documented association between child maltreatment and adult mental disorder, child maltreatment may be an important antecedent of current psychological distress in persons presenting to treatment for opioid dependence. Assessment of child maltreatment history could help inform the development of individual treatment plans to better address those factors contributing to the development and maintenance of opioid dependence. Specifically, management of comorbid mental disorder associated with the trauma of child maltreatment could be the focus of relapse prevention programmes and also have a positive influence on treatment retention.

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Table 1
Child maltreatment among opioid dependent cases and matched non-opioid dependent controls, stratified by gender[#]

	Male			Female		
	(n=154) Control	(n=588) Case	Adjusted OR (95%CI)	(n=192) Control	(n=379) Case	Adjusted OR(95%CI)
Sexual abuse (%)	34.4	36.1	0.7 (0.5–1.1)	56.3	71.8	1.2 (0.8–2.0)
Penetrative (%)	15.6	21.4	1.0 (0.6–1.8)	27.6	56.2	2.0 (1.2–3.2)**
Contact (%)	9.7	7.3	0.7 (0.3–1.4)	12.0	10.3	1.3 (0.6–2.5)
<i>Among those with sexual abuse:</i>	(n=53)	(n=212)		(n=108)	(n=272)	
Mean age at first sexual abuse incident (yrs)	11.5	10.3	<i>t</i> =−2.1*	10.7	9.9	<i>t</i> =−1.8
Multiple incidents (%)	39.6	47.6	1.3 (0.6–2.9)	38.0	61.4	3.3 (1.8–6.2)***
Perpetrator known to victim (%)	64.2	67.9	1.3 (0.6–3.0)	65.7	80.1	3.0 (1.5–5.9)***
Physical abuse (%)	36.4	57.5	1.6 (1.0–2.4)*	42.7	58.8	1.1 (0.7–1.7)
<i>Among those with physical abuse:</i>	(n=56)	(n=338)		(n=82)	(n=223)	
Mean age at first physical abuse incident (yrs)	7.3	7.8	<i>t</i> =2.0*	7.9	8.0	<i>t</i> =1.2
Mean duration (yrs)	5.8	5.8	<i>t</i> =−1.0	5.3	6.1	<i>t</i> =0.3
Multiple perpetrators (%)	32.1	34.3	1.3 (0.7–2.6)	35.4	35.4	0.7 (0.4–1.4)
Emotional abuse (%)	33.8	46.4	1.2 (0.8–1.9)	47.9	59.9	0.9 (0.6–1.4)
Frequent (%)	11.7	26.5	1.9 (1.0–3.4)*	27.1	39.8	1.0 (0.6–1.6)
Neglect (%)	57.8	68.0	1.2 (0.8–1.8)	71.4	77.6	0.7 (0.4–1.3)
Frequent (%)	29.9	43.9	1.3 (0.8–2.0)	40.1	58.0	1.1 (0.7–1.8)
<i>Physical neglect (%)</i>	9.1	12.1	0.9 (0.4–1.7)	10.4	13.7	0.5 (0.3–1.1)
Frequent (%)	3.9	7.5	1.0 (0.4–2.7)	5.7	8.7	0.6 (0.2–1.4)
<i>Emotional neglect (%)</i>	57.1	65.5	1.1 (0.7–1.7)	70.3	75.5	0.7 (0.4–1.2)
Frequent (%)	28.6	41.5	1.3 (0.8–2.0)	37.0	55.7	1.2 (0.8–1.9)
<i>Supervisory neglect (%)</i>	22.1	34.9	1.3 (0.8–2.1)	31.8	43.8	0.8 (0.5–1.3)
Frequent (%)	11.0	20.2	1.4 (0.8–2.6)	20.3	29.3	0.8 (0.4–1.3)

p<.001**
p<.01

*

 $p < .05$

Multiple regression analysis controlling for age, education, employment, alcohol dependence, cannabis dependence, and other illicit dependence

Table 2

Proportion of opioid dependent cases and matched non-opioid dependent controls reporting each of the risk factors for child maltreatment, stratified by gender[#]

	Male			Female		
	(n=154) Control	(n=588) Case	Adjusted OR (95%CI)	(n=192) Control	(n=379) Case	Adjusted OR (95%CI)
Family factors						
Parental separation (before age 7) (%)	24.7	27.2	0.9 (0.6–1.5)	24.0	38.3	1.9 (1.1–3.1) *
Parental conflict (%)	72.1	74.7	1.0 (0.6–1.6)	74.0	76.0	0.8 (0.4–1.3)
Parental substance use (%)	29.2	42.2	1.5 (1.0–2.4)	41.7	53.0	1.2 (0.8–1.9)
Relationship factors						
Poor maternal relationship (%)	19.5	28.6	0.9 (0.5–1.5)	37.5	43.3	1.2 (0.8–1.9)
Poor paternal relationship (%)	46.1	57.7	0.8 (0.5–1.3)	54.2	58.8	0.9 (0.6–1.5)
No support person (%)	28.6	29.4	1.3 (0.8–1.8)	22.4	25.3	1.0 (0.6–1.8)

p<.001

**
p<.01

*
p<.05

[#] Multiple regression analysis controlling for age, education, employment, alcohol dependence, cannabis dependence, and other illicit dependence

Table 3
Risk factors for the four different categories of child maltreatment, stratified by gender[#]

	Sexual abuse	Physical abuse	Emotional abuse	Neglect
Early separation				
Male	1.7 (1.2–2.4) **			
Female	1.6 (1.1–2.4) *	1.6 (1.1–2.5) *		
Parental conflict				
Male		4.2 (2.9–6.4) ***	3.7 (2.4–5.6) ***	2.6 (1.7–3.8) ***
Female		5.6 (3.4–9.1) ***	3.2 (2.0–5.0) ***	2.5 (1.6–4.1) ***
Parental substance use				
Male				1.7 (1.2–2.5) **
Female				
Poor maternal relationship				
Male		1.8 (1.2–2.7) **	1.7 (1.2–2.5) **	3.3 (2.0–5.4) ***
Female		1.8 (1.2–2.7) **	2.5 (1.6–3.7) ***	4.2 (2.4–7.3) ***
Poor paternal relationship				
Male	1.7 (1.2–2.4) **	2.4 (1.7–3.4) ***	2.6 (1.2–5.9) * §	2.9 (2.0–4.1) ***
Female		2.1 (1.4–3.2) ***	2.5 (1.7–3.7) ***	3.6 (2.3–5.7) ***
No support person				
Male		1.8 (1.3–2.7) **	1.4 (1.0–2.1) *	1.9 (1.3–2.9) **
Female		2.7 (1.7–4.3) ***	1.8 (1.1–2.7) *	2.9 (1.5–5.5) **

 $p < .001$

**
 $p < .01$

*
 $p < .05$

[#] Multiple regression analysis controlling for age, education, employment, alcohol dependence, cannabis dependence, and other illicit dependence

§ significant interaction: subject status X poor paternal relationship