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Original article

Mediating role of borderline personality traits in the effects of childhood maltreatment on suicidal behaviour among mood disorder patients

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ABSTRACT

Background: Substantial evidence supports an association between childhood maltreatment and suicidal behaviour. However, few studies have examined factors mediating this relationship among patients with unipolar or bipolar mood disorders.
Methods: Depressive disorder and bipolar disorder (ICD-10-DCR) patients ($n = 287$) from the Helsinki University Psychiatric Consortium (HUPC) Study were surveyed on self-reported childhood experiences, current depressive symptoms, borderline personality disorder traits, and lifetime suicidal behaviour. Psychiatric records served to complement the information on suicide attempts. We examined by formal mediation analyses whether (1) the effect of childhood maltreatment on suicidal behaviour is mediated through borderline personality disorder traits and (2) the mediation effect differs between lifetime suicidal ideation and lifetime suicide attempts.
Results: The impact of childhood maltreatment in multivariate models on either lifetime suicidal ideation or lifetime suicide attempts showed comparable total effects. In formal mediation analyses, borderline personality disorder traits mediated all of the total effect of childhood maltreatment on lifetime suicide attempts, but only one fifth of the total effect on lifetime suicidal ideation. The mediation effect was stronger for lifetime suicide attempts than for lifetime suicidal ideation ($P = 0.002$) and independent of current depressive symptoms.
Conclusions: The mechanisms of the effect of childhood maltreatment on suicidal ideation *versus* suicide attempts may diverge among psychiatric patients with mood disorders. Borderline personality disorder traits may contribute to these mechanisms, although the influence appears considerably stronger for suicide attempts than for suicidal ideation.

1. Introduction

Childhood experiences correlate with adult physical and mental well-being [1,2]. The most adverse outcomes include associations of childhood maltreatment (CM) with premature death [3] and suicidal behaviour [4]. While research on suicide deaths remains scarce [5], considerable evidence shows an association between CM and suicidal ideation and attempts [4]. Although several previous studies have examined this relationship by estimating the effect of covariates in analyses, few studies have investigated potential mediating mechanisms [6–10].

Borderline personality disorder (BPD) ranks among the most prevalent personality disorder comorbidities among mood disorder patients [11,12]. Subthreshold BPD traits are even more common [13]. Within mood disorder samples, CM is associated with comorbid BPD diagnosis [14] and traits [15]. Aetiology of BPD is multifactorial, including both inherited vulnerabilities and developmental factors [16]. Family and twin studies of BPD demonstrate familial transmission and moderate heritability [17]. Psychological theories of development of BPD remark CM and dysfunctional parenting [18–20] as environmental factors.

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Although CM is neither sufficient nor necessary for the development of BPD [16], prospective studies show that children exposed to CM are at higher risk of developing BPD [21,22]. In cross-sectional studies, adult BPD patients report ample CM and dysfunctional parenting [23–25], and a dose-response relationship exists between CM and BPD symptoms [15,26,27].

Epidemiological and clinical cohort studies affirm connections between depression, hopelessness, and suicidal ideation. Progression to suicide attempts, by contrast, appears to be more associated with severity of depression, anxiety or agitation, and impaired self-control [28–31]. Dysregulation of emotions and impaired self-control characterize the core phenotype of BPD, together with unstable relationships and cognitive distortions/identity disturbance [32]. BPD, in turn, is a substantial risk factor for suicidal behaviour [33,34].

Suicidal ideation and acts are common among patients with mood disorders [28,30,31], and these patients constitute a high-risk group for suicide [35,36]. Our previous work [28] showed that among patients with mood disorder, risk factors for suicidal ideation and suicide attempts likely differ. Several putative remote risk factors may also influence this risk through more proximate clinical characteristics [28]. CM could explain the mutual association as a common denominator for both suicidal behaviour and BPD traits. In addition to dysregulation of emotions, however, affective lability is frequently present in mood disorders. The only previous study of which we are aware that investigated direct mediators between CM and suicidal behaviour in a clinical mood disorder sample showed mediation through affective lability in patients with bipolar disorder [37]. Other explanatory factors may include heritability of psychiatric disorders and impulsive-aggressive traits; tentatively interacting with familial recurrence of CM [38].

We investigated mediators between CM and suicidal behaviour within a psychiatric mood disorder patient cohort. We also modelled as confounders the effects of parental mental health and substance use. We hypothesized (a) BPD traits to be significant mediators between CM and suicidal behaviour, and due to impaired self-control, (b) BPD traits to demonstrate stronger mediating effects on suicide attempts than on suicidal ideation. Finally, we explored possible differences in mediating roles of specific forms of CM.

2. Methods

2.1. Setting

This study was executed within the mood disorder arm of the Helsinki University Psychiatric Consortium (HUPC) Study, a joint research project between the Faculty of Medicine, University of Helsinki; the Department of Psychiatry, Helsinki University Central Hospital; the Department of Health and the Mental Health Unit of the National Institute of Health and Welfare; and the Department of Social Services and Health Care, Psychiatric Services, City of Helsinki, Finland. The Ethics Committee of Helsinki University Central Hospital and the appropriate research committees approved the study design. A complete description of the HUPC study methodology is available elsewhere [28,39] and is briefly outlined below.

Participating regional units consisted of all 10 communal mental health centres, 24 of the 35 psychiatric inpatient wards, and one of the 8 day-care hospitals. The sampling was executed from 12th January 2011 to 20th December 2012. Patients were randomly drawn by stratified sampling method from regional units to generate representativeness. Every $\geq$ 18-year-old patient was considered eligible, excluding patients suffering from mental retardation or neurodegenerative disorders or possessing insufficient Finnish language skills.

2.2. Sampling

From the mood disorder units, a total of 904 patients were drawn and 784 were reached and invited to participate in the study; 375 declined participation and 336 completed the study (response rate 43%, 336/784). Excluding missing surveys and other principal lifetime diagnoses resulted in a final sample of 287 patients with either depressive disorder (n = 188) or bipolar disorder (BD) (n = 99). No significant differences emerged in age or gender when stratified by principal diagnosis and regional sampling relative to the patient population in the respective psychiatric services. For the description of the sample, see Table 1.

2.3. Lifetime principal diagnosis

The study diagnoses were formed by the clinical diagnoses assigned by the attending physicians and according to the International Statistical Classification of Diseases and Health Problems, 10th Revision (ICD-10), Diagnostic Criteria for Research. The authors (K.A., I.B., B.K., M.K.), however, carefully weighed the validity of the diagnoses by re-examining all available information from patient records and specified the diagnosis when needed. A lifetime principal diagnosis was hierarchically established by giving precedence to severe depressive, bipolar affective, and psychotic disorders. The BD diagnosis was subtyped according to the Finnish national treatment guidelines [40] into type I and II disorders.

2.4. Trauma and Distress Scale (TADS)

The TADS is a self-report questionnaire of childhood maltreatment and distressing experiences [41,42]. The 25 items of the scale measure five subdomains of CM, including physical, sexual, and emotional abuse, and emotional and physical neglect. The items of the scale inquire about gradually more severe experiences and rate the frequency of occurrence of each by a five-point Likert scale from 0 to 4 (0 = never, 1 = rarely, 2 = sometimes, 3 = often, 4 = nearly always). The TADS provides both subscales for each type of CM and, by adding the subscales, a sum score. The reliability between self-reported and interviewed TADS, and internal consistencies of the subscales indicate good psychometric properties in a Finnish community sample [43]. In our sample, Cronbach's alphas for the subscales ranged from 0.675 to 0.908, and for the sum score 0.924.

2.5. McLean Screening Instrument for Borderline Personality Disorder (MSI-BPD)

The MSI-BPD is a 10-item self-report screening instrument for borderline personality disorder (BPD), where each item rates true/false screening for the presence of BPD symptoms. The MSI-BPD shows good sensitivity (0.81) and specificity (0.85) with a clinical cut-off score of 7 or more, as well as good internal consistency (Cronbach's alpha = 0.74) [44], confirmed in a Finnish validation study [45]. In our sample, Cronbach's alpha was 0.753 and analyses were conducted by omitting the suicidality item to avoid content overlap.

2.6. Other assessments

Beck Depression Inventory (BDI) is a self-report instrument (21 items) for depressive symptoms [46]. In our sample, Cronbach's alpha for the scale was 0.923. The suicidality item in the analyses was omitted to avoid circularity.

The survey inquired about family history of mental health and substance abuse that had required treatment or caused significant

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