



Anomalous self-experience and childhood trauma in first-episode schizophrenia

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Abstract

Background: Anomalous self-experiences (ASEs) are viewed as core features of schizophrenia. Childhood trauma (CT) has been postulated as a risk factor for developing schizophrenia.

Aim: The aim of this study is to investigate the relationships between CT, depression and ASEs in schizophrenia.

Method: ASEs were assessed in 55 patients in the early treated phases of schizophrenia using the Examination of Anomalous Self-Experience (EASE) instrument. Data on CT were collected using the Childhood Trauma Questionnaire, short form (CTQ-SF). This consists of 5 subscales: physical abuse, sexual abuse, emotional abuse, emotional neglect, and physical neglect. Assessment of depression was based on the Calgary Depression Scale for Schizophrenia (CDSS).

Results: We found significant associations between EASE total score and CTQ total score and between EASE total score and emotional neglect subscore in women, but not men. We also found significant associations between CDSS total score and CTQ total score and between CDSS total score and emotional abuse, emotional neglect, and physical neglect subscores in women, but not men. In men we did not find any significant associations between EASE total score, CDSS total score and any CTQ scores.

Conclusion: CT was significantly associated with higher levels of ASEs in women in the early treated phases of schizophrenia, but not in men. This again associated with an increase in depressive symptoms.

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1. Introduction

Studies show that childhood trauma (CT) is associated with a wide range of psychiatric disorders [1] and has also been related to subclinical psychopathology in otherwise healthy adults [2]. CT has a profound impact on development; an impact that goes far beyond the increased risks for post-traumatic stress-disorders and related symptomatology. Studies also demonstrate that CT often is followed by identity problems, affect dysregulation, and relational disturbances [3].

CT also has a more long-lasting effect on the HPA axis, with subsequent stress-sensitivity, compared to trauma in adulthood or recent stressful events [4,5]. In addition to changes in the stress- and immune systems, CT has also been found to be associated with sensitization of the mesolimbic dopamine system and concomitant changes in brain structures such as the hippocampus and the amygdala [6–8], with clear indications of gene × environment interactions [9].

CT has repeatedly been postulated as a risk factor for developing psychotic disorders including schizophrenia [10–14], with a recent meta-analysis which included prospective case-control studies showing a modest but statistically significant odds-ratio [10]. Another meta-analysis which included retrospective studies also found a greater prevalence of CT among patients with a psychotic disorder than in the general population [15]. Trauma and

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bullying are also found to be more prevalent in persons with psychotic experiences than in healthy controls [16], and are related to increased levels of depression and anxiety and a poorer sense of self in this group, in addition to more perceptual disturbances [17,18]. The presence of CT has also been associated with specific clinical characteristics after onset of psychosis, including increased cognitive impairments, social dysfunction [19] and dissociative symptoms [20]. Most studies indicate that CT is more frequently present in women than in men, with suggestions that the impact of CT on later psychopathology is stronger in women [21] and with one study finding the association between CT and psychosis to only be present in women [22].

Profoundly altered basic self-experience in the form of characteristic non-psychotic disturbances of the basic sense of self is recognized as a core feature of schizophrenia [23]. Anomalous self-experiences (ASEs; i.e. disturbances of basic self-awareness or sense of self) aggregate in schizophrenia spectrum disorders [24–27], are present also in the prodromal stages [28,29] and might be predictive of conversion to psychosis in individuals at ultra high risk [30]. The phenomenological concept of the self refers to here-and-now experiences associated with implicit awareness, and in this context differs from self-concepts based on developmental theories including psychoanalytic—or self-psychological notions of the self. The phenomenological concept of the self has three hierarchical but interconnected levels: the narrative self, the reflective self and the pre-reflective self [31]. The narrative self refers to explicit experiences and recollections of the person as having specific characteristics such as personality, habits, style, and a personal history. The reflective self is a relatively explicit, cognitive awareness of the self as an invariant and persisting subject of experience and action; the presence of a relatively stable “I” over time. The pre-reflective self is the most basic level of self-awareness and refers to the first-person quality of a person’s experiences, i.e. the tacit awareness that this is “my” experience. This level of selfhood is fully implicit in—and inseparable from—the experience itself. ASEs are subjective experiences that include certain and subtle forms of depersonalization, anomalous experiences of cognition and stream of consciousness, self-alienation, pervasive difficulties in grasping familiar and taken-for-granted meanings, unusual bodily feelings, permeability or complete loss of the self-world boundary, in addition to existential reorientation [32]. These are fundamental distortions of the first-person perspective, including deficiencies in the sense of being a coherent subject or a self-coinciding center of action, thought and experience [33]. Phenomenology is focused on experiential phenomena and not on the search for underlying mechanisms or etiology. ASEs are from this perspective core features of schizophrenia, and thus carry the same complex etiology as the disease itself. Recent research has however addressed the pathogenic role of ASEs in schizophrenia [34], and the relationship between ASEs and underlying neuro-

biological disturbances [35–37], vulnerabilities and risk factors [35,36]. CT appears to have a pervasive effect on psychopathology, but as far as we know there is no research investigating the relationships between CT and ASEs in schizophrenia. This relationship is however of interest since CT, particularly in the form of emotional maltreatment, has been linked to the phenomenon of depersonalization in the otherwise healthy persons [38], while severe depersonalization can involve many experiences that resemble ASEs [39].

The main purpose of the current study was to explore the possible relationships between CT and ASEs in the early treated phases of schizophrenia. Our main hypothesis was that CT is related to high levels of ASEs in schizophrenia.

2. Material and methods

2.1. Design and sample

The current study is part of the Norwegian Thematically Organized Psychosis (TOP) Study [40]. The study involved all treatment facilities in two neighboring Norwegian counties (Hedmark and Oppland) with a county-wide population of 375,000 people. Inclusion criteria were age between 18 to 65 years, and being consecutive in- or outpatient referred to first adequate treatment for a *DSM-IV* diagnosis of schizophrenia spectrum psychosis (schizophrenia, schizophreniform disorder and schizoaffective disorder) in 2008 and 2009. Exclusion criteria were the presence of brain injury, neurodegenerative disorder, or intellectual disability. Patients with concurrent substance use disorders were included, but had to demonstrate at least 1 month without substance use, or clear signs that the psychotic disorder had started before the onset of significant substance use (i.e. did not meet the criteria for substance induced psychotic disorder).

A total of 55 patients early in their treatment course completed the full protocol including the Examination of Anomalous Self-Experience (EASE) interview [32] measuring ASEs. Coming to first adequate treatment was defined as not having previously received adequate antipsychotic medication (adequate doses for 12 weeks, or until remission), or any treatment at all. Some of the patients had not even initiated their first treatment at the time of inclusion. To enhance statistical power, we also included 11 patients consecutively enrolled in a closely related ongoing study of young psychosis patients born in 1985/86. They met the same inclusion and exclusion criteria except for the strict definition of first treatment. They were, however, in an early phase of their treatment course, with an even shorter duration of untreated psychosis (DUP) than the strict first treatment patients.

All participants gave written, informed consent to participate. The study was approved by the Regional Committee for Medical Research Ethics and the Norwegian Data Inspectorate.

2.2. Clinical assessments

Diagnoses were ascertained by two experienced psychiatrists using the Structural Clinical Interview for the Diagnostic and Statistical Manual of Mental Disorders, fourth edition (SCID-IV) [41]. Symptom severity and function were assessed using standard psychiatric measures including the Structured Clinical Interview for the Positive and Negative Syndrome Scale (SCI-PANSS) [42]. Duration of untreated psychosis (DUP) was measured as time from onset of psychosis (first week with a score of four or more on one of the of the PANSS subscale items: delusions, hallucinatory behavior, grandiosity, suspiciousness/persecution or unusual thought content). Assessment of depression was based on the Calgary Depression Scale for Schizophrenia (CDSS) [43]. Both raters completed the TOP study group's training and reliability program with SCID training based on and supervised by the UCLA training program [44]. For *DSM-IV* diagnostics, mean overall kappa for the standard diagnosis of training videos for the study as a whole was 0.77, and mean overall kappa for a randomly drawn subset of study patients was also 0.77 (95% CI 0.60–0.94). Intra class coefficients (ICC 1.1) for the other scales were: PANSS positive subscale 0.82 (95% CI 0.66–0.94), PANSS negative subscale 0.76 (95% CI 0.58–0.93), PANSS general subscale 0.73 (95% CI 0.54–0.90), and GAF-F 0.85 (95% CI 0.76–0.92).

2.3. Assessment of childhood trauma

Data on CT were collected using the Norwegian version of the Childhood Trauma Questionnaire, short form (CTQ-SF) [45]. This is a 28-item self-report inventory, developed and validated based on the original 70-item version [46], that provides a relatively short screening of maltreatment experiences before the age of 18. It comprises 28 items, yielding scores on 5 subscales of trauma: physical abuse, sexual abuse, emotional abuse, emotional neglect, and physical neglect. For estimates of *frequencies* of childhood trauma we used the moderate to severe predefined cutoff suggested by Bernstein [47] of ≥ 10 for physical abuse, ≥ 8 for sexual abuse, ≥ 13 for emotional abuse, ≥ 15 for emotional neglect, and ≥ 10 for physical neglect.

2.4. Assessment of anomalous self-experiences

ASEs were assessed using the EASE manual [32], comprising five domains: (1) Cognition and stream of consciousness. (2) Self-awareness and presence. (3) Bodily experiences. (4) Demarcation/transitivity. (5) Existential reorientation. This represents a wide variety of anomalous self-experiences condensed into 57 main items and scored on a 5-point Likert scale (0–4), in which 0 = absent; 1 = questionably present; 2 = definitely present, mild; 3 = definitely present, moderate; 4 = definitely present, severe. For the purpose of the analyses, the resulting scores were dichotomized into 0 (absent or questionably present) and 1 (definitely present, all severity levels). The EASE measures

the level of lifetime occurrence of ASEs. Each EASE interview lasted 30–90 minutes. EH was trained by one of the authors of the EASE (PM), and conducted all the interviews. The inter-rater reliability (IRR) for the EASE items was found to be very good [30,48,49].

2.5. Statistical analysis

All analyses were performed with the statistical package SPSS, version 18.0. Mean and standard deviations are reported for continuous variables and percentages for categorical variables. We examined bivariate associations (nonparametric correlations) between the 5 subscales of CTQ and EASE total score in addition to symptoms as measured by PANSS subscales and CDSS. A two-way analysis of variance was conducted to explore the impact of CT and gender on levels of ASEs. In the analyses of CTQ subscales, we controlled for multiple comparisons using Bonferroni adjustments i.e. with a p -value of 0.01 as the level of statistical significance. Multiple regression analysis was used to control for CDSS total score as a covariate.

3. Results

Table 1 presents the sociodemographic and clinical features of the sample, including the mean scores of the CTQ. The mean EASE total score is in accordance with other studies on ASEs, and significantly higher than in other mental disorders [27]. There were no significant gender differences in the number of patients reporting childhood trauma. This was also the case for physical abuse, sexual abuse, emotional abuse, emotional neglect, and physical neglect subscale scores (Table 2).

For the whole sample taken together we did not find any significant associations between EASE total score and CTQ total score, or between EASE total score and CTQ subscores. We found a significant association between current depression (CDSS total score) and CTQ total score. In addition, we found significant associations between CDSS score and EASE total score (not in table; $r = .319$, $p = .018$) and

Table 1
Demographic and clinical characteristics.

	55
Number of patients	55
Demographics	
Male gender, n (%)	28 (51)
Age years, mean (SD)	25.2 (7.3)
DUP weeks, median (range)	122 (4–2040)
CDSS, mean (SD)	9.1 (6.0)
EASE, mean (SD)	25.5 (9.7)
CTQ, mean (SD)	
Total score	47.2 (18.8)
Physical abuse	7.2 (4.0)
Sexual abuse	7.2 (4.2)
Emotional abuse	11.9 (5.6)
Emotional neglect	11.9 (5.1)
Physical neglect	8.3 (3.8)

Table 2
Childhood trauma report (CTQ subscales).

		Male	Female	Sig. (2-sided)
Physical abuse	Median (range)	5 (17)	5.5 (20)	.922 ^a
	Trauma present ^b	3 (11)	4 (15)	.705 ^c
	<i>n</i> (%)			
Sexual abuse	Median (range)	5 (11)	5 (20)	.495 ^a
	Trauma present ^b	4 (14)	8 (30)	.205 ^c
	<i>n</i> (%)			
Emotional abuse	Median (range)	10,5 (19)	12 (20)	.674 ^a
	Trauma present ^b	9 (32)	7 (26)	.768 ^c
	<i>n</i> (%)			
Emotional neglect	Median (range)	12 (17)	10 (19)	.800 ^a
	Trauma present ^b	9 (32)	7 (26)	.768 ^c
	<i>n</i> (%)			
Physical neglect	Median (range)	7 (13)	7 (14)	.878 ^a
	Trauma present ^b	9 (32)	9 (33)	1.000 ^c
	<i>n</i> (%)			

^a Mann Whitney U test.

^b Moderate to severe cutoff scores: ≥ 10 for physical abuse, ≥ 8 for sexual abuse, ≥ 13 for emotional abuse, ≥ 15 for emotional neglect, and ≥ 10 for physical neglect).

^c Fisher's exact test.

between CDSS score and sexual abuse, emotional abuse, emotional neglect subscores (Table 3). A two-way analysis of variance indicated a trend-level effect of emotional neglect on EASE total score ($p = 0.04$), with an additional significant interaction effect between gender and emotional neglect on EASE total score (Fig. 1).

In follow-up analyses investigating genders separately, we found highly statistically significant associations between EASE total score and CTQ total score and between EASE total score and emotional neglect subscore in women (Table 3). We also found statistically significant associations between CDSS total score and CTQ total score and between CDSS total score and emotional abuse, emotional neglect, and physical neglect subscores in women (Table 3). When CDSS total score was introduced as a covariate, the significant association between EASE total score and CTQ scores was no longer apparent. There were significantly

lower levels of current depression in men compared to women. Mean CDSS score was 7.1 (SD 4.0) in men and 11.1 (SD 7.0) in women ($p = 0.033$) (not in table). In men we did not find any significant associations between EASE total score and CTQ based scores, nor between CDSS total score and any CTQ scores (Table 3).

4. Discussion

4.1. General discussion

Our main finding was that childhood trauma (CTQ total score) was significantly associated with high levels of anomalous self-experiences (ASEs/EASE total score) in the early treated phases of schizophrenia in women, but not in men. This seemed to be specifically driven by the level of emotional neglect; as shown by significant associations between ASEs and this subscale, but not other subtypes of childhood trauma. The level of ASEs as indicated by the EASE total score was the same as in previous studies of schizophrenia populations [49]; comparable to levels reported in ultra high risk populations [30] and significantly higher than in healthy controls or non-schizophrenia spectrum disorders [24,30,49].

Our findings are consistent with previous studies that show a stronger association between CT and clinical manifestations of psychiatric disorders in women [22]. Although most studies indicate that women report a higher prevalence of childhood trauma than men, there were no such gender differences in the current study. The lack of associations between ASEs and emotional neglect in men could thus not simply be due to less statistical power in the male group.

We also found a statistically significant association between CT and current depression in women, in line with several studies demonstrating a firm link between CT and the risk of depression [50] and with studies suggesting that emotional maltreatments may have particular effects on the development of negative self-image and depression [51]. In particular, emotional neglect in childhood has been

Table 3
Correlation (Spearman's rho) between childhood trauma (CTQ scores) and anomalous self-experiences, and between childhood trauma and depression.

		Physical abuse	Sexual abuse	Emotional abuse	Emotional neglect	Physical neglect	All trauma
Anomalous self-experiences (EASE total score)	Corr. (sign)						
	Males	.53 (.789)	-.337 (.085)	-.182 (.373)	.061 (.757)	-.050 (.802)	-.124 (.553)
	Females	.210 (.303)	.349 (.080)	.451 (.018)	.551* (.004)	.411 (.033)	.623* (.001)
	All	.145 (.294)	.069 (.624)	.196 (.160)	.278 (.042)	.176 (.198)	.250 (.083)
Depression (CDSS total score)	Corr. (sign)						
	Males	-.018 (.928)	.162 (.420)	.088 (.670)	.003 (.986)	-.067 (.736)	-.022 (.915)
	Females	.340 (.089)	.433 (.027)	.586* (.001)	.693* (<.001)	.525* (.005)	.725* (<.001)
	All	.199 (.149)	.360* (.008)	.406* (.003)	.388* (.004)	.244 (.072)	.439* (.002)

* Correlation is significant at the 0.01 level (2-tailed).

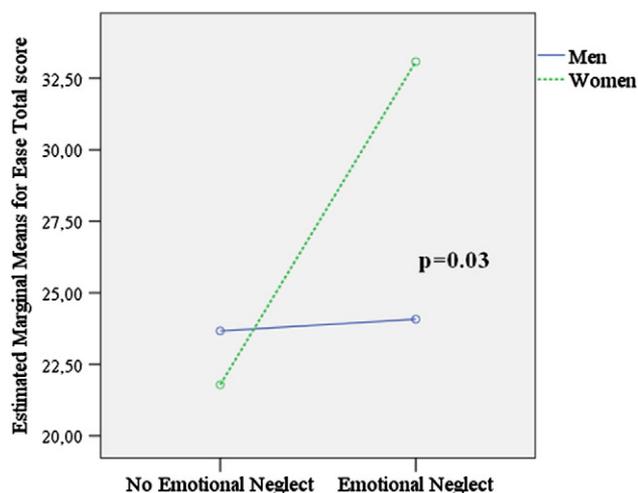


Fig. 1. Interaction between gender and emotional neglect on EASE total score. ANOVA, interaction between gender and emotional neglect: $Df = 1$, $f = 4.91$, $p = 0.03$. “No emotional neglect,” $n = 29$; “emotional neglect,” $n = 25$; men, $n = 28$; women, $n = 26$.

associated with hippocampal and striatal alterations in adults [52]. Sex differences in stress-reactivity, including in the development of the stress-sensitive cortico-striatal-limbic regions [53] could partly explain why CT contributes differently to risk for depression in women and men in line with previous indications that women might be more susceptible to the negative effects of stress [54] and to early trauma [21] in general. The presence of ASEs is today most often viewed as a stage in the development of schizophrenia [27,30,55]. The results of this study could indicate that CT adds to this particular development.

There are several possible explanations of the link between CT, ASEs and depression. It is well-known that CT is a risk factor for the development of depression. If CT also increases the risk of ASEs in susceptible individuals, the link between ASE and depression could either be a statistical artifact or indicate that the presence of ASEs further increases the risk of depression. A model where depression mediates the effect of CT on ASEs in the strict definition of the term is, however, unlikely, since ASEs and CT are thought to be relatively stable over time, while depression fluctuates. We can however not completely rule out that depressive individuals could be biased towards reporting both more CTs and more ASEs. Empirical studies documenting the stability of ASEs over time are thus required. Finally, as we know that ASEs are present before the onset of psychosis and thus could potentially be present already in childhood and adolescence [56], they could interact with difficulties in eliciting or receiving emotional support, which in turn could increase the risk of depression. An alternative explanation could be that females have a more complex response to trauma involving more ASE-like depersonalization and dissociation like phenomena [20,38,39]. However, the lack of gender differences in relevant EASE subscales does not support this hypothesis at present.

4.2. Strengths and limitations of the study

4.2.1. Strengths

We included patients in the early phase of the treated course of the disorder, thereby minimizing potential confounding effects such as selection of non-responders and chronicity that might impact on the assessment of ASEs and CT. The Norwegian mental health care offers public mental health care to all individuals with mental illness within a given catchment area. Because of the absence of private mental health care in Norway, the sample is not biased for socioeconomic class. The study population is representative because we included all consecutive in- or outpatients referred to treatment for a psychotic disorder in two neighboring Norwegian counties in a defined time period.

4.2.2. Limitations

The correlational nature of this study gives no firm conclusions about the direction of associations, or about causality. CT ratings are made from retrospective self-reports, and childhood adversities might be both consequences and triggers of distorted self-experiences. High levels of ASEs and high levels of CT reported could also be a result of recall bias among patients with high levels of depression. However, the retrospective examination of CT in patients with psychosis has been found to be a valid and reliable source when collecting data in previous studies [57].

4.3. Conclusion

Childhood trauma was significantly associated with higher levels of ASEs (EASE total score) in women in the early treated phases of schizophrenia. This seemed to be specifically driven by emotional abuse, emotional neglect and physical neglect. Our data support including emotional abuse, emotional neglect and physical neglect in addition to the more frequently investigated sexual abuse and physical abuse when investigating associations between CT and pre-psychotic and psychotic features.

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Contributors

EH, IM, PM, MØ and BN planned the current study, and OAA contributed to the study design. EH and UB contributed to data collection. EH conducted the statistical analyses and also wrote the first draft of the manuscript. EH, IM and MA contributed to the analyses. All authors

participated in critical revision of manuscript drafts and approved the final version.

Author disclosure

All authors declare no conflict of interest.

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