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Affective temperaments play an important role in the relationship between childhood abuse and depressive symptoms in major depressive disorder

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ABSTRACT

Previous studies have shown that various factors, such as genetic and environmental factors, contribute to the development of major depressive disorder (MDD). The aim of this study is to clarify how multiple factors, including affective temperaments, childhood abuse and adult life events, are involved in the severity of depressive symptoms in MDD. A total of 98 participants with MDD were studied using the following self-administered questionnaire surveys: Patient Health Questionnaire-9 measuring the severity of depressive symptoms; Life Experiences Survey (LES) measuring negative and positive adult life events; Temperament Evaluation of the Memphis, Pisa, Paris, and San Diego auto-questionnaire (TEMPS-A) measuring affective temperaments; and the Child Abuse and Trauma Scale (CATS) measuring childhood abuse. The data were analyzed using single and multiple regression analyses and structural equation modeling (SEM). The neglect score reported by CATS indirectly predicted the severity of depressive symptoms through affective temperaments measured by TEMPS-A in SEM. Four temperaments (depressive, cyclothymic, irritable, and anxious) directly predicted the severity of depressive symptoms. The negative change in the LES score also directly predicted severity. This study suggests that childhood abuse, especially neglect, indirectly increases the severity of depressive symptoms through increased scores of affective temperaments in MDD.

1. Introduction

Various factors such as gene polymorphism, environment and personality traits, are known to be risk factors for the development of major depressive disorder (MDD) (Kendler et al., 1993, 2004; Kessler and Magee, 1993; Wise et al., 2001; Caspi et al., 2003; Gonda et al., 2009; Weich et al., 2009; Caspi et al., 2010; Nakai et al., 2014). Environmental factors are divided into two major types, early life stress and adult stressful life events, both of which are major predictors for depressive symptoms or major depressive episodes/disorders (Kessler and Magee, 1993; Kendler et al., 1999, 2002; Wise et al., 2001; Weich et al., 2009). In particular, childhood abuse also worsens the course of MDD and the treatment response in MDD (Nanni et al., 2012). In our recent study, neglect among various types of childhood abuse was a significant predictor of treatment-resistance in MDD (Toda et al., 2015). Therefore, the above mentioned factors, particularly childhood abuse, may influence the severity of depressive symptoms in MDD.

Recently, we reported that childhood abuse indirectly increased the severity of depressive symptoms through increased scores of affective temperaments measured by Temperament Evaluation of the Memphis, Pisa, Paris, and San Diego auto-questionnaire (TEMPS-A) and affective temperaments directly increased the severity of depressive symptoms in the structural equation modeling

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(SEM) of a nonclinical general adult population (Nakai et al., 2014). Moreover, increased scores of affective temperaments increased the negative appraisal of stressful life events, which in turn mildly but significantly increased depressive symptoms (Nakai et al., 2014). This study was the first study to show the association of affective temperament, childhood abuse and stressful life events in adulthood with depressive symptoms using the SEM in a nonclinical general population, along with the role of affective temperaments as mediators in the influence of childhood abuse on severity of depressive symptoms. In addition, our recent SEM study reported that affective temperaments were mediators in the effect of childhood abuse on MDD diagnosis (Toda et al., 2015). However, to the best of our knowledge, no study has reported the multi-factor effects of stressful life events in adulthood, affective temperament or childhood mistreatment, nor the relationship or mediation between them, on the severity of depressive symptoms in MDD (Baron and Kenny, 1986).

The aim of this study is to clarify how the effects of multiple factors, including affective temperaments, childhood abuse and adult life events, along with the relationship and mediation between them, are involved in the severity of depressive symptoms in MDD patients. First, we examined the effect of the affective temperaments identified in the TEMPS-A (Akiskal et al., 2005), childhood abuse evaluated using the Child Abuse and Trauma Scale (CATS) (Sanders and Becker-Lausen, 1995), positive and negative adult life events during the past year as evaluated using the Life Experiences Survey (LES) (Sarason et al., 1978), and demographic and clinical features on the severity of depressive symptoms in MDD patients. Second, we identified the significant predictors of these factors on depressive symptoms using a stepwise multivariate logistic regression analysis, followed by an SEM to analyze the relationship and mediation between these factors.

2. Methods

2.1. Subjects

Ninety-eight patients (65 male, 33 female) with MDD were treated at the Department of Psychiatry, National Defense Medical College, Hokkaido University Hospital, Self-Defense Forces Central Hospital and Self-Defense Forces Sapporo Hospital. The patients were recruited from April 2012 to April 2013. The inclusion criteria were (a) meeting the criteria for a major depressive disorder in accordance with the *DSM-IV-TR* (*Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition, Text Revision*) (American Psychiatric Association, 2000) by the psychiatrists responsible for these patients, (b) being 20 years of age or older, (c) not having severe physical diseases, (d) not meeting the diagnosis of axis II based on the *DSM-IV-TR,* (e) not having organic brain diseases, and (f) having the capacity to consent to this study.

The authors investigated the demographic and psychosocial characteristics of age, gender, years of education, employment status, marital status, living alone or not, number of offspring, family history of a 1st-degree relative with a mood disorder, comorbid physical disease, psychiatric comorbidities, melancholic features based on the *DSM-IV-TR*, number of previous depressive episodes, and illness duration from the first depressive episode in each patient. Six questionnaires, which are identified below (*2.2.*), were distributed and self-completed, and the 17-item Hamilton Depression Rating Scale (HAMD) and the Young Mania Rating Scale (YMRS) were measured (Young et al., 1978; Williams, 1988).

Written informed consent was obtained from all of the subjects. The patients who did not have the capacity to consent were excluded. The study was performed in accordance with the 1964 Declaration of Helsinki as revised in 2008 and was approved by the institutional review board of the National Defense Medical College and Hokkaido University Hospital.

2.2. Questionnaires

2.2.1. Patient Health Questionnaire-9 (PHQ-9)

The Japanese version of the PHQ-9 was self-completed by the subjects in its written form (Muramatsu et al., 2007). This study employed a summary score for assessing the severity of depressive symptoms.

2.2.2. Life Experiences Survey (LES)

The Japanese version of the LES is a 57-item self-report measure that allows respondents to indicate events that they have experienced during the past year (Sarason et al., 1978; Nakai et al., 2014).The format of the LES calls for subjects to rate the desirability and effect of the events that they have experienced. They are asked to indicate those events experienced during the past year (0–6 months or 7 months–1 year) as well as (a) whether they viewed the event as being positive or negative and (b) the perceived impact of the particular event on their life at the time of occurrence. The ratings are on a 7-point scale ranging from extremely negative (−3) to extremely positive (+3). Summing the impact ratings of the events designated as positive by the subject provides a positive change score. A negative change score is derived by summing the impact ratings of the negative events experienced by the subject.

2.2.3. Temperament Evaluation of the Memphis, Pisa, Paris, and San Diego auto-questionnaire (TEMPS-A)

The TEMPS-A is a self-rating questionnaire consisting of 109 items for men and 110 for women (Akiskal et al., 2005). The subjects completed the Japanese standardized version of the TEMPS-A, which is a true (=2)–false (=1) questionnaire measuring the following temperament dimensions: depressive, cyclothymic, hyperthymic, irritable and anxious (Matsumoto et al., 2005). The score for each temperament subscale is the mean score on the items that make up that subscale.

2.2.4. Child Abuse and Trauma Scale (CATS)

The CATS is a 38-item scale (Sanders and Becker-Lausen, 1995). For each item, participants rate how frequently a particular abusive experience occurred to them during their childhood and adolescence using a scale of 0–4 (0=never; 4=always). The score for each subscale is the mean score on the items that make up that subscale. There are three subscales measuring subjective reports of three aspects of adverse childhood experience: neglect/negative home atmospheres, punishment, and sexual abuse.

To confirm whether depressive symptoms influence CATS scores, CATS and PHQ-9 were measured twice in 50 MDD patients at intervals of one month or longer. The total scores of the CATS were not significantly predicted by the scores of PHQ-9 in a multiple regression analysis.

Tanabe, one of the authors of this study, developed and validated the Japanese version of the CATS using the classic translation–back translation technique with the permission of Dr. Sanders, the developer of the CATS (Tanabe et al., 2010).

2.3. Data analysis

We constructed a path model using SEM (Fig. 1), which posited that (1) the four subscales of TEMPS-A (depressive, cyclothymic, anxious and irritable) are derived from the latent construct of'-other temperaments'; (2) the neglect subscale of CATS predicts the latent construct of temperament, the hyperthymic subscale of TEMPS-A, positive and negative change scores of LES, and PHQ-9;

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