



History of childhood physical trauma is related to cognitive decline in individuals with ultra-high risk for psychosis



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ABSTRACT

The aim of this study was to investigate the relationship between childhood trauma (CT) and cognitive functioning in individuals with ultra-high risk for psychosis (UHR). Fifty-three individuals at UHR for psychosis were administered a neurocognitive battery that assessed attention, processing speed, verbal learning, memory, working memory, interference inhibition, and sustained attention. The CT was assessed using the short-version Childhood Trauma Questionnaire (CTQ). We dichotomized the sample by using cut-off scores for the presence of emotional, physical and sexual trauma, and physical and emotional neglect. Those with a history of physical trauma performed worse on the Digit Span Forward test, Trail making B (time), Stroop test (difference between color and word reading times), and completed categories of the Wisconsin Card Sorting Test (WCST). Physical trauma scores were correlated with WCST-completed categories, Digit Span Forward and Stroop test scores. Physical neglect scores were negatively correlated with Digit Span Forward Test scores. Most of the significant dose-response relationships between cognitive impairment and different subtypes of CT were found only in men. There was no difference between those with and without other kinds of childhood abuse or neglect in terms of cognitive impairment.

Our findings suggest that a history of physical trauma has a negative impact on cognitive function in individuals at UHR for psychosis.

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1. Introduction

People with a history of childhood trauma (CT) have an increased risk of developing psychiatric disorders including major depression, anxiety disorders, substance dependence, post-traumatic stress disorder, psychosis, dissociative disorders, and eating disorders (Cutajar et al., 2010; Duran et al., 2004; Kauer-Sant'Anna et al., 2007; Heim and Nemeroff, 2001; Schechter et al., 2000; Thompson et al., 2009). CT is more common in people with psychotic disorders (Kilcommons and Morrison, 2005; Read and Argyle, 1999). There is also a dose-response relationship between CT and positive symptom severity in patients with first-episode schizophrenia (Üçok and Bıkmaz, 2007).

Regarding the association between trauma and the ultra-high risk (UHR) group for psychosis, it has been reported that the prevalence of traumatic experiences is significantly high among individuals at UHR (Velthorst et al., 2013; Lysaker and LaRocco, 2008). In our recent study, we found that patients at UHR had higher total Childhood Trauma Questionnaire (CTQ) scores and also higher subdomain scores,

including emotional and physical abuse, and physical and emotional neglect than the control group (Sahin et al., 2013).

Studies exploring the association between childhood trauma and long-term cognitive deficits are few and inconsistent. Infants who have been abused show deficits in cognitive and language skills (Culp et al., 1987; Palmer et al., 1997). Intellectual development delays and language deficiencies were detected in sexually abused children. In a study of adults without psychiatric disorders, history of childhood trauma was significantly associated with more deficits in long-term and working memory, and worse academic achievement (Majer et al., 2010). In another study of adolescents without psychiatric disorders, the total CTQ scores were significantly associated with perseverative errors in WCST, which indicated that history of childhood trauma was associated with diminished cognitive flexibility.

It has been shown that cognitive performance is worse in patients with schizophrenia who also have comorbid post-traumatic stress disorder (Fan et al., 2008). In Aas et al.'s (2011) on first-episode psychosis, the correlation between trauma and cognitive impairment was significant in male patients with affective psychosis only. In another recent study, physical and sexual abuse, and physical neglect were significantly associated with reduced scores in working memory and executive

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function in patients with schizophrenia spectrum or bipolar disorders (Aas et al., 2012a).

It was reported that individuals at UHR for psychosis have more cognitive deficits compared with controls (Thompson et al., 2011; Fusar-Poli et al., 2012; Addington and Barbato, 2012; Üçok et al., 2013; Bora and Pantelis, 2013; Barbato et al., 2013). Individuals at UHR have worse performance on tests of general intelligence, executive function, verbal and visual memory, working memory, and social cognition (Fusar-Poli et al., 2012).

No studies have focused on the relationship between CT and cognitive performance in individuals at UHR. In our previous studies, we reported that the UHR group had more childhood trauma (Sahin et al., 2013) and cognitive deficits (Üçok et al., 2013) compared with controls. The aim of this study was to test the relationship between CT and cognitive function in the UHR group. We hypothesized that individuals at UHR with a history of childhood trauma or neglect would have worse cognitive performance compared with those without CT. We also hypothesized that there would be a dose-response relationship between CT and cognitive deficits in the UHR group.

2. Materials and methods

2.1. Participants

This cross-sectional study was conducted in the Psychotic Disorders Research Program, Istanbul Faculty of Medicine. Fifty-three individuals who were newly diagnosed as being at UHR were consecutively recruited. Our sample comprised help-seeking persons who came directly or were referred to our university clinic by other psychiatrists for further evaluation. We used the previously defined criteria to identify individuals at UHR (Yung et al., 1998). The individuals were defined as at UHR if they met the criteria of at least one of the following conditions: 1) Brief limited intermittent psychotic symptoms (BLIPS); 2) Attenuated psychotic symptoms; and 3) Family risk with reduced function.

The BLIPS and attenuated symptom groups were operationally defined using the Brief Psychiatric Rating Scale (BPRS) (Overall and Gorham, 1962), which uses a scale of 1–7 points for each item. BLIPS were operationally defined as follows: a score of 4 or more in the hallucination item, a score of 5 or more in the unusual thought content item, or a score of 4 or more in the conceptual disorganization item. These levels had to be sustained for less than one week. The operational criteria for the group with attenuated psychotic symptoms was defined as follows: a score of 2 or 3 in the hallucination item, a score of 3 or 4 in the unusual thought content item, or 3–4 in the suspiciousness item. The third group consisted of individuals who had a first-degree family member with a psychotic disorder or schizotypal personality disorder, plus impaired function that resulted in a decrease of at least 30 points on the Global Assessment of Functioning (GAF) scale within the last 12 months. Participants were classified into these subgroups according to the BPRS-expanded subscale scores. Individuals were evaluated by a senior psychiatrist (A.U.). Seventy-two percent of the individuals were in the attenuated psychotic symptoms subgroup, 17.9% were in the BLIPS subgroup, and the remaining individuals were in the family risk with reduced function subgroup. Seven of the individuals in the attenuated psychosis group and one individual in the BLIPS group also had a family history of schizophrenia in their first-degree-relatives. All participants completed an informed consent form for the study. Exclusion criteria were as follows: Unwillingness to participate, illiteracy, mental retardation, prior antipsychotic treatment, severe medical condition, prior history of psychosis that lasted more than a week, and present alcohol and substance abuse.

2.2. Procedure and instruments

Patients were administered the Brief Psychiatric Rating Scale-expanded (BPRS) (Lukoff et al., 1986), the Scale for the Assessment of

Negative Symptoms (SANS), the Scale for the Assessment of Positive Symptoms (SAPS), the Childhood Trauma Questionnaire (CTQ), the Calgary Depression Scale for Schizophrenia (CDSS), and the Global Assessment of Functioning (GAF) scale (American Psychiatric Association, 2000).

BPRS-expanded contains 24 items, each of which is evaluated using a 1–7 Likert-type scale. Although assessment of the first 14 items depends on the interview, the last 10 items are evaluated based on observation and interview (Lukoff et al., 1986). The SANS (Andreasen, 1983) and the SAPS (Andreasen, 1984) were administered to assess positive and negative symptoms.

The Calgary Depression Scale for Schizophrenia, a 9-item 0–3 points Likert-type physician questionnaire, is known to be a valid tool for assessing depression among patients with schizophrenia (Addington et al., 1992). The validity and the reliability of the Turkish version of CDSS were evaluated by Aydemir et al. (2000).

The Childhood Trauma Questionnaire was developed by Bernstein and Fink (Bernstein and Fink, 1998). It evaluates childhood emotional, physical and sexual abuse, and childhood physical and emotional neglect. The short-form CTQ is a Likert-type (1–5 points), self-report questionnaire with 28 items. The scale also demonstrated good test–retest reliability over 2–6 months (intraclass correlation 0.88) (Bernstein et al., 1994). We calculated a mean CTQ score as well as five subscale scores for different kinds of childhood trauma. We used the predefined cut-off scores used in the study that evaluated the validity and reliability of the Turkish version (Şar et al., 2012).

2.3. Neuropsychologic tests

2.3.1. The Rey auditory verbal learning test

The Rey Auditory Verbal Learning Test is a list-learning task in which participants are read a list of unrelated words and are then tested for what they have learned by recall (Rey, 1964). Performance measures are the total number of correctly recalled words in trials I to V (verbal learning) and in the delayed recall trial (secondary verbal memory).

2.3.2. Stroop test

The Stroop test measures selective attention, interference inhibition, and processing speed, as well as cognitive flexibility and executive function (Golden, 1978). Participants are asked to immediately say the colors of the rectangles in the first stage, and then to immediately say the names of the written color in the second stage. After the tendencies have been noted, in the final stage the participants are asked to say the ink color of the words on the cards instead of reading the names of the written colors. The number of commission errors and time difference between color and word reading tasks provides the performance measures.

2.3.3. Wisconsin card sorting test (WCST)

In the computer version of the WCST, the participants are presented with stimulus cards with shapes on them. The cards differ in the color, number, and the form of the shapes. Participants are expected to find the matching rule according to oral feedbacks given as “right” or “wrong.” During the test, the matching rules are changed and the participants must discover the new rule in order to be successful. First, matching should be made according to the color rule. This rule changes after the participant has correctly matched ten cards with the colors. The participant is then expected to match the cards according to the shape rule. This rule also changes after the participant has correctly matched ten cards with the shapes. Finally, matching is made according to the number of the shapes on the cards. The dependent variables are the number of correct answers and sets completed (Heaton et al., 1993). This test is used to measure executive function and working memory.

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