



Review article

Toward a unified theory of childhood trauma and psychosis: A comprehensive review of epidemiological, clinical, neuropsychological and biological findings



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ABSTRACT

There is a growing body of research focused on the relationship between childhood trauma and the risk of developing psychosis. Numerous studies, including many large-scale population-based studies, controlling for possible mediating variables, provide persuasive evidence of a dose-response association and are indicative of a causal relationship. Existing evidence supports the specificity model, showing differential associations between particular adversities and clinical symptoms, with cumulative adversity causing less favorable clinical and functional outcomes in psychotic patients. To date, several psychological and biological models have been proposed to search for underlying developmental trajectories leading to the onset of psychosis, influencing psychopathological manifestation and negative functional outcomes due to a history of childhood trauma. In this article, we provide a unified review on the relationship between childhood trauma and psychosis by integrating results of epidemiological, clinical, neuropsychological and biological studies. The question whether psychosis with a positive history of childhood trauma should be considered as a new psychotic phenotype, requiring specific therapeutic interventions, warrants further investigation.

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1. Introduction

Childhood trauma is defined as harm, potential of harm or threat of a harm resulting from commission or omission by child's caregiver (Sideli et al., 2012). This definition captures a range of severe adverse experiences, such as physical, sexual and emotional abuse, neglect, parental death and bullying, which according to latest research, may affect about one- third of the general population (Kessler et al., 2010). The most common forms of trauma, reported by both men and women, are physical abuse, physical neglect, and emotional abuse, all of which are likely to co-occur (Scher et al., 2004). Accumulating body of evidence suggests the association between childhood adverse experiences and increased risk of a range of negative social outcomes including mental illnesses, next to lower educational level or higher criminality (Sarchiapone et al., 2009; Scher et al., 2004).

Recent studies have focused on establishing the biopsychosocial model of psychosis. Both biological vulnerability and environmental exposure impact the onset and outcome of schizophrenia, spectrum disorders. In the recent years, some models focused on the central role of stressful life events that may influence critical windows of brain development, triggering the onset of psychosis, as well as act in the course of psychosis worsening long-term outcomes (Misiak et al., 2014b). In addition, it has been demonstrated that psychosocial stress, especially childhood traumatic events, may interact with genetic vulnerability or shape gene expression via epigenetic mechanisms, contributing to the development of psychiatric disorders (Babenko et al., 2015; Brietzke et al., 2012).

Several lines of evidence indicate that a history of childhood adversities is highly prevalent in patients with psychosis, influences psychotic psychopathology and correlates with biological alterations underlying the pathophysiology of psychosis. In this article, we discuss results of epidemiological studies addressing the association between childhood trauma and psychosis. In subsequent sections, we describe correlates of childhood adversities in clinical manifestation and outcome of psychosis. We also provide an overview of studies investigating biological consequences of childhood trauma. Finally, we present an integrated summary of findings with critical point of view for current evidence and research gaps in the field that need to be addressed in future studies. We raise the discussion as to whether positive history of childhood trauma might provide new insight into psychological mechanisms of psychosis development together with specific epidemiological, biological and clinical correlates that are present in patients with psychotic disorders exposed to adverse childhood events. A simplified overview of an integrated and unified theory behind the relationship between childhood trauma and psychosis was presented in Fig. 1.

2. Epidemiological findings

The meta-analysis performed by Varese et al. (2012b) revealed that patients with psychosis are almost 3 times more likely to report having been exposed to childhood trauma in comparison with healthy controls. These findings have been reported regardless of study design and type of traumatic events with exception of parental death, which had not been associated with increased psychosis risk. In agreement with these findings, a recent meta-

analysis by Bonoldi et al. (2013) estimated the prevalence of childhood sexual, physical and emotional abuse at 26%, 39% and 34%, respectively. Some studies have also reported that childhood adversities may increase psychosis risk in a dose-dependent manner (Schafer and Fisher, 2011). Interestingly, in the study by Lataster et al. (2012), early and recent adversities have been associated with each other without an additive effect at the highest level of exposure to recent stressors. These findings might suggest that early childhood adversities may lead to psychosis development either by increasing exposure to later adversity or by making individuals more sensitive to later adversity if it is severe. In one study, the magnification effect of latest traumatic experiences on the ones from childhood was observed (Bebbington et al., 2011). Importantly, a history of childhood trauma has been associated with psychotic experiences in healthy people (Sommer et al., 2010). Additionally, it has been shown that a history of childhood adversities might be related to a persistent trajectory of these symptoms (Wigman et al., 2011a,b). Finally, childhood traumatic events have been found to predict transition from ultra-high risk for psychosis (UHR) states to overt psychosis (Thompson et al., 2014; Yung et al., 2015). In one of these studies (Yung et al., 2015), transition to psychosis predicted poor long-term functioning, suggesting that the UHR conceptualization may detect a subgroup of individuals, who are at risk of schizophrenia development. Importantly, it should be noted that cessation of traumatic experiences may reduce the incidence of psychosis (Kelleher et al., 2013). The above mentioned meta-analysis by Varese et al. (2012b) revealed that the removal of childhood adversities would result in a 33%-reduction in the number of psychosis cases.

Since a number of environmental insults have been associated with a risk of psychosis, epidemiological studies have also focused the interest on the interactions of childhood adversities with other risk factors in order to provide broader insight into social trajectories leading to psychosis onset. Indeed, there are studies addressing interactions between socioeconomic status, cannabis use, urbanicity and childhood adversities on the development of psychosis. The second Netherlands Mental Health Survey and Incidence Study-2 (NEMESIS-2) provided evidence that social defeat may serve as a mediating variable in the association between childhood trauma and psychosis (van Nierop et al., 2014). In addition, both NEMESIS-1 and NEMESIS-2 indicated that a history of childhood trauma mediates the relationship between sexual minority status and psychosis risk (Gevonden et al., 2014; van Nierop et al., 2014). However, it has not been confirmed that familial history of psychosis (a proxy genetic risk) accounts for association between childhood physical abuse and psychosis risk (Fisher et al., 2014). Other studies revealed an additive effect of urbanicity, cannabis use and childhood trauma on the risk of subthreshold psychotic experiences (Guloksuz et al., 2015). Similarly, there are studies showing interactions between cannabis use and childhood traumatic events (Harley et al., 2010; Houston et al., 2008; Houston et al., 2011; Konings et al., 2012; Murphy et al., 2013). Interestingly, in the study by Houston et al. (2008), the effect of sexual trauma on psychosis development was significant only for those, who used cannabis under the age of 16 years.

It should be noted that the majority of epidemiological studies in this field are based on retrospective self-reports of childhood trauma. This controversial issue appears also in other studies inves-

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