

Role of Early Childhood Traumatic Stress in the Development of PTSD in Adulthood: A Review

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Abstract

Traumatic stress has been known through ages and children make a significant group to face it. Vast research has been done in traumatic stress to show the cause effect relationship. Post-traumatic stress disorder (PTSD) has been recognized subsequent to trauma and has been invariably linked to it. Besides PTSD, there have been a multitude of psychopathologies attributed to childhood traumas. Short-term effects of childhood traumas are studied in depth but the long-term effects are subject to a variety of risk and protective factors. Childhood maltreatment and other cumulative traumas are shown to cause a spectrum of anxiety disorders and mood disorders besides others; in contrast to single traumas of childhood mainly presenting as PTSD as a pathology. Re-trauma in adulthood of these early traumatized children seems to be a risk factor for PTSD and other pathologies. Significant neurobiological changes (structural and genetic) have been shown to occur in adults with childhood traumatic experiences. Resilience has been significant and has been seen more developed in children with effective parenting, stable families, adequate social support, spirituality and humour. Positive self-esteem, ego flexibility, and ego over-control are protective. These protective practices need to be identified and promoted in children with special emphasis in those having experienced traumatic stress.

Keywords: Trauma; Children; Post-traumatic stress disorder; Depression; Effects

Introduction

A long traditional debate has been going on regarding the mental health effects of trauma in psychiatry. Pathological stress response syndromes have been known to result from exposure to war, sexual assault and other types of trauma. Evidence for post-traumatic reactions date back as far as the Sixth century B.C.; early documentation typically involved the reactions of soldiers in combat. Beginning in the 17th century, anecdotal evidence of trauma exposure and subsequent responses were more frequently reported. In 1666, Samuel Pepys wrote about individual's responses to the Great Fire of London [1-3].

In the context of current turmoil prevalent worldwide, no age group is immune from exposure to trauma, and its consequences [4]. The National Co morbidity Survey in America estimated the lifetime exposure to any trauma among men and women at 60.7% and 51.2% respectively [1]. Similarly, the Australian National Mental Health Survey reported the lifetime exposure to trauma among men and women at 64.6% and 49.5% respectively [5]. Lesser epidemiological studies on trauma in general populations have emerged from poor and economically developing countries, although some recent research has begun to improve our understanding of trauma in poor, war torn countries [6-8].

The association between retrospectively reported childhood adverse experiences/traumas and psychiatric morbidity in adulthood is documented in several surveys of community and clinical samples [9,10]. Research studies in recent years have confirmed that PTSD and its inherent co-morbidity occurs not only in adult victims of traumatic life events but in children across the age spectrum [11]. However it has been difficult to substantiate this causal link with the prospective longitudinal data, but, the assumption remains viable based mostly on cross sectional and/or retrospective studies of persons with psychopathology, and in particular PTSD, who report such early life

trauma. This paper reviews the effects of childhood trauma in the form of PTSD besides discussing the basic concept of childhood trauma. It will also discuss variation in symptom presentation of single and cumulative trauma vis-a-vis development of PTSD. Neurobiology of trauma and the protective factors will also be reviewed.

Childhood Traumas and PTSD: Cumulative Versus Single Traumatic Stressors

Since children form 40 percent of the total population in developing countries, and 25 percent of population in developed countries, the recognition of psychiatric problems in children by adults is important, as it is they who determine whether and where consultation and treatment will be sought. Historically childhood studies of trauma expanded from clinical case reports to systematic comparisons using a 'dose of exposure' design with inclusions of contemporaneous, comparison and control groups. There has been continuous controversy about the impact of disasters/traumas on victims including children and some investigators denied that serious psychological effects occurred, however this denial was based on inadequate extremely narrow research conducted by clinicians and has called for more systematic, clinically relevant investigations [12-16].

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Although nowadays nearly every researcher agrees that early childhood traumas lie at the root of most long-term depression and anxiety, and many emotional and psychological illnesses. But among mental health professionals, and even among some childhood development specialists, there is sometimes a lack of understanding over exactly what constitutes childhood abuse. A seminal American Academy of Paediatrics (AAP) report 1995 defines childhood abuse as "a repeated pattern of damaging interactions between parent(s) [or, presumably, other significant adults] and child that becomes typical of the relationship." In addition to physical, sexual and verbal abuse, this can include anything that causes the child to feel worthless, unlovable, insecure, and even endangered, or as if his only value lies in meeting someone else's needs. Examples cited in the report include "belittling, degrading or ridiculing a child; making him or her feel unsafe [including threat of abandonment]; failing to express affection, caring and love; neglecting mental health, medical or educational needs." The AAP also includes parental divorce in the list of potentially harmful events which can traumatize a child [17,18].

Early maltreatment and other cumulative traumas are related to adult PTSD as higher rates of childhood abuse and maltreatment have been found among individuals with PTSD than among those without PTSD [19,20]. But cumulative traumas have more often been shown to be associated with higher rates of anxiety, suicidality, dissociation, personality disorders, substance abuse, physical illness, and interpersonal problems [21-25]. Slow trauma in the form of adverse parental rearing styles (including lack of care and overprotection) has been associated with the risk for anxiety disorders [10]. Altogether there is a growing evidence for the pervasiveness of cumulative exposure to violence/maltreatment/abuse as contrasted to exposure to a single discrete episode of trauma led Finkelhor et al. to postulate that victimization is a "condition" rather than an "event." Cross-sectional studies have indicated that among children who experience war trauma, between 25% and 62% suffer from PTSD [26-29].

Single traumas have a different effect than the cumulative traumas. Up to 87% of children have been shown to suffer from PTSD after traumas of natural disasters [30-32]. Very high rates of PTSD have been seen to occur after traumas of extreme violence; for example, the rates of PTSD after being kidnapped, witnessing the murder of a parent, or experiencing violence have ranged from 95% to 100% [33,34].

The review of the present evidences has shown that, there is a higher rate of PTSD in children in response to single-episode childhood trauma, although the majority may recover within a relatively short period of time. The studies have also suggested that childhood maltreatment itself is not commonly related to adult PTSD and other factors need to be considered in understanding the association between childhood abuse and adult PTSD. Rather childhood maltreatment and abuse has been shown to give rise to other anxiety disorders and the single traumas have more propensities to lead to acute PTSD [35].

Early Life Trauma and PTSD: Effects of Adulthood Traumas

Time and again early life trauma has been demonstrated to be a risk factor for development of PTSD to subsequent traumas. The association between previous exposure to traumatic experiences and posttraumatic stress disorder (PTSD) resulting from subsequent trauma has been reported [19,36,37]. Early life victimization in women who have been raped have been reported to have adverse effects on the likelihood and course of the psychological sequelae of the later trauma in the form of PTSD. Similar findings have been also shown in men fighting a

subsequent war [38,39]. Further a history of childhood trauma as a risk for PTSD following adult trauma has been shown in a meta-analysis of 77 studies of risk factors for PTSD. This meta-analysis showed a positive correlation across populations regardless of gender, trauma type, or population studied [40]. Higher rates of childhood trauma have also been reported in Vietnam combat veterans with PTSD [36,37,41].

However the existing literature does not clearly establish the relation between childhood trauma and the subsequent development of PTSD. As Owens et al. has recently raised questions regarding the general presumption of negative effects of trauma in war veterans vis-a-vis early life traumas [42]. Similar observations were earlier argued by Stein et al. in [43]. This presumption needs to be evaluated further before any firm conclusions are drawn. The mechanisms by which early life trauma can present risk for adult PTSD need to be examined further.

Neurobiological Effects

Considerable interest was generated by early research on the physiologic effects of stress, leading to the idea that external events could have a profound impact on the biology and behavior of organisms. Catecholamines and glucocorticoids that are the first stage of defense to circumstances that threaten homeostasis (i.e. stress). An endocrine response to stress is activated when faced with provocative stimuli, exaggerated HPA activity or extended exposure to high glucocorticoid levels is also harmful to the developing brain [45,46].

A prolonged traumatic stress response often results in abnormal timing, intensity, and pattern of catecholamine activity in a child's maturing brain [47]. It has been observed that there is an elevation in cortisol and catecholamines in maltreated children with PTSD compared with normal control subjects Further a blunted diurnal variation of cortisol has been seen among women with a reported history of childhood physical or sexual abuse [48,49].

A similar blunted response has been also seen among adults with history of abuse or neglect in early life [21] Researchers have found that HPA axis dysregulation was uniquely associated with those abused children with high depressive or internalizing symptoms. Research also suggests that the HPA axis is more responsive to stress in symptomatic survivors of trauma, in PTSD [50].

Specific brain areas such as hippocampal volume might also be affected by prolonged over-stimulation of the HPA stress response system, also likely as a result of over secretion of CRF, which has been reported to exert toxic effects on hippocampal neurons [51]. Small hippocampal size has been seen in trauma survivors than those without traumatic experiences [52].

The basic mechanisms through which these traumas lead to these phenotypic changes has been the formation of gene products. This process in turn influence cellular processes that lead to gene expression, protein formation, and concomitant biological and behavioural change [53]. The stress based changed effects and the subsequent transmission could be reason for genetic or epigenetic basis for individual differences in stress reactivity [54]. The neurobiological impact of trauma is under active research.

Resilience and Protective Factors

Resilience is a dynamic process wherein individuals display positive adaptation despite experiences of significant adversity or trauma [55]. With regard to childhood traumas, resilience is a multifaceted amalgamation of genetic predispositions and personal, familial, and environmental risk and protective factors [56]. The literature

is extensive, upholding the importance of protective psychological factors in the prevention of negative outcomes [57]. Children exposed to different kinds of trauma frequently show resilience in the form of protective characteristics that follow multiple pathways to foster their positive development [55,58]. However research so far has not been very clearly strict to delineate the risk factors and protective factors vis-a-vis the outcome of trauma [59].

Resilient maltreated children have been characterized as showing positive self-esteem, ego flexibility, and ego over control [60]. Environmental factors that possibly promote positive mental health despite traumatic experiences and protect against PTSD are social acknowledgement, social support, relationships and relationship quality, and stable living conditions during adolescence [61-64] other factors that promote better outcome, interpreted as components of the psychometric construct of resilience are humour and spirituality [65].

Positive features of families are associated with positive child adaptation following violence. Effective parenting has been one of the most well studied protective factors for early life traumas [66]. Religious and spiritual involvement and obedience to local clergy, Imams and spiritual healers foster psychometric construct of resilience. In addition, hope has been reported as an important variable in resilience [67,68].

Conclusion

Childhood traumas have been shown to affect the physical, psychological and emotional well being. The long-term effect of childhood traumas seems to be linked with the development of depression, anxiety disorders, and personality disorders beyond PTSD, although the differences are seen based on the type of trauma. Re-victimization of adults with childhood traumatic experiences are prone to develop PTSD. Fostering humour and spirituality besides effective parenting and social support are protective in these traumas. Recognition of trauma-related stress in children is the first step towards healthier adulthood. The genetic and neurobiological evidence is not scarce to prove the effect of these traumas beyond doubt.

Competing Interests

The authors declare that they have no competing interest.

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