

Autism as an Infantile Post-trauma Stress Disorder: A Hypothesis

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Abstract

Autism spectrum disorder (ASD) is a pervasive developmental disorder which affects a great number of children around the world while the etiology is largely unclear. A hypothesis that autism is an infantile post-trauma stress disorder (PTSD) was proposed in this article based on comparisons of symptoms between ASD and PTSD and the integration of findings on neural basis of autism and the *Intense World Theory* of autism. Attachment related trauma was considered as the main traumatic experience related with autism and specific neural basis which interacts with trauma in the development of autism was discussed. Based on the hypothesis, we insisted that restoring the attachment between the child with autism and the parents and re-establishing the sense of security and control in the child were the main goal of interventions for children with autism.

Keywords: ASD; PTSD; Attachment; Innate vulnerability; Treatment principle

Introduction

Autism spectrum disorders (ASDs) is a group of neurodevelopmental disorders characterized by persistent impairment in reciprocal social communication and social interaction, and restricted, repetitive patterns of behavior, interests, or activities presenting from early childhood and limiting everyday functioning [1]. Based on the results of epidemiological research, ASD affects approximately 1% children worldwide with increasing prevalence rate in recent years [2-4].

Although the definite cause of ASD has not been identified, researchers proposed that both genetic susceptibilities and environmental factors contribute to the development of the disorder [5]. However, most researchers focus on unraveling the genetic architecture of ASD but do not pay much attention to environmental factors. It is reported that the genetic factors alone likely cannot contribute to the rise of ASD and environmental factors may play a vital role in the rise of the disorder [5]. Therefore, it is important to identify environmental risk factors for developing autism.

Based on the recent findings on the etiology of autism, the long-term working experience with autistic children and their parents and our understanding of diagnoses of ASD and post traumatic stress disorder (PTSD), we propose that traumatic events in early life might be important in the multi-factorial causation of ASD; The cognitive, behavioral and social features of children with autism could be considered as symptoms of post-trauma stress disorder (PTSD) with an infantile onset.

Explaining Symptoms of Autism in the Framework of PTSD

According to DSM-V, exposure to actual or threatened death/serious injury/sex violence is a mandatory requirement for the diagnosis of PTSD. In addition, three core symptoms should be presented:

1) Intrusion symptoms associated with traumatic event(s) including recurrent and intrusive distressing memories, dreams, dissociative reactions and intense or prolonged psychological distress and marked physiological reactions to reminders of traumatic events.

2) Persistent avoidance of stimuli or negative alterations in cognitions and mood associated with traumatic events.

3) Alternations in arousal and reactivity associated with the traumatic event(s).

We argue that symptoms of autism perfectly meet the criteria of PTSD as following:

Exposure to Traumatic Events

Traumatic experience could be found in almost all the cases the corresponding author has treated. The traumatic events include early separation with significant others, frequent change of caregivers, severe physical symptoms and related panic experience in the process of medical treatment, negative parenting and serious family conflict. Many children encountered multiple traumatic experiences and symptoms of autism usually occur after a significant traumatic event. Furthermore, improper treatment could traumatize the child again and worsen the symptoms after the diagnosis of autism has been given.

We take one of our cases as an example. Lei (pseudonym) was a 8-year old boy diagnosed as autism when his parents took him into our treatment. A series of traumatic events were found before he got the diagnosis at three. At the birth of Lei, he experienced apnea. This might be the first trauma he experienced although no direct effects of the event could be identified. He seemed to be a normally developed boy at the age from one to two years. At that time, he was sent to the grandmother's home and met with his parents only in the weekends. This compulsory separation with parents forces the child to adjust new environment and to establish relationship with new caregivers. This experience may do harm to the parent-child relationship and could be a potential trauma to the young child. At age 2, a serious asthma attack happened to him. As the parents recalled, "the symptoms were severe and we were told that the child had to stay in hospital. Doctors and nurses gave him medication and injection several times every day. He

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resisted very hardly and we had to help the nurse to immobilize him. It is really painful memory.” This asthma attack is a great traumatic experience to Lei. The deadly symptoms made the child panic and the treatment also frightened him a lot. Although parents explained the necessity of taking medication, Lei might be not able to understand their action to immobilize him. For children who is extremely sensitive and frightened, this action might make him feeling loss of control and helpless. He might interpret that the parents were hurting him along with the doctors and nurses. Shortly after the severe asthma attack, Lei’s father had to leave their city due to job transfer. Because the father was the one who understood Lei most and had best relationship with him within the family, separation with the father might be another traumatic experience. His parents observed that several signs of autism occurred following the asthma attack and the separation with father including regression of linguistic ability and emotional problems.

As noted above, inappropriate treatment after the signs or diagnosis of autism would continue to traumatize the child. This happened to Lei as well. Lei’s mother sought to correct his misbehavior by sending him to kindergarten at three months past two years old. However, because Lei still cannot feed and use the toilet by himself, he had very difficult time to adapt to life in kindergarten. The teacher was not patient enough to take care of Lei and considered him as “problematic”. Lei was afraid of the teacher very much and cried every day when he had to go to kindergarten. His symptoms went worse and the ability of language was completely lost when he obtained the diagnosis of autism.

Symptoms of autism occur before 3 years old. It might be associated with failure on the completion of the developmental challenge of the first stage described by Erikson. According to Erikson’s stages of psychosocial development in which a healthy developing individual should pass through from infancy to late adulthood, the major developmental task for children at 0-2 years is to establish the basic trust to others [6]. Successful completion of this task depends on the quality of the relationship with the primary caregiver, that is, the quality of attachment. If the parents expose the infant to warmth, regularity and dependable affection, the child’s view to the world would be one of trust. If the parents fail to provide a secure environment, a sense of mistrust would result. Development of mistrust can lead to feelings of frustration, suspicion, withdrawal, and a lack of confidence later in life.

As revealed in the previous research, children with autism are less likely to establish secure attachment style compared with typically developed children. And the severity of autism is negatively associated with attachment security [7-9]. Although it is possible that symptoms of autism prevent the child from forming secure attachment with the caregiver, learning from Lei’s case and cases of other children in our treatment, we argue that children with autism fail to develop a sense of trust and it is hampered by adverse events happened in the interactions with parents in the critical period to establish attachment relationship. That is, autism is associated with attachment related traumatic experience.

Typical Symptoms of PTSD and ASD

Trauma re-experience is one of the core symptoms of PTSD. For children with PTSD, they would present intrusion symptoms such as the traumatic event(s) related content in play reenactment and dreams. Parents of children with autism often report the problem of frequent awake in the night [10]. It might be associated with disturbance of the trauma related dream although it is difficult to ascertain that.

The second core symptom of PTSD is avoidance of stimuli

associated with traumatic events or negative alterations in cognitions and mood associated with the traumatic events. Avoidance is also an important feature of autism.

First, children with autism show obviously avoidant behavior to people. They have averted gaze and usually wobble hands in front of eyes (a typical stereotype behavior). These behaviors could prevent themselves from having direct interaction with people. If the traumatic experience is interpersonal, it is understandable that they perceive others as dangerous and motivate to protect themselves by avoiding people. Children with autism avoid interaction with other people including their parents. They lack of emotional connections with their parents and the parent-child relationship is usually problematic [11].

Second, children with autism show markedly diminished interest or participation in significant activities as described in the avoidance symptoms of PTSD. Their interests are very narrow and they show little interest in activities done by other children at the same age.

The third core symptom of PTSD is hypervigilance. Children with this group of symptoms often 1) have difficulties falling or staying asleep; 2) are irritable and 3) have concentration problem. Sleep disturbance is prevalent in children with autism. Based on the results of a recent meta analysis, the prevalence of sleep disorders among children with ASDs is estimated to range from 45%-86% [10]. Insomnia and frequent awakening are common sleep problems. Their sleep quality is poor [12]. And some of them have the problem of parasomnia such as sleep walking, sleep talking and night terrors [13]. The concentration problem is also common in children with autism. According to results of a previous research, the comorbidity of ASD and ADHD estimates range from 37%-78% [14]. The attention problem is considered as the common pathway to ADHD and ASD [15].

The language deficit in children with autism might be also the manifestation of the PTSD. There has been evidence that PTSD is associated with neurocognitive impairment. Dysfunctioning and structural impairment of hippocampus have been observed in patients affected by PTSD [16]. In behavioral experiments, these patients have worse performance in tests measuring verbal and nonverbal working memory [17]. Because working memory is important for complicated cognitive tasks such as language acquisition, we argue that PTSD could have deleterious effects on language skills especially for children who are at the critical period of language acquisition. Although we have not found direct evidence on the association between traumatic stress and language problems in children with autism, there has been some indirect evidence to support our viewpoint. In research on the secondary language acquisition of refugees, researchers found that there are negative correlations between complex PTSD, number of traumatic events and language acquisition in refugees living in the Netherlands and Sweden [18,19] A recent study focusing on children with pediatric PTSD also supports that traumatic stress is inversely associated with expressive language [20]. Similar with individual with PTSD, the association between working memory disadvantage and language skills are also found in children with autism [21]. From the indirect evidence, we speculate that language deficit in children with autism is associated with PTSD symptoms in infantile or early childhood.

In summary, all the core symptoms of PTSD could be observed in children with autism and the main symptoms of autism could be interpreted in the framework of PTSD. The traumatic events of children with autism experience are interpersonal trauma--especially, we proposed it is attachment related trauma. Fear rooted in the traumatic experience leads to avoidance to social interactions and in turn results

in the deficit in social functioning. The function of stereotype behavior is to establish a sense of control and to release them from stress. Sleep disturbance is associated with the hypervigilance symptom of PTSD. And the language deficit is also a result of PTSD.

Interaction of Trauma Exposure and Vulnerability

As described above, we propose that autism is PTSD on the infantile onset and it is associated with attachment related traumatic experience. Although there has been convincing evidence that traumatic experience such as early separation from caregivers and negative parenting has adverse effects on the mental health of little children [22-25], not all children having these experiences would develop autism spectrum disorders. It is important to identify innate vulnerabilities which interact with trauma exposure and contributing to the development of PTSD. Based on the results of previous research and our clinical observations, we proposed two vulnerable factors as following.

Enhanced but Imbalanced Components of Intelligence

There is increasing evidence that children with autism are actually highly intellect. These children show notable savant skills including calendar calculating, rote memory, mathematical computation, musical memory and realistic drawing [26-28]. They are usually scored higher in cognitive tasks which examine perception, spatial rotation capacity and visual reasoning [29,30]. Recent genetic research revealed that alleles for autism overlap significantly with alleles "for" intelligence and higher educational attainment [31-33]. In our example mentioned above, Lei could recognize more than one hundred Chinese characters at the age two.

There seems a paradox between these findings and the phenomenon that intelligence deficit is often presented in children with autism [34]. Crespi (2016) solved this paradox by proposing that children with autism have enhanced but imbalanced components of intelligence. These children have obvious reduction in social and verbal capacities, but have enhanced perceptual, spatial abilities. Savantism appears to represent an extreme of imbalanced components of intelligence in autism.

Crespi also proposed the enhanced and imbalanced developed intelligence is an important vulnerability of autism. As a contributor of high functioning of perception, sensory hypersensitivity is consistently observed in children with autism. They are more sensitive in various sensory modalities including vision [35], hearing [36,37] and touch [38,39].

Because of the hypersensitivity to sensory stimulation, children with autism usually are exposed in sensory overloaded situations. Sensory stimulus which is normal to typically developed children might be unbearable to them. They may exhibit great anxiety even panic in novel or stimulus-overloaded situations. The experience has been described vividly in the mirror anecdotal reports of the well-known autistic Temple Grandin: "to be lightly touched appeared to make my nervous system whimper, as if the nerve ends were curling up" [40]. It is thus understandable that children with autism avoid situations that are unpredictable or novel. If the active avoidance to experience is triggered too early, these children are unable to assemble elementary information into higher order concepts needed for abstract thinking and language [41]. In this case, intelligence and language ability could be negatively affected.

Sensory hypersensitivity could be innate which makes these

children to be easily traumatized and trapped in the painful experience: Traumatic stress symptoms could be triggered when exposure to ordinary or mild adverse events. From this point of view, we hypothesize that sensory sensitivity is a vulnerable factor that enhanced the association between traumatic experience and autism. In addition, PTSD could aggravate the manifestation of sensory hypersensitivity because of the hypervigilance symptoms.

Anxiety and Fear

A great number of studies have demonstrated that anxiety and poor stress management are common concerns in children with autism. These children have higher levels of anxiety compared with typically developed children [42,43] and are more likely to have anxiety disorders [44,45]. Anxiety is related with core symptoms of autism: higher level of anxiety is associated with greater repetitive behaviors [46]. Researchers also proposed that restricted interest is a maladaptive coping response to negative emotional experience such as anxiety [47]. Anxiety in children with autism may be rooted in the genetic susceptibility because it is commonly observed in parents and other relatives of children with autism and is considered an important feature of board autism phenotype [48,49].

In addition to anxiety, fear is another important emotion experienced by children with autism. Findings of recent research suggest that fear processing in autism is abnormal. Enhanced fear memory formation and a progressive generalization of fears were observed in an animal model of autism [50].

Results of previous research suggest that anxiety and fear in children with autism are associated with the sensory hyper-sensitivity [51,52]. They are natural emotional responses in sensory-overloaded situations. Furthermore, the magnitude of anxiety and fear could be amplified in autistic individuals because of hyper-emotionality [41]. In the intense world theory of autism, Markram and Markram (2010) proposed that hyper-emotionality is a potential risk factor of autism and the amygdaloid hyper-reactivity and hyper-plasticity is the neural basis of hyper-emotionality and may provoke a disproportional level of negative emotions such as anxiety and fear. This theory has been supported by some empirical evidence. For example, functional hyper-reactivity of the amygdale was demonstrated when autistic subjects are confronted with social cues such as faces and eyes [53-55]. Although they might be able to attend to social cues, experience emotions and empathize with others, but they avoid doing so because it is emotionally overwhelming and stressful.

Integrating the intense world theory of autism with our PTSD hypothesis, we propose that for children who have neural basis of enhanced emotionality, they view the surroundings with high alertness. They tend to over-evaluate threat and their fear and anxiety could be amplified when exposure to mild adverse events. Because of these features, children with autism have greater demand on stable and secure environment compared to typically developed children. A sensitive, warm and stable caregiver might comfort the child, provide the child with secure base and help him/her establish a sense of trust. However, "ordinary sensitive" parents usually have difficulties to understand demands of these children and fail to meet their needs. As a result, it is more difficult to form attachment security in children with autism. Meanwhile, these children are more vulnerable to attachment related trauma such as early separation with parents and frequent change of caregivers. Traumatic stress symptoms could be triggered by the attachment related traumatic experience.

Trauma Treatment to Children with Autism

Based on the hypothesis that attachment related trauma is an important factor for the development of autism and symptoms of autism are the results of PTSD, we follow the principle of trauma therapy in the treatment of children with autism.

In our intervention with children with autism, we focus on restoring the attachment between the child and the parents and re-establishing the sense of security and control in the child. Different from the mainstream treatment for children with autism, we do not deal with the autistic symptoms directly but emphasize on the work with parents.

First, we stress the importance of coping with negative emotions of parents such as anxiety, anger and frustration. As indicated by results of our previous research, negative emotions of parents could transmit to the child and aggravate symptoms of autism while positive emotions of parents could also make the child release and reduce the exhibition of autistic symptoms [56].

Second, we instruct the parents how to interact positively with the child because we consider that good relationship with parents is the basis of social skills to communicate with others. In order to increase the chance that the child has eye contact with the parents, parents should try to maintain positive facial expression. We lend support to the parents and work on their facial expression in the family therapy because the parents are usually traumatized by the child's condition and it is difficult for them to maintain positive. In addition, we discuss with parents on how to understand behaviors and motivations of the child so that they could be able to understand needs of the child better and provide appropriate comfort in the right timing. For example, if parents realize it is anxiety that under children's behaviors such as playing with hands, turning around and biting fingers, they would understand that it is important to remove the source of anxiety rather than restraining these behaviors. We insist that children with autism are sending out social signals although they are usually weak. Parents could be able to tell the signal and give appropriate feedback if they understand the behavior patterns of the child well. Understanding behaviors of the child could make the parents feel greater parenting efficacy and be less likely to be frustrated.

Third, we also emphasize to provide the child with stable, warm and simple family atmosphere as well as similar environment in the kindergarten and primary school. Because of the sensitivity to interpersonal threat of children with autism and their limited capacities to deal with stress, reducing social stimuli is important. In the initial stage, their interactants should be a small amount of people and parents are the best interactants. In our family therapy with autistic children, we aim to restore trustful attachment relation between the child and the parents and we think that the child could transfer this experience to the relationship with others when they feel less fearful and anxious with social interactions. In the kindergarten or the primary school, the autistic child should be permitted to keep a little further from other children and even leave the classroom whenever they feel uncomfortable in the premise of not disturbing others. Some principles in the school might be not applicable for children with autism. Because too much restraining of behaviors could increase their social burden and make them anxious. The autistic child would initiate the exploratory behaviors if he/she thinks the environment is safe.

Forth, regarding the recovery of language problems, we apply no special intervention. Based on our hypothesis that the deficit

of language is the result of PTSD, the language problems could be recovered automatically if the harmful effects of trauma have been eliminated. We observe this in the clinical cases that the language of children with autism redeveloped when the child feel safe enough with social relations. Therefore, we argue that what important is to heal the psychological trauma instead of introducing language ability training.

Conclusion

Compared with other interventions for children with autism, our intervention shares similar philosophy with the intervention described in the article "son-rise" in which the author kept an acceptable attitude to the child's symptoms, reducing social stimuli and paid attention to maintain good relationship with the child [57]. Based on this philosophy, we are against inappropriate usage of intensive behavioral training and insist that this kind of intervention might have adverse influence on the establishment of security and control.

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