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ESSAY

Neurobiological Changes Produced by Child Abuse Perpetuate the Cycle of Violence, Essay.

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ABSTRACT

Purpose: We hypothesized that neurobiological changes produced by child abuse (CA) perpetuate the cycle of violence. We searched for reports showing neurobiological and neuroendocrine changes in relation to children who suffer/have suffered CA.

Recent Findings: Chronic stress in children causes lesions in the limbic system that affect emotions and memory. Genetic variants, such as those found in the serotonin transport gene, appear to be the cause for the development of neurobiological resilience.

Excerpt: CA at an early age has devastating consequences on a child's brain, resulting in multiple psychopathologies and most importantly, perpetuating or repeating cycles of violence. This process occurs not only due to learned behaviors but above all, due to neurobiological changes experienced by abused children.

Keywords:

MESH: Child Abuse, Domestic Violence, Violence, Neurobiology.

Free Text: Cycles of violence, Neurobiological changes.

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INTRODUCTION

The problems associated with child abuse (CA) and its different forms have existed since the beginning of humanity but have only gained attention since the middle of the 20th century after the United Nations Declaration of the Rights of Children in 1959 and later with the Convention on Children's Rights in 1989 when legislation on the subject began. [1]

In Spain, for example, CA has been considered a crime since 1995 although the penal code at that time did not contain any article on child safety. Reforms and modifications in addition to deprivation of liberty are needed to suppress the exercise of parental authority.[2]

In Ecuador, the declaration of the 1989 Convention was ratified in 1990, and since then the laws have tried to put the "best interests of the child" into practice. Constitutionally, the Convention has been enacted through the Childhood and Adolescence Code. [3]

However, what is child abuse? In the text of "Meneghello Pediatrics", talk of a continuous process of abuse and neglect exists. These processes include not only beatings or physical damage but also abandonment, sexual abuse, and emotional stress of any kind in which the principle that "every child has the right to health and a life free of violence" is not fulfilled and allows thousands of children to be physically and mentally damaged with a high cost in lives and resources.[4] However, the definition of CA is not entirely clear, even more so when, for example, in the United States corporal punishment at home as a form of discipline is legal.[5] Now, to what degree can corporal punishment become mistreatment? The text "Nelson's Pediatrics" defines this threshold as "any injury that exceeds a transitory redness", [5] which undoubtedly can lead to subjectivity and even more so when corporal punishment used by one's ancestors as a form of education and discipline persists to this day in many cultures.

To make the definition of CA more concise, perhaps one can cite the definition of CA from the International Center for Childhood in Paris, which indicates this abuse as "the negligent, non-accidental action, omission, or treatment that deprives the child of their rights and of their well-being, which threatens or interferes with their orderly physical, mental or social development, whose perpetrators can be people, institutions or society itself".[6, 7]

According to the World Health Organization (WHO), one in four adults has reported having suffered some type of CA in childhood, [8] that is, 25 % of the population. However, without a doubt, the problem is much bigger than what is reported, not only due to under-reporting but also due to the lack of diagnoses in addition to the entangled complaint process to which the doctor or healthcare personnel may be exposed upon suspicion of an abused child. In addition, mistreatment, such as emotional abuse and or neglect that, being silent and hidden, have a poor chance of being detected also exist.

Despite being under-reported, these CA figures are not negligible, and we should really be concerned about why we are living in such a violent world. Therefore, the first questions should be asked: "Why do abusers and mistreated exist? Why are many of the abused children the product of parents who were also abused? What do we humans lack to become aware and understand that abuse, especially at an early age, is the tip of the iceberg that damages societies and makes this world a highly imperfect place?" In other words, it is probably the cycle of violence that is a vicious cycle and repeats itself generation after generation, thus perpetuating CA.

The most serious implication, apparently, is that it is possibly not so easy to break this cycle if neurobiological changes in many of the abused people that predispose them to be potential abusers occur, a finding that has been previously demonstrated.

DISCUSSION

To answer these questions, we must begin by analyzing what happens in the brain of children in the face of aggression.

According to recent research, it is known that chronic stress levels cause important anatomical, structural, and functional sequelae, especially in the fully developed brain.[9] In the same way, it is said that one of the most affected areas is the limbic system, which is the part of the brain in which emotions, such as fear, joy, anger, anger, and sadness are processed and responsses occur. It is known that the limbic system is not only important in the control of emotions but is also fundamental in processes, such as memory and in addition, playing an important role in the establishment of addictions since it has neural circuits related to pleasure and the reward.[11] Consequently, these data implicitly explain why patients with a history of CA are more prone to substance abuse and also, why abused children have poor performances in school among other multiple difficulties.

It is known that the chronic stress processes to which abused children are subject cause areas, such as the hippocampus, which has a high number of glucocorticoid receptors, to be overstimulated since the first response to stress is the increase in the production of glucocorticoids. As the final step in this process, a decrease in hippocampal volume occurs due to inhibition of neurogenesis in addition to a delay in myelination.[12] To confirm this fact, some studies with images have been carried out in which it was found that the volume of the hippocampus is 16% lower in women who have suffered sexual abuse.[9]

On the other hand, evidence of alteration of the amygdala has been found. The amygdala is a structure that is part of the limbic system. It is activated by the recognition of negative mood states and participates in the conditioning of fear and in control of aggressive and sexual behaviors. The amygdala appears to be very reactive in patients who have suffered child abuse. Therefore, aggressiveness and violent, uncontrolled behaviors could be explained by tonsillar hyperreactivity.[9] In the same way, studies carried out in patients with impulsive aggressiveness definitely show an exaggerated response by the amygdala to any stimulus that it considers threatening.[13] In addition, it has been determined children who have suffered neglect present chronic activation of the amygdala, which leads to an alteration of the prefrontal cortex. The prefrontal cortex is responsible for the executive functions, which are basically cognitive processes that allow the control and regulation of behavior, and any alterations therein would explain the aggressiveness of many of the subjects who have suffered abuse.[14]

Likewise, it is interesting to note that not only morphological changes occur but also neuroendocrine alterations in this cortex. One of the most significant among these is the alterations in levels of the neurotransmitter serotonin. This neurotransmitter has been proposed to inhibit impulsive aggression. It has also been shown that people with a chronic history of stress, who have also become violent and impulsive, have lower levels serotonin levels in the cerebrospinal fluid.[15]

Therefore, the cycle of violence can be explained. It appears that many abused children undergo neurobiological changes that make them become potentially abusive, thus repeating history over and over again. However, we must mention that some parents with a past full of abuse have a profile contrary to the abuser and that perhaps the aforementioned damages did not occur in these people or they probably had the ability to achieve resilience (an aptitude that some individuals possess to recover from damage and emerge stronger) necessary to break the circle of violence.

Ater observing and following birth a group of individuals from birth who had all the conditions to develop psychopathology or at least problems in their future, surprisingly and contrary to expectations, Munist found very successful people, not only in the field of personal and family stuatus but even as models for society, calling them invulnerable children. This term was later changed to resilient people and is used to call all subjects who develop and are psychologically healthy and socially successful despite adversity.[16]

However, resilience as such is not a static or absolutely innate phenomenon of the individual as it is closely related to the surrounding environment, that is, to protective factors that appear to oppose or reduce the effect of the trauma that caused the damage. These factors are generally the extended family, groups of good friends, teachers, psychologists, neighbors, and people with whom the child can feel and develop a bond of trust, security and/or love. Resilience would therefore be the most important factor in breaking the cycles of violence that all societies in the world ailently but agonizingly face.

It is also believed that genetic variants against CA exist, such as that of the serotonin transport gene and that these variants are the cause for the development of neurobiological resilience.[17] These variants could be considered as epigenetic mechanisms, that is, heritable changes in DNA organization, however, without involving changes in the structure of its nucleotides or bases. These changes are expressed in genes.[18] As a consequence and as indicated in the article, "Epigenetics of child abuse", the plasticity of the human genome has allowed it to respond favorably to environmental interventions and thus avoid damage thanks to epigenetic changes that manifest themselves positively in the individual.[19]

Now, after having learned that neurobiological modifications in the brains of children who suffer abuse exist, a new question could be asked, "what happens to those children whose brains were affected and failed to develop resilience?"

To respond, the psychological consequences or emotional traces left by CA in its different forms can be analyzed: (1) physical, (2) emotional and/or psychological, (3) neglect or abandonment, and (4) sexual abuse. Although all are potentially capable of affecting the mental health of the victim, it should be noted that they will depend on the frequency, intensity, and duration of the abuse. In any case, the secure affective bonds, which are necessary for the emotional well-being of all human beings do not exist or are broken, especially when a child is abused. As is the most frequent, the breaks develop in the family bond.[20]

This breakage leads to the fragility and psychological instability of the child with a profound deterioration of his/her self-esteem and their devaluation / depreciation as a person and manifests itself over a wide range of symptoms and signs, including serious and deteriorating psychopathologies. Thus, an abused child may present with decreased cognitive capacity with memory loss, poor performance in school, and attention deficit disorders[21] in addition to mood disorders, such as anxiety, depression, hostility, aggressiveness, oppositional defiant behavior, self-harm, and other psychopathologies, such as personality disorders, obsessive compulsive behavior, paranoid ideas, and substance abuse/addiciton.[22]

On the other hand, lately much progress has been made in the knowledge and recognition of post-traumatic stress disorder (PTSD) that develops after an acute or chronic traumatic assault at any time in life. However, it has been determined that when PTSD is the product of traumatic events in childhood, it is associated with major depression much more frequently than at other ages because apparently, when the aggression occurs early, a response of the type chronic inflammatory immune system that leads to severe depressive symptoms occurs. It should be noted that depression today has reached alarming rates, estimating that by 2050 it will be the second largest cause of disability.[23]

A recent study indicates that 56.3% of abused children need close monitoring and treatment, noting that, first, in sexual abuse followed by emotional abuse, the most important approach was treatment by mental health professionals, while in purely physical abuse, the necessary follow-up was by social services.[24]

The lacerating reality of CA is far from being overcome even more so when it must be approached and considered a social problem since society as a whole has a greater or lesser degree of responsibility. Poverty, unemployment, relationship conflicts, low educational levels, drug and alcohol consumption, psychiatric illnesses of parents, adolescent mothers, reconstituted homes, large families, and dangerous neighborhoods are, among others, the aspects of

violence that should be attributed to society. In addition, it should be noted that the child himself/herself may present certain characteristics that make him/her more vulnerable to being abused, especially children with difficult temperaments and those who require special care, such as children with disabilities.[25]

CONCLUSIONS

Societies continue to foster differences and the lack of respect is increasingly evident. Sexual abuse is news every day, bullying, teenage pregnancy, drug use, suicide, prostitution and child labor often go unnoticed without trying to understand or analyze what is happening and what can be done so as not to be accomplices of a decadent society that has practically done nothing to solve this reality. If it is also known that not all these children will be capable of developing resilience, the neurobiological changes analyzed will definitely make thousands of children walk silently but firmly to prolong or perpetuate these cycles of violence that do so much damage and will continue to do to the whole of humanity.

ARTICLE ADMINISTRATIVE INFORMATION

Abbreviations

CA: Child Abuse.

PTSD: post-traumatic stress disorder.

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Originality of the article

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