The Effects of Trauma on the Brain

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THE RESEARCH PAPER

“The Biological Effect of Childhood Trauma”
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Terms & Definitions

- Epigenetics: The study of changes in organisms caused by modification of gene expression rather than alteration of the genetic code itself.

- Psychopathology: the scientific study of mental disorders (PTSD, depression, etc.).

- Cognitive: relating to, being, or involving conscious intellectual activity (such as thinking, reasoning, or remembering).

- Post-traumatic stress disorder (PTSD): a mental health condition that is triggered by a terrifying event (either experiencing it or witnessing it). Symptoms may include flashbacks, nightmares and severe anxiety, as well as uncontrollable thoughts about the event.
Introduction

Little is known about trauma's neurobiological, genetic, and epigenetic effects in children as compared to adults with trauma histories. Ultimately, the researchers are trying to understand the neurobiology and genetic influences of childhood trauma on child development. Common childhood traumas include accidents, bullying, terrorism, exposure to war, child maltreatment (physical, sexual, and emotional abuse; neglect) and exposure to domestic and community violence. They will compare the victims' stress biology compared to those children who have not experienced trauma. They believe these differences are likely the causes of the greater rates of psychopathology and of common medical disorders (cardiovascular disease, obesity, etc.) seen in child victims.
Effect of Childhood Trauma on Cognitive Development

Childhood PTSD followed by witnessing interpersonal violence has been associated with lower levels of performance on the California Verbal Learning Test (Children's Version) when compared to those without PTSD.

On the NEPSY Memory for Faces Test, Group B had a lower performance level than Group A and Group C. This indicated that PTSD is associated with an impaired consultation of memory.
The temporal lobes (which regulate emotions and receives input from the senses) are nearly inactive in Brain 2. These children suffer from emotion and cognitive problems due to extreme deprivation & neglect during infancy.
Methods

- Held a large study of 61 youth (31 males and 30 females) with PTSD and who experienced abuse (also had similar trauma and mental health histories) and 122 non-maltreated controls (62 males and 60 females)
- The maltreated and control children had no history of substance abuse or dependence, thus excluding confounds that were typically seen in maltreated children
- The maltreated and control children also had no pregnancies or birth trauma
- Magnetic Resonance Imaging (MRI)
Results

❖ The midsagittal area of the corpus callosum subregion 7 (splenium) was smaller in both males and females with maltreatment-related PTSD compared to their gender-matched comparison subjects.

❖ The corpus callosum ensures that both sides of the brain can communicate and send signals to each other.
Future Applications

This research paper indicated that there are two opportunities to break the cycle of maltreatment.

- First opportunity: to aid in fostering a loving and caring environment for their child and to avoid the neurobiological consequences of childhood maltreatment
- Second opportunity: to treat victims of maltreatment

This understanding of the neurobiology childhood trauma on child development can lead to novel and effective approaches to treatments like personalized medicine.
Interesting Facts

- Maltreated subjects with PTSD had a 7.0% smaller intracranial and 8.0% smaller cerebral volumes than non-maltreated children.
- Almost half of child onset mental disorders and about a third of adult onset mental disorders are preceded by child abuse and neglect, and family dysfunction.
- Maltreated children in foster care showed less self-destructive behavior, substance use, and total risk behavior problem standardized scores and higher grades than maltreated children who were reunified with their biological families.

Before reading this research paper we didn't what the effects of trauma were on the brain. We learned how it changes the biological structure of the brain and how it can lead to serious damages.
Thank you!
We hope you enjoyed!