SCIENCE – IN THE NEWS

Post-Traumatic Stress in Children

In the past it was commonly believed that children did not develop post-traumatic stress disorder (PTSD), that they had only brief responses to traumatic stress and were able to put the experience behind them. However, when children are asked about a traumatic event they experienced, their recall is accurate, and their reactions indicate they are re-experiencing the trauma (1). PTSD occurs as the result of an inescapable threat to life such as the effects of war, terrorism, natural disasters, accidents, disease and sudden death of a loved one and can cause lasting neurological and physiological changes to the brain.

Exposure to stress in early childhood may change the volume of certain brain structures associated with learning and memory. Children unable to cope with the traumatic events they experience often suffer from depression, anxiety, and/or pathologic grief as a result of the experience (1). Recent studies suggest that these comorbid symptoms could be responsible for a decrease in hippocampal volume (2). In traumatized subjects, the volume of the hippocampus has been found to be smaller than the hippocampal volume of a control population (3,4). A decrease in hippocampus volume has been correlated with memory deficits, dissociative symptoms, depression, and PTSD (2). Thus, structural changes in the brain may underlie changes that contribute to psychological illness.

At the cellular level, the process of storing behavioral memories could contribute to alterations in the structure of DNA (5). The memory storage pathway in the hippocampus – the extracellular signal-regulated kinase (ERK)/mitogen-activated protein kinase (MAPK) pathway – has been shown to modify chromatin during memory consolidation (5). Since remodeled chromatin can be passed on transgenerationally, the children of parents with PTSD may also be at risk of developing behavioral disorders (2).

Better education, social support, and well investigated pharmacological intervention are needed to combat the effects caused by traumatic events. Children exposed to traumatic events may not be able to understand what has happened to them, and therefore, may not be able to resolve the trauma. The impact of the exposure on children has the potential to leave long-lasting physical and psychological scars that can affect their healthy psychological development and quite possibly the next generation. – *Julia Baumann*

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