**Abused Children May Get Unique Form of PTSD**

By [Maia Szalavitz](http://healthland.time.com/author/maiasz/)April 30, 2013



Joe Mikos / Getty Images

[Child abuse](http://topics.time.com/child-abuse/) scars not just the [brain](http://topics.time.com/brain/) and body, but, according to the latest research, but may leave its mark on genes as well.

The [research,](http://www.pnas.org/cgi/doi/10.1073/pnas.1217750110) which was published in the *Proceedings of the National Academy of Sciences,* suggests that abused children who develop post-traumatic [stress](http://topics.time.com/stress/) disorder (PTSD) may experience a biologically distinct form of the disorder from PTSD caused by other types of trauma later in life.

“The main aim of our study was to address the question of whether patients with same clinical diagnosis but different early environments have the same underlying biology,” says Divya Mehta, corresponding author of the study and a postdoctoral student at the Max Planck Institute of Psychiatry in Munich, Germany.

To find out, Mehta’s team studied blood cells from 169 people in Atlanta who were participating in the Grady Trauma Project.  Most were in their late 30s to mid 40s and were African American; some had been abused as children but all had suffered at least two other significant traumatic events, such as being held at gun- or knife point, having a major car accident or being raped. On average, the participants experienced seven major traumas. Despite these events, however, the majority were resilient: 108 participants never developed PTSD.

Among the 61 that did, 32 had been abused as children and 29 had not.  The authors examined their blood cells, looking for genetic changes that distinguished people with the disorder who had been abused from those who had not. To focus on changes associated with PTSD diagnosis rather than trauma exposure alone, they looked for differences not seen in the resilient group.

These genetic alterations are known as epigenetic changes: chemical differences that don’t mutate the DNA itself but affect how actively and efficiently the genes are made into proteins. By either silencing or activating genes, epigenetic changes can influence everything from brain development and functioning to the risk for certain diseases. While not necessarily permanent, some of these changes can last a lifetime and some can even be passed on to the next generation.

“In PTSD with a history of child abuse, we found a 12-fold higher [level] of epigenetic changes,” says Mehta.  In contrast, people who experienced trauma later in life showed genetic effects that tended to be short-lived, and did not permanently alter the function of the genes.

“It’s a very interesting paper,” says Moshe Szyf, professor of pharmacology and therapeutics at McGill University in Montreal, Canada, who studies epigenetics. “The important thing about this paper is that it looks at PTSD that has different life histories. One group has a life history of child abuse and the other doesn’t and we see a completely different functional genomic appearance.”

Understanding the different ways that people can develop PTSD could have implications for how the condition is treated. The epigenetic changes were mostly different between the two groups, even if both sets of aberrations ultimately resulted in PTSD, suggesting different ways to potential treat the PTSD depending on its origins.“This study implies that it is essential to take into account the trauma history of an individual,” says Mehta, “Individuals with the same diagnosis might need different treatments depending on their environmental endowments together with their genetic predispositions.”

Indeed, at least with depression, which is another condition with links to traumatic experiences, some studies found that a childhood history of maltreatment was associated with a [reduced](http://www.ncbi.nlm.nih.gov/pubmed/22420036) response to antidepressants and some other therapies.

“The question is, if indeed the problem is in the DNA, can we reverse this program and do we have tools to reverse that?” says Szyf. “I’m very interested in that and we’re doing some experiments in animal models.” The group is using drugs that can affect gene expression, such as some cancer treatments, for example, to figure out whether they can help to reverse harmful epigenetic changes like those leading to PSTD-like symptoms in animals.

Dr. Elisabeth Binder, the principal investigator of the current research and research group leader at the Max Planck Institute, says, “If individuals have been abused as children, they end up having psychiatric diseases that might be biologically different. The way you got to the disease is as important as the disease itself.”

Still, since the researchers compared child abuse to other types of trauma that typically occurred when participants were in their early 20s, Mehta says it’s impossible to say whether it was simply the early timing of the child abuse or something unique to being mistreated by caregivers that accounted for the different pattern of changes she and her colleagues found. Other research showed both that early trauma is particularly significant and that child abuse can have an especially pernicious effect on the developing brain, but it’s hard to disentangle them. In addition, it’s possible that early trauma and the damage associated with it work synergistically in contributing to the response to trauma. For example, studies on [Romanian orphans](http://healthland.time.com/2012/07/24/the-lasting-effects-of-neglect-altered-brain-structure-in-children/) show that the longer an infant is kept in an abusive and neglectful setting, the greater the damage to IQ and the higher the risk of psychiatric problems.

Whether these genetic markers can reliably be related to childhood trauma and then used to help guide treatment, isn’t clear yet. But the results suggest that such refined strategies might at least be possible. Depending on the patient’s experience, for example, trauma linked to childhood abuse may respond better to certain drugs acting on one pathway, while adult-onset trauma, such as being a victim of rape, might require targeting a different set of genes or proteins.  The more we understand how trauma does harm, the better able we will be to reverse the damage or even actually prevent it from causing disease.

Read more: <http://healthland.time.com/2013/04/30/abused-children-may-get-different-form-of-ptsd/#ixzz2VAb3fHFd>