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Childhood Abuse Disrupts Brain Formation: Harvard Study Says

By Elizabeth Lopatto

Childhood abuse leads to permanent changes in a seahorse-shaped area of the brain that can cause adult depression and drug abuse, Harvard researchers said in a study that raises the possibility of new treatment.

Brain scans of adults who averaged 22 years old showed differences in a part of the brain where new neurons are generated, according to the study today in the Proceedings of the National Academy of Sciences. People exposed to childhood abuse were found in the study to have a less-dense hippocampus.

About 3.7 million U.S. children are assessed yearly for abuse, and the number may be higher because some cases don't come to light, studies show. Today's findings may provide hope for treatment because the brain is still growing throughout early adulthood, said **Martin Teicher**, a psychiatrist at Harvard Medical School in Boston. Mental illnesses caused by childhood mistreatment may take years to develop.

"If you know there's exposure, maybe there's time to intervene," Teicher, a study author, said by telephone.

The hippocampus is known to be less active in people who are depressed or schizophrenic.

Drugs such as antidepressants and anticonvulsants, and lifestyle changes including vigorous exercise, prompt the formation of new neurons, Teicher said. The new neurons may blunt the effects of abuse and decrease the risk of adult illnesses including depression and anxiety.

Child Abuse Cost

Such treatment would also save society money, Teicher said. The cost associated with one year of child abuse is about \$124 billion, according to the Centers for Disease Control and Prevention. Childhood abuse costs each person about \$210,000 extra over a lifetime, including about \$32,600 in childhood health-care costs and \$10,500 in adult expenses.

In today's study, 193 un-medicated people underwent MRI brain scans. They were also asked questions about childhood. About a third of the respondents experienced physical abuse, while another third witnessed domestic violence.

The research showed that those who experienced or witnessed the abuse had an average of 5.8 percent to 6.5 percent reductions in the volume of the hippocampus, which is involved in processing emotion and memory. Studies have indicated that this brain region is very vulnerable to stress, Teicher said.

"What's really going on is these changes are a consequence of childhood abuse," said Teicher, who is also affiliated with **McLean Hospital**. It is part of an accumulating body of evidence that shows there are physical effects from being raised in an abusive household.

A 2009 study in Nature Neuroscience found that people who were abused or neglected as children were more biologically sensitive to stress. Other research has shown that abuse may shorten life expectancy by as much as 20 years, and 2009 study in Biological Psychiatry showed a link between abuse and early cellular aging.