Kids' response to stress depends on family environment

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Washington, Feb. 21 -- A new study has revealed that the genetic and environmental bases of hormonal response to stress depend on the context in which a child grows up.

The research, led by Universite **Laval** professor of psychology Michel **Boivin**, studied 346 19-month-old twins.

The study showed that for children growing up in a favorable family environment, genetics account for 40 percent of the individual differences in cortisol response to unfamiliar situations.

Cortisol is a stress hormone produced in new, unpredictable or uncontrollable contexts.

Contrary to this, if children are raised in difficult family circumstances, the environment completely overrides the genetic effect as if it had established a programmed hormonal conditioning to stress.

The researchers already assumed that variability in cortisol production among individuals exposed to the same stressful conditions depended on both genetic and environmental factors.

In order to estimate precisely these genetic and environmental contributions, they studied 130 identical twins who share 100 percent of their genes and 216 fraternal twins who share close to 50 percent of their genetic makeup.

Each child, accompanied by its mother, was brought into a room, and then successively exposed to a clown and a noisy robot.

"These are not traumatic events, but they are sufficient to cause behavioral changes in most children of that age," **Boivin** said.

The researchers measured cortisol levels in the children's saliva before and after this experience and analyzed this data as a function of each child's family environment.

Specific risk factors, such as tobacco use during pregnancy, low family income, low education level, single parenthood, very early parenthood, low birth weight, maternal hostility toward the child, have known effects on cortisol levels in children.

Almost a quarter of the families who participated in the study had at least four of these risk factors and were classified in the "difficult family context" category.

The data indicate that genetic factors account for 40 percent of the individual variability in cortisol response among children from a favorable family background, but this contribution drops to zero in children growing up in difficult family circumstances.

Boivin contemplates that the study confirms the importance of intervening early with families to reduce the risk of a disrupted conditioned stress response in young children.

"A transient rise in cortisol level is a normal response to stress. But continuously high levels of this hormone could be harmful to the child's development in the long run," the researcher said.

The study is published in the Archives of General Psychiatry.

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