

What About The Children?



RESEARCH SUMMARY

Association between plasma IL-6 response to acute stress and early-life adversity in healthy adults.

Carpenter, L.L., Gawuga, C.E., Tyrka, A.R., Lee, J.K., Anderson, G.M. and Price, L.H. *Neuropsychopharmacology* (2010), 35, 2617-2623.

Serious adverse events in early life, such as emotional, physical or sexual abuse, or emotional or physical neglect, are increasingly becoming associated as risk factors for health problems in later adult life. The next step of the problem of relating risk factors to a physiological condition is to identify a biochemical marker that is clearly linked to the particular disorder. This paper examines changed blood plasma levels of a biochemical marker (plasma is the liquid part of blood remaining when the red cells have been removed), interleukin-6 (IL-6), that is involved in the inflammatory response, to experimentally induced stress. IL-6 is a small protein belonging to a family of proteins called cytokines that are involved in chemical signalling between cells; it is particularly important in the immune system and any increase in its levels raises the probability of developing inflammatory disorders.

Two groups of adults were studied: a control group with no known adverse events in early life, and a group that had various types of abuse or neglect in childhood. An intravenous cannula was used to measure plasma IL-6 levels; a period of 2 hours 45 minutes was allowed for the patient to settle after its insertion, before the tests started. Each group was then given two standard psychosocial stress challenges, and the plasma IL-6 levels determined at 15 minute intervals over a period of 90 minutes. The psychosocial stress tests consisted of: (i) the patient had to give a speech about the qualifications for their own vocation, with only 10 minutes being allowed for preparation of the speech: (ii) a mental arithmetic test whereby the patient had to serially subtract 13 from a given starting number and speak out the answers. The two tests lasted a total of 30 minutes. Both tests were performed in front of a panel of confederate judges.

There were 50 patients in the control group with a mean age of 24.5 years and 19 patients in the maltreated group with a mean age of 32.8 years. IL-6 values were adjusted for each patient's Body Mass Index which is a known factor that modifies IL-6 levels.

At the outset of the tests, IL-6 levels in the two groups were statistically the same. Throughout the 90 minute period after the start of the stress test, plasma IL-6 levels rose progressively. At the end of the 90 minute measurement period, the IL-6 levels were raised by 70% in the maltreated group compared with IL-6 levels in the control group which were not significantly raised. This difference between the two groups was statistically highly significant.

The cytokine cell signalling molecules, such as IL-6, have been known to be part of the biochemical responses to physical stress. This pilot study suggests that the cytokine IL-6 response can also be initiated by psychosocial stress and that this response is enhanced in patients with a history of early-life adversity. This paper on psychosocial stress measurements in adults has signalled childhood maltreatment and neglect as an important variable for stress responses. This work merits further investigation to a larger sample and an exploration of other factors involved in the immune response, but it appears that those exposed to early life neglect and abuse may be exposed to a greater risk of inflammatory disorders in adult life.

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