

What About The Children?



RESEARCH SUMMARY

The Differential Impacts of Early Physical and Sexual Abuse and Internalizing Problems on Daytime Cortisol Rhythm in School-Aged Children

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The presence in all societies of children suffering from deprivation, neglect and abuse, however deplorable, provides researchers with a population in which the effect of such adverse circumstances on their later biological and psychological functioning can be studied. Such children face multiple difficulties, among which is an increased risk of major depressive disorders and other “internalizing” problems. Many studies have investigated the link between child maltreatment and subsequent depression, postulating a variety of mediating factors, including genetic variation, the type of maltreatment, the quality of the child’s family and other supportive relationships, and stress hormone activity.

The links between stress hormones, fear and depressive symptoms have been well explored both in humans and in animal models. Many animal studies have shown that adverse care in early life increases behaviour associated with fear and anxiety, and that this is linked through the hypothalamus-pituitary-adrenal axis (HPA axis), which is involved in the normal stress response. Differences in the secretion patterns of hormones in this axis, particularly cortisol, have been observed in studies of both maltreated children and adults with depression. Few studies of this type, however, have distinguished between the effects of different types of maltreatment. Now researchers from the Universities of Minnesota and Rochester in the USA, led by Dante Cicchetti from the Institute of Child Development in Minnesota, have investigated the rhythm of cortisol secretion and extent of depressive symptoms in groups of maltreated children, segregating them by the type, age of onset and duration of maltreatment. They found that the diurnal cortisol rhythm was disrupted only in children who had suffered from physical or sexual abuse in the first five years of life and who were also showing significant depressive symptoms.

Cicchetti and his co-workers studied a total of 553 school-age children from low socio-economic groups in the setting of a daily summer camp. Approximately half the children had been maltreated, and these children were subdivided according to the type or types of maltreatment: neglect, emotional maltreatment, physical and sexual abuse. Sixty children who had suffered from physical and/or sexual abuse starting before the age of five (early physical and sexual abuse, EPA/SA) were distinguished from the other groups of maltreated children. It was noted, however, that there could be no complete separation of the groups because although many children are neglected without being seriously abused, few suffer from early physical and sexual abuse without also experiencing neglect.

The children were studied over a period of a week. Samples of saliva were taken from each child twice a day, on arrival at the camp (at 9a.m.) and again just before leaving. The cortisol concentration was measured in each sample and averaged to obtain one

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morning and one afternoon mean reading for each child. The extent to which each child showed internalizing and depressive symptoms was assessed both by child self-report and by counselors. For the first, children were asked to complete the Children's Depression Inventory (CDI), a simple, widely-used questionnaire; for the second, the camp counselors assessed the children using the Teacher Report Form (TRF). The two scores were combined into a single score for each child, but children with high scores for depression on either or both were regarded as symptomatic. Using this criterion, just under 20% of the children fell into this class. The percentage of children exhibiting depressive symptoms was higher in the maltreated group than in the control group, and this effect was significantly larger in the fairly small group of children that had suffered from EPA/SA. There was a positive but slight correlation between the scores obtained using the CDI and the TRF. The correlation between the nature and type of maltreatment, the incidence of depressive or internalizing symptoms, and diurnal cortisol rhythm was assessed using analysis of covariance (ANCOVA) with the age and gender of the children as co-variables. The most significant finding was that there was a significant difference in diurnal cortisol pattern only in those children who both exhibited significant symptoms of depression and had suffered from EPA/SA. Children who had suffered only emotional maltreatment and/or neglect, those whose abuse had started later in life, and those who had suffered from EPA/SA but had no significant depressive or internalizing symptoms did not show this pattern.

Children who both suffered from EPA/SA and showed depressive symptoms differed from the other groups in having lower concentrations of cortisol in their saliva on arriving at camp and higher cortisol concentrations on leaving. Although neither of these differences was significant, they added together into a significant difference in the decline between the morning and afternoon values. Over all the groups, girls showed a steeper diurnal decline in cortisol levels than boys, arising from lower afternoon values, and older children showed a steeper decline than younger ones arising from higher morning values. The observed difference in the depressive and EPA/SA group did not vary with either gender or age.

In normal children, cortisol secretion reaches a daily peak approximately half an hour after waking and then decreases to a minimum at bedtime; lower decreases have been associated with severe stress. It is particularly remarkable that such a significant stress-related pattern was observed in depressed and abused children because the day-camp setting limited the sampling times. It is very likely that all the children had their morning samples taken significantly after the peak on waking and the afternoon ones significantly before the nadir. There are still questions over why there is a difference between physical and sexual abuse and even severe neglect, and why the age at which the abuse occurs is so significant. It will be important to follow children like those in the depressive / early abuse group in this study to see the extent to which this dysregulation in stress hormones predisposes to depressive illness later in life. Depression is a multi-factorial illness, and it is possible that the chronic stress experienced by these children very early in life has made them vulnerable to one particular subtype. It seems clear, however, that intervention to prevent child abuse should take place as early as possible in a child's development in order to minimize the risk of severe problems developing at school age and later in life. *Dr C. Sansom*