

What About The Children?



RESEARCH SUMMARY

Mother Superior? The Biological Effects of Day Care.

Sigman, A. (2011)

The Biologist. 58, 29-32.

This paper from the Endocrinology section of the journal "The Biologist" caused considerable controversy when published in 2011. In anticipation of this, the author wrote an introduction that stated "The express intent of this article is to provide readers with the under-acknowledged and often uncomfortable findings of bioscience studies on daycare....the intent is to redress an existing imbalance in the perception of daycare as a 'complex, waiting to be understood – but at the moment benign' lifestyle practice." Dr Sigman continued by adding "While of course the long-term effects of daycare and cortisol release are not fully understood, emphasising the possible negative implications in keeping with our tradition of a principle of precaution is justified and prudent. In the case of early child care we should remind ourselves that when it comes to an issue of such fundamental importance, we must invoke the Hippocratean medical principle of "first do no harm."

This review paper collates much of the present research on the effects of institutional day care on the mental and physical development of toddlers. Aric Sigman begins by making the distinction between childcare and day care. Childcare is the natural process that has been going on within family structures of traditional societies for centuries; 'affordable day care' is a relatively new creation in society whereby children are passed into the care of others, usually outside the parental home, in day nurseries. Half of British mothers return to work before their child is 12 months old. In recent years, there has been a shift from studies based on child psychology that has focused largely on skill sets achieved by children in day care, to the emotional development of children that are affected by the day care environment. There is growing evidence that children in day care show elevated stress hormone levels throughout the day. The concern is whether this persistent exposure to stress has long-term consequences for mental and physical health as the child matures to adulthood. The key stress hormone is cortisol and, fortunately, it can be measured simply from saliva swabs. Cortisol is a useful hormone involved in short-duration stress management. Problems occur when stress is chronic and persistent; in these cases the cortisol exerts detrimental effects through dysregulation of the HPA axis, the hypothalamic-pituitary-adrenal axis, a key brain pathway enabling us to respond to fear, anxiety, separation-stress and threats and regulates the body's responses to these problems. When this system becomes disordered, an individual's self-control and related coping mechanisms are reduced in efficacy.

Elevated cortisol levels are associated with stress-related disorders such as depression and anxiety; also linked to persistent high levels of cortisol are increased numbers of plaques in arteriosclerosis of the carotid arteries (Dekker *et al.* 2008) and

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structural alterations in the brain's amygdala (Sharpley and Bitsika 2010). Experiments on non-human mammals enable researchers to perform invasive experiments to investigate brain changes in offspring that are related to different maternal care scenarios. Animal offspring from less attentive mothers show measurable differences in brain cell size and cell density within the hippocampus, an area of the brain that is susceptible to long-term stress. Functional magnetic resonance studies show that in humans, attachment insecurity is similarly linked to these changes in the hippocampus, and with severe neglect and maltreatment of a child their hippocampus is considerably reduced in size.

Does the care environment affect cortisol levels? Children from full-time professional home-based care show small increases in cortisol levels rising from 12 to 13 units during the care day, compared with rises of from 13 to 19 units found in children at day-care centres. In this latter group, 40% of children were classed as showing a stress response. Does this difference in home-based day care versus centre-based day care affect biological responses in later life? At 15 years of age, differences between the two groups are observed in levels of cortisol on waking. Centre-based day care children appear to be more prone to stress in their teen years. In general, centre-based day care offers a lower quality of care when compared with professional home-based care.