RESEARCH SUMMARY

Deviations from the Expectable Environment in Early Childhood and Emerging Psychopathology

Kathryn L. Humphreys and Charles H. Zeanah
Neuropsychopharmacology Reviews (2015) 40, 154-170

Physical responses to stress are believed to contribute to disease development. Individuals have different genetic responses to stress, as well as environmental supports and stressors. 'Toxic stress' is a cumulative effect of multiple, chronic events which disrupt developing brain circuitry and other organ systems and has long-term implications for physical and mental health. Stress from adverse experiences in early development can overwhelm a child's ability to cope and adapt.

The researchers looked at both lack of necessary adult input caused by neglect and deprivation, and also harmful input such as abuse and trauma. Both of these have a significant influence in the crucial early years of life. The plasticity of the human brain in early life is a key feature of human development, with environmental experiences playing a key role in infant brain development. Brain development occurs through both general processes that everyone experiences, such as language, and through information that not everyone experiences in the same way, such as one's native language. The quality of early experiences on brain development has a direct impact on the brain's plasticity. The heightened plasticity of an infant's brain is believed to reflect key periods in development when the brain is particularly affected by environmental input. The first three years of life are vitally important for cognitive, affective and social development. The relationship between parent and child plays an essential role in helping infants regulate their physical and emotional responses to stress. Infants typically form attachments to a small number of caring adults in their early years of life. The quality of these attachments depends on the child's experiences with their carers. Absent or neglectful carers do not provide the necessary experiences that help children develop many of the skills they need such as language development and social competence. Children who are neglected or abused are at risk of outcomes from ineffective emotion regulation.

This review examined three longitudinal studies of adverse early caring. The first was a prospective study of 4900 children who were abused and/or neglected before the age of 12 years. The second studied young children adopted from Romanian institutions for young children soon after the fall of Ceausescu, the children being placed in large institutions with material and social deprivation after having being abandoned at birth. The third study was a randomised controlled trial of foster care as an alternative to institutional care among 6 to 30 month old children who were abandoned at birth and placed in Romanian institutions, with half the children randomised to foster care and the other half to institutional care.

Both the structure and function of the brain are altered in children who are currently, or were formerly, institutionalised for significant periods after the age of six months. They are also affected by harmful input.

Four areas of psychopathology were examined for the effects of neglect/deprivation and abuse/trauma. These were indiscriminate behaviour, post-traumatic stress disorder (PTSD), attention deficit hyperactivity disorder (ADHD) and conduct problems.

Indiscriminate behaviour can be defined by a lack of reticence in interacting with unfamiliar adults and violation of social boundaries. This is characterised by young children who happily engage socially with unfamiliar adults, wander away from their carers in unfamiliar settings and show willingness to accompany strangers without hesitation. In pre-school children it can also manifest as attention seeking behaviour, over-bright emotional displays and violation of others' physical and verbal boundaries.

It is one of the most common social abnormalities seen in young children in institutions, in those adopted out of institutions and in maltreated children in foster care. Around 10-20% of seriously deprived children are estimated to show signs of indiscriminate behaviour. Social neglect is considered to be central to indiscriminate behaviour and is almost always associated with children with a history of severe neglect. It is questionable whether social disinhibition is a manifestation of general difficulties with inhibitory control, which is also identified in children raised in institutions. Children adopted from institutions showed reduced discrimination between mothers and strangers, with more prolonged periods in institutions linked to more indiscriminate behaviour.

There is no evidence that physical or sexual abuse alone lead to indiscriminate behaviour. It is unclear whether serious psychopathology in mothers contributes to children's indiscriminate behaviour or if the absence or presence of specific behaviour matters more. Another form of abnormal input which may be implicated is mothers' disrupted emotional interactions with their infants – such as communication errors, negative remarks and withdrawal - which were also linked with indiscriminate behaviour.

Posttraumatic stress disorder involves several signs and symptoms that appear after an individual's exposure to a traumatic event or a series of events. These may include witnessing the death or threat of death of another, actual or threatened serious injury or actual or threatened sexual abuse to self or other. Even children as young as one may show evidence of symptoms after exposure to traumatic events.

Neglect can be associated with developing PTSD, for example by co-occurring with physical abuse, witnessing partner violence or other frightening experiences. Early childhood neglect may predispose an individual to internalising disorders which then render them more susceptible to PTSD following a trauma.

Experiences of abuse are by definition considered traumatic. In children, trauma severity is most strongly associated with risk of developing PTSD and in young

Website: http://www.whataboutthechildren.org.uk: **Tel:** 0845 602 7145
What About The Children? (***WATCh?***): Company No. 5252973 - Reg. Charity No. 1108816

children traumas that threaten the carer are associated with more severe post-traumatic symptomatology.

Traumas activate two different stress response systems, both of which are normally adaptive, but prolonged or excessive activation can have a number of negative effects on physical and mental health, including symptoms of PTSD. Abused children demonstrate one of the key symptoms of PTSD, which is vigilance to threat in the environment.

Attention-deficit hyperactivity disorder comprises inattention, impulsivity and disorganisation and/or hyperactivity. It is found at significantly higher rates among youth who have been investigated by child welfare agencies, at 19%, compared with a prevalence of 5% in the general population.

Girls with ADHD are significantly more likely to have been neglected than those without ADHD. It is also highly prevalent among children who experience severe neglect in institutional care. The length of the deprivation appears to be linked to ADHD symptom severity.

ADHD is also likely to be higher in children who have experienced abuse and trauma. Girls with ADHD were significantly more likely to have been sexually abused. Rates of trauma exposure were highest in individuals with both ADHD and oppositional defiant disorder, which indicates a potential causal role in the association between trauma and disruptive behaviour disorders. Attention problems experienced following abuse may be related to poorer coping.

Although there is a strong genetic base for ADHD there is suggestion of an environmental role in ADHD from the fact that enhanced positive caring reduces ADHD symptoms. Mother-child interventions have been shown to decrease ADHD symptoms in behaviourally disordered children. Children in higher quality foster care had significantly lower levels of ADHD than those in less supportive care.

Conduct problems include oppositionality, aggression and rule violating behaviour. These may manifest as early as 3 years of age. There is evidence for moderate to high levels of heritability for conduct problems and related traits, although environmental factors should also be considered.

Early negative experiences, including living in poverty and harsh and especially coercive parenting, are known risk factors for conduct problems. Trauma, specifically, has been linked to conduct problems. Individuals who experience abuse or neglect in the pre-school years are significantly more likely to meet criteria for antisocial personality disorder in adulthood than those who experienced maltreatment only during infancy (defined as under 2).

Children who are neglected in the first two years of life show high levels of aggression towards peers at four, six and eight years. Findings on the relation between institutional care and conduct problems are mixed. However, children adopted after two years of age were more likely to show aggressive and delinquent behaviour than

those adopted at an earlier age. Increased conduct problems have also been shown in previously institutionalised children. There may be a ‘sleeper effect’, with externalising psychopathology emerging later in development after institutional rearing.

Abuse and trauma have been shown to be related to conduct problems. Both lead to higher levels of Oppositional Defiant Disorder and conduct problems. Physically and sexually abused children are more likely to bully others. Parenting behaviours are linked to the onset and maintenance of children’s aggressive and delinquent behaviours. Both emotional and physical abuse in the early years are linked to aggression and externalising symptoms - a set of behaviours that manifests in children's outward behaviour, reflecting negatively on the child's external environment. These behaviours develop in school-age children who have been abused, with greater abuse severity leading to increased symptoms. Children who experienced physical abuse before five years had higher levels of externalising behaviour.

Environmental factors are thought to have a major role in the emergence of conduct problems. It is likely that the disruption of stable relationships for children in multiple foster care placements results in increased aggressive or defiant behaviours. Stable placements in high quality homes may reduce conduct problems.

Neglect, physical abuse and sexual abuse all predict emotional dysregulation which predicts externalising symptoms. There is a stronger association in children who are maltreated in infancy or toddlerhood than those maltreated in preschool or school age period. Those who are neglected or physically or sexually abused also show higher levels of overt aggression, which is likely to be related to poorer emotional regulation. Another factor may arise from attachment problems, as indiscriminate social behaviour in early childhood predicts hostile behaviour at age five.

Many children experience both harmful and inadequate input, with the lack of an attentive carer reducing the potential for buffering stressful experiences. Negative input impacts the developing brain, but so too does positive input. Positive environmental input matters regarding influencing psychopathology as well. Both inadequate and harmful input have profound effects on the risk for subsequent psychopathology, with both leading to abnormal brain development and functioning. At the behavioural level both neglect/deprivation and abuse/trauma have been shown to be risk factors for serious psychopathology even when experienced in the early years of life.

Dr Clare Cunningham

Website: http://www.whataboutthechildren.org.uk: **Tel:** 0845 602 7145
What About The Children? (***WATCh?***): Company No. 5252973 - Reg. Charity No. 1108816