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Domestic violence during pregnancy linked to structural brain changes in babies

Domestic abuse against women during pregnancy can potentially have a significant impact on how the unborn baby's brain develops, according to a new study.

Researchers from the University of Cape Town (UCT) and the University of Bath analysed brain scans of 143 South African infants whose mothers had been subject to intimate partner violence (IPV) during pregnancy. Intimate partner violence includes emotional, physical and/or sexual abuse or assault. Brain MRI scans were taken when infants were just three weeks old on average, so any changes that were observed are likely to have developed inside the womb.

Publishing their findings in the journal *Developmental Cognitive Neuroscience*, the research team report that maternal exposure to IPV during pregnancy is associated with alterations in brain structure in young infants identified shortly after birth. This was evident even when the researchers took into account maternal alcohol use and smoking throughout pregnancy as well as pregnancy complications.

Importantly, the effects of IPV exposure may differ by the baby's sex. For girls, their mother's exposure to IPV during pregnancy was linked to a smaller amygdala, an area of the brain involved in emotional and social development. For boys, IPV exposure was instead associated with a larger caudate nucleus, an area of the brain involved in multiple functions including the execution of movement, learning, memory, reward, and motivation.

Early changes to brain structures may explain why children whose mothers experience high levels of stress during pregnancy are more likely to have psychological issues in childhood or later life. Sex differences in brain development may also help explain why girls and boys often develop different mental health problems. However, the researchers cautioned that the study did not analyse emotional and cognitive development in children.

Co-author, Professor Kirsty Donald, a paediatric neurologist and head of the Division of Developmental Paediatrics at UCT, said: "Strategies that help identify and support pregnant mums for multiple potential risks to their unborn babies will require an integrated health system approach and should be considered a public health priority."

Lead researcher, Dr Lucy Hiscox from the Department of Psychology at Bath, commented: "Our findings are a call to act on the three Rs of domestic violence awareness: recognise, respond, and refer. Preventing or quickly acting to help women escape domestic violence may be an effective way of supporting healthy brain development in children."

Whilst previous studies have looked at the impact of maternal stress in pregnancy and its impacts on children's brain development, this is the first to examine domestic abuse. The children involved in this study are now aged eight to nine years old and follow-up research is testing whether the differences in brain structure seen at three weeks old persist, or are altered, as they age.

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