

# Depression-induced inflammation during pregnancy may impact newborns

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The physiological impacts of depression on pregnant mothers may affect babies while in the womb and lead to changes in the behaviour and biology of newborns, finds new King's College London research.

In a study of 106 women, babies born to [mothers](#) who were depressed during [pregnancy](#) showed altered behaviour soon after birth compared to babies of [healthy mothers](#). Babies born to mothers with [depression](#) also showed [biological changes](#) in response to stress at one year old.

The researchers found that these behavioural and biological changes are linked to depression-induced inflammation, and suggest this could be a factor in why children born to mothers with depression have a higher risk of depression as adults.

The NIHR funded scientists recruited women who were 25 weeks pregnant (49 women with Major Depressive Disorder and 57 healthy women), and studied them and their babies up to one year after birth.

They took blood from each woman at 27 weeks into their pregnancy to measure inflammation and assess whether depression put mothers' bodies under pressure akin to an infection. In addition, saliva samples were taken at 32 weeks into pregnancy, and levels of cortisol (the main stress hormone) were measured.

Blood samples from women with depression in pregnancy showed increased inflammation, and saliva samples showed increased cortisol levels when they woke up and in the evening. These women also gave birth an average of eight days earlier than the control group, at 39.2 weeks, rather than 40.4 weeks.

The researchers assessed the newborns' abilities at six days old, using the Neonatal Behavioural Assessment Scale (NBAS), to assess alertness and response to stimuli such as noise and light. At less than a week old, newborn babies born to mothers with depression in pregnancy had poorer performances than the control group.

In addition, babies had the cortisol in their saliva measured during their routine immunisations at two months and one year. Since every baby is vaccinated at the same age, the researchers used this opportunity to examine the babies' responses to the stress of immunisation.

At one year, infants whose mothers had experienced depression in pregnancy had higher cortisol response following vaccination, indicating that they were more reactive to stress.

Crucially, the study identifies a previously unknown link between depression-induced inflammation in [pregnant mothers](#) and behavioural and biological changes in their [babies](#).

Senior author Carmine M. Pariante, Professor of Biological Psychiatry, Institute of Psychiatry, Psychology & Neuroscience at King's College

London, said, 'We already knew that children born to mothers who were depressed during pregnancy are more at risk of developing depression themselves when they reach adulthood, and this paper identifies one important biological mechanism that could explain this effect.'

'Interestingly, the behavioural and biological changes in the baby are not due to mothers' postnatal depression but uniquely to the depression in pregnancy, highlighting the importance of the in utero environment.'

Professor Carmine M. Pariante leads the NIHR Maudsley Biomedical Research Centre's research into affective disorders and their interface with medicine, and he is a NIHR Senior Investigator.

First author Dr. Sarah Osborne, Senior Research Associate also funded by NIHR at the Institute of Psychiatry, Psychology & Neuroscience at King's College London, added, 'Antenatal depression is common, however, it is also easily diagnosed and treated. This study highlights the importance of pregnant mothers seeking treatment for clinical depression, as it could have long-term beneficial effects for children.'

The findings have been published today in *Psychoneuroendocrinology*. The research was funded primarily by the NIHR Maudsley Biomedical Research Centre at the South London and Maudsley NHS Foundation Trust and King's College London, with additional funding from the UK Medical Research Council, the Foundation for the Study of Infant Deaths and the Psychiatry Research Trust.

There are limitations to this research as the researchers had a small sample study, and the researchers would recommend replication in a larger sample. As expected in a longitudinal study of an inner city group of people, subject retention reduced overtime, and at 1 year postnatal only 87 mothers and their infants (51 controls and 36 cases) were assessed.

**More information:** Antenatal depression programs cortisol stress reactivity in offspring through increased maternal inflammation and

cortisol in pregnancy: the Psychiatry Research and Motherhood - Depression (PRAM-D) Study, *Psychoneuroendocrinology* (2018).

Provided by King's College London

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