Researchers investigate prenatal smoking link with antisocial behavior in children

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A Cardiff University research project has for the first time studied whether smoking during pregnancy can directly make children more likely to behave anti-socially.

The unique study by scientists at the University's Schools of Medicine and Psychology examined the records of 779 children born by in-vitro fertilisation (IVF) whose prenatal environment was provided by either a related mother or an unrelated mother. They found a link between anti-social behaviour in children whose mothers smoked in pregnancy - but only when the mother was genetically linked to the child.

When the child came from a donated egg and donated embryo - egg or embryo donation or surrogacy - there was no link, suggesting factors other than smoking during pregnancy influence anti-social behaviour.

The results of the study, funded by the Wellcome Trust, are published today (Tuesday 3 February 2009) in *Proceedings of the National Academy of Sciences.*

It is well-established that smoking during pregnancy, whether the mother is genetically related to the baby or not has an adverse effect on birth weight. However, links between what mothers do in pregnancy and how it may affect the mental health and behaviour of children are less researched. While mothers who smoke during pregnancy are more likely to have anti-social children, it has not been clear if this is a direct result of the smoking. The Cardiff University researchers were able to study

IVF children, with differing degrees of genetic relation to their parents, to disentangle the effects of genetic influences and the prenatal environment.

The study is the first study of its kind in the world to allow these effects to be separated. In the published paper, the researchers looked at effects of mother's smoking in pregnancy on the child's birth weight and the child's behaviour, paying particular attention to mothers not genetically related to their unborn baby.

Professor Anita Thapar, clinical child psychiatrist and Principal Investigator on the study said: "What we have been able to confirm is that cigarette smoke in pregnancy does lower birth weight regardless of whether the mother and child are genetically related or not, but the link with children's behaviour is different. It is now clear that offspring anti-social behaviour is more dependent on inherited factors passed from mother to child, as our group of children with mothers who smoked during pregnancy with no direct genetic link showed no increased signs of anti-social behaviour. This suggests that other influencing factors such as the mother's personality traits and other inherited characteristics are at play during the development of a baby."

Professor Thapar, who is based in the School of Medicine's Department of Psychological Medicine and Neurosciences and Mental Health Interdisciplinary Research Group worked with Dr Frances Rice (first author) and Professor Gordon Harold along with other researchers from the School of Psychology. She believes this unique approach opens the way to tease apart the effect of genes and environment on a variety of other conditions in the future and has significant policy implications. She said: "This type of research is able to tell us what sorts of interventions in pregnancy are the right ones to focus on in order to improve the physical and mental health of children."

Reference: This research is published online in the Proceedings of the National Academy of Sciences, week of February 2, 2009 under the title Disentangling prenatal and inherited influences in humans with an experimental design".

Source: Cardiff University