

Drug tests on mothers' hair links recreational drug use to birth defects

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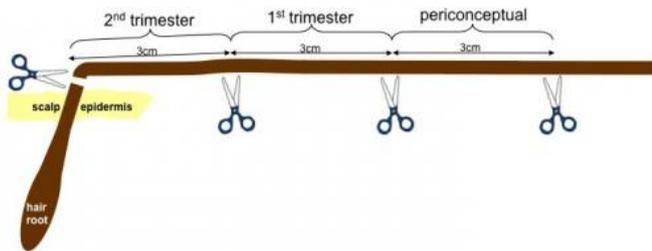


Figure 1: Hair samples comprising approximately 50 hairs were cut at the level of the hair root. From there they were divided into three 3cm segments, representing the three time periods of interest: peri-conceptual (prior to the month in which conception took place and during the month in which conception took place), 1st trimester (up to and including 12 weeks of gestation) and 2nd trimester (13 weeks of gestation onwards). In this example the hair sample was cut when the woman was at the end of the 2nd trimester, giving a 3cm length of hair for each time period of study.

drug, of whom 10 had taken more than one drug. 68 women tested positive for cannabis, 18 for cocaine, 1 for ketamine and 1 for MDMA. Drug use was highest around conception and reduced as the pregnancy progressed, but around half of the women who smoked cannabis continued to do so throughout the second trimester.

Evidence of drug use was found in a significantly higher proportion of women whose babies were born with brain birth defects (35%), compared to women whose babies were normally formed (13%). Brain birth defects included brain anomalies other than spina bifida, such as brain cysts and under-development of the brain. These can have severe consequences and lead to lifelong conditions such as cerebral palsy.

A description used in the hair sampling method used by UCL researchers to detect drugs in the hair of women who had recently given birth. Credit: Anna David, UCL

Drug tests on 517 mothers in English inner city hospitals found that nearly 15% had taken recreational drugs during pregnancy and that mothers of babies with birth defects of the brain were significantly more likely to have taken drugs than mothers with normal babies. The study found no significant links between recreational drug use and any other type of birth defect.

The study was led by a team of UCL researchers co-ordinating data collection from hospitals across London, Bristol and Birmingham and the results are published in the journal *PLOS ONE*. The study included 213 women whose baby had a type of birth defect with potential links to recreational drug use, 143 women whose baby had a [birth defect](#) with no previously reported links to drug use and 161 women whose baby was normally formed.

77 (14.9%) of the women who agreed to take part tested positive for at least one type of recreational

"Our findings suggest a link between brain birth defects and recreational drug use in expectant mothers," Dr Anna David of the UCL Institute for Women's Health, lead author of the study and Consultant in Fetal Medicine at UCLH. "We were unable to identify significant links between specific drugs and brain birth defects. Therefore I would discourage [women](#) trying to get pregnant and those in early pregnancy from taking any recreational drugs including cannabis. Since only 20 of the mothers in our study had babies with brain birth defects, a larger study of such cases is now needed to examine the links with specific drug use more closely."

The study set out to investigate the link between drug use around the time of conception and the first trimester and a variety of birth defects. Smaller studies had suggested that drug use might be a primary risk factor for gastroschisis, a defect in the baby's belly that must be surgically repaired at birth. Other known risk factors for this abnormality include young maternal age and smoking. This larger study showed that the young age of the mother rather than recreational drug use was identified as the primary risk factor for

gastroschisis. But for brain defects, drug use was a primary risk factor after taking into consideration the mother's age and use of tobacco and alcohol. Larger studies are now needed to investigate the link between the types of drug use and brain birth defects.

"Current evidence linking recreational drug use with birth defects is patchy as it relies on self-reporting which can be unreliable," explains Dr David. "Our anonymised hair testing offers an objective measure of recreational drug use and showed that it is common in pregnancy. The risks of alcohol and tobacco in pregnancy are relatively well-researched, and we hope that research into drug use will catch up now that we have demonstrated its relevance to babies' health and development."

Researchers took hair samples from consenting [mothers](#), which were then tested for evidence of recreational drug use. The laboratory performing the [drug tests](#) were not given access to patient clinical data and all results were anonymised.

When someone takes drugs, traces from the bloodstream are deposited in their hair as it grows. Hair grows at an average rate of one centimetre per month, so a 9cm sample of hair from the scalp will give an approximate timeline of drug use from the past 9 months. The researchers divided hair samples into three sections of 3cm each, in order to time drug use to the months before and during conception, the first trimester and the second trimester.

Provided by University College London

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