

New Study Finds Strong Evidence that Cannabis Use Disrupt Women's Fertility

Researchers investigated how tetrahydrocannabinol (THC), the main psychoactive compound found in cannabis, affects [women's fertility](#). Their findings showed links between THC exposure and outcomes relevant to reproductive health, including a positive association with oocyte nuclear maturation alongside lower embryo euploid rates, chromosome segregation errors, and atypical spindle morphology.



Study

Researchers investigated the impact of THC on oocyte health, gene expression, and chromosome segregation, combining laboratory experiments with [clinical data](#).

They used donated biological materials, including follicular fluid (FF) and immature oocytes, from IVF patients who had provided informed consent. Patients with poor fertility outcomes, advanced age, or THC exposure were excluded to ensure sample quality. THC and its metabolites were measured in FF and [serum](#).

For laboratory experiments, immature oocytes were divided into three groups: Control, low-dose THC (reflecting [physiological levels](#)), and high-dose THC (based on animal studies). Oocytes were cultured for 24 hours, with maturation and key cellular events monitored using time-lapse imaging.

Some oocytes underwent ribonucleic acid (RNA) sequencing to identify transcript changes, while others were immunostained to examine spindle structure. Polar body biopsies were also performed for chromosome analysis using [whole-genome sequencing](#).

Data were analyzed with established [bioinformatics](#) pipelines and statistical tests, and clinical IVF outcomes were compared using a retrospective matched case-control design. All procedures followed ethical approval and Canadian cannabis regulations.

Results

The researchers measured THC and its metabolites in FF from [IVF patients](#) and found that 6% of samples were positive. Most contained the metabolite 11-COOH-THC, while Δ9-THC and 11-OH-THC were often detected together.

Interestingly, 73% of THC-positive patients had not disclosed cannabis use. Concentrations of these metabolites were similar between FF and serum. Statistical analysis revealed that THC metabolite levels were positively correlated with [oocyte maturation](#) rates but not with fertilization or blastocyst development.

In laboratory experiments, immature oocytes were cultured with physiologically relevant or higher concentrations of THC. While there was a non-significant trend toward higher maturation, THC exposure did not alter oocyte size, timing of key maturation events, or [polar body extrusion](#).

However, transcriptome sequencing revealed substantial changes in gene expression. Low-dose THC exposure altered 316 genes (predominantly downregulated), while high-dose exposure affected 464 genes (predominantly upregulated), involving pathways related to [inflammation](#), extracellular matrix remodeling, immune signaling, and chromosome segregation. Examples included downregulation of MMP9, a gene involved in extracellular matrix remodeling.

Further analyses revealed that THC exposure increased chromosome segregation errors, with more [abnormal spindle structures](#) (92% of high-dose oocytes vs 42% of controls) and an increase in complex aneuploidy (42% of THC-exposed oocytes vs 0% in controls).

Clinically, THC-positive patients had significantly lower embryo euploidy rates and reduced odds of achieving favorable blastulation and euploidy outcomes during IVF. In simple comparisons, there was no significant difference in fertilization or blastocyst rates between THC-positive and matched [THC-negative cycles](#). However, adjusted models indicated lower odds of achieving the prespecified blastulation and euploidy thresholds in the THC-positive group.

Conclusion

This study shows that THC, the main psychoactive compound in [cannabis](#), affects human oocytes by altering maturation, transcript profiles, chromosome segregation, and spindle organization.

While THC appeared to accelerate oocyte maturation, it also disrupted critical molecular pathways, reduced embryo euploidy rates, and increased [chromosomal errors](#), which may lower fertility outcomes. These findings align with some previous animal studies but provide direct evidence in human oocytes, highlighting potential risks for people undergoing IVF.

A major strength of this research is its integrated approach, which combines retrospective clinical data with detailed in vitro experiments and measures THC [metabolites](#) directly, rather than relying on self-reports.

However, limitations include the use of immature oocytes from stimulated cycles, a lack of power to examine effects by age, and missing data on [cannabis consumption](#) habits or co-exposures.

Future studies should explore dose–response effects, mechanisms of THC action in oocytes, and long-term impacts on [embryo development](#). Clinically, these findings emphasize the importance of counseling patients about potential fertility risks linked to cannabis use.

Source:

<https://www.news-medical.net/news/20250910/Can-cannabis-use-disrupt-womene28099s-fertility-New-study-finds-strong-evidence.aspx>