

Over-the-counter fungicide can disrupt fetal and maternal hormones

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Europharm Lab Clotrimazole Cream Antimycotic Drug. Credit: Watswang CC3.0

The active ingredient in medicines commonly used to treat yeast

infections has the potential to disrupt steroid hormone levels, according to a study from the National Food Institute, Technical University of Denmark. This can have consequences for sexual development in unborn babies if women use these medicines during pregnancy.

Steroid (sex) hormones play a central role in sexual [development](#): They help determine how boys become boys and girls become girls. If these hormones are disrupted during fetal life, it can lead to a string of reproductive disorders at birth and later in life, including malformed genitals and decreased fertility.

Many [environmental chemicals](#) are known to disrupt the [hormone](#) system and are often referred to as endocrine disrupting chemicals. Azole fungicides constitute one group that can act as [endocrine disruptors](#). Azoles are used to combat yeast infestations in seed and [food crops](#), but are also used in medications for humans.

Most azoles used in medicines are tightly regulated and their use is well controlled. However, some are sold over-the-counter, for instance clotrimazole, which is used to treat various fungal infections, including vaginal thrush.

Significantly altered sex hormones

In a recent study, researchers from the National Food Institute have shown that clotrimazole can significantly alter sex hormones in pregnant rats and their developing fetuses.

These effects were observed at the same exposure concentrations as those observed in pregnant women, who use clotrimazole to treat thrush. The study also found that the chemical is rapidly eliminated from the rat body, just as in humans. Nevertheless, clotrimazole affects the endocrine system during a sensitive time of development, causing concern that

human exposure can give rise to similar effects.

Another study in humans had already raised concern about the potential for clotrimazole to disrupt male sexual development. This new study confirms that clotrimazole can disrupt hormones in the rat fetuses, which can have consequences for sexual development.

The researchers are concerned that indiscriminate use of the medication during pregnancy could potentially have negative effects on [sexual development](#) of the fetus—particularly if the mother-to-be is also exposed to other endocrine disrupting chemicals at the same time, such as paracetamol and other substances such as phthalates and bisphenols from plastics.

Need for more research

It is not necessarily exposure to clotrimazole alone that is a problem, but rather the combined exposure to endocrine disruptors that women may be exposed to during pregnancy. Further research could help to determine this, which is why the National Food Institute's researchers are calling for more knowledge about this issue.

The study is described in further detail in an article in the journal *Toxicology and Applied Pharmacology*: Human-relevant concentrations of the antifungal drug clotrimazole disrupt maternal and fetal steroid hormone profiles in rats. The study was carried out under the Danish Centre on Endocrine Disrupters (CeHoS).

More information: Monica Kam Draskau et al, Human-relevant concentrations of the antifungal drug clotrimazole disrupt maternal and fetal steroid hormone profiles in rats, *Toxicology and Applied Pharmacology* (2021). [DOI: 10.1016/j.taap.2021.115554](https://doi.org/10.1016/j.taap.2021.115554)

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