New hope given to women struggling to conceive
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Southampton researchers have found new insight into why some women have difficulty falling pregnant.

Endometriosis is a chronic condition affecting around 10 per cent of women and is associated with chronic abdominal pain, irregular periods, and lowered fertility.

In order to become pregnant a woman must produce a mature egg. Maturation occurs in fluid-filled structures called follicles in the ovary. The mature eggs are then released to become fertilised however eggs in women who have endometriosis are affected by a very hostile uterine environment that lowers fertility. It is assumed that the egg itself, before it is released, is not affected by the endometriosis.

However, in a collaborative study between researchers at the University of Southampton and Princess Anne Hospital's Complete Fertility Centre, it was found that egg quality is severely compromised in endometriosis.

Published in Scientific Reports, the study found that the ability of the egg to mature was blocked by endometriosis, and furthermore that eggs could suffer serious damage by exposure to follicular fluid from women with endometriosis.

Dr Simon Lane, Research Fellow at the University of Southampton who led the study said: "We believe these results could have clinical implications for many women struggling to fall pregnant. We found that fluid from the follicles of patients with endometriosis was found to block egg maturation by generating free-radical chemicals called Reactive Oxygen Species (ROS) in the egg, which damaged their DNA. This damage caused the egg not to mature, and hence it could not be fertilized. More research is now needed to investigate whether the damage caused by endometriosis is treatable or preventable."

The study involved taking immature mouse eggs and incubating them in follicular fluid taken from women who have endometriosis, in vitro. The researchers examined the amounts of ROS that were generated and the ability of the egg to mature. They found the follicular fluid from women with endometriosis resulted in higher amounts of ROS.

The research team believes that the effects of endometriosis on maturing eggs could be prevented by antioxidants. During the study the team analysed the effects of two antioxidants. Resveratrol, which is found in the skins of grapes and berries and Melatonin, a compound released during sleep, were added to the fluid and were shown to reverse the negative effects; ROS levels decreased and more eggs were able to mature.

Ying Cheong, Clinical Director of the Complete Fertility Clinic and Professor of Reproductive Medicine at the University of Southampton, added: "Endometriosis is strongly associated with infertility and up to 50 per cent of women who require infertility treatment have it. Struggling to have a baby can be terribly upsetting for a couple, so this new research gives some hope to people. It is very encouraging to see the possibility of the damage
being prevented by antioxidants but more work is needed before we can put our results into practice."

**More information:** Mukhri Hamdan et al, The sensitivity of the DNA damage checkpoint prevents oocyte maturation in endometriosis, *Scientific Reports* (2016). [DOI: 10.1038/srep36994](https://doi.org/10.1038/srep36994)

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