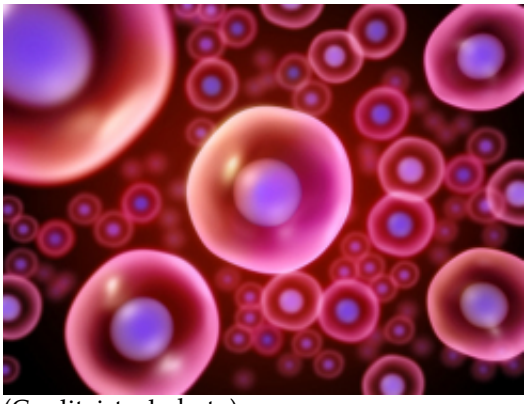
Stem cells in ovaries may grow new eggs, study shows


(Credit: istockphoto)

(CBS/AP) Stem cells in young women's ovaries are capable of producing new eggs, according to a new study. The findings challenge 60 years of dogma that women are born with all the eggs they'll ever have.

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For the study, published in the Feb. 26 issue of Nature Medicine and led by Jonathan Tilly of Massachusetts General Hospital, researchers examined healthy human ovaries donated by 20-something Japanese women who were undergoing a sex-change operation. The researchers fished out stem cells by searching for a protein found only on the surface of stem cells. The researchers then injected those stem cells into pieces of human ovary, transplanting the tissue under the skin of mice, to provide the tissue with a nourishing blood supply.

What happened? New egg cells formed within two weeks.

That's still a long way from showing they'll mature into usable, quality eggs, David Albertini, director of the University of Kansas' Center for Reproductive Sciences, cautioned.

Still, these findings could lead to better treatments for women left infertile because of disease - or simply because they're getting older.

"Our current views of ovarian aging are incomplete. There's much more to the story than simply the trickling away of a fixed pool of eggs," Tilly, who has long hunted these cells in a series of controversial studies, said.

Tilly's previous work has drawn skepticism, and independent experts urged caution about the latest findings, so the next step is to see whether other laboratories can verify the work. If the findings are confirmed, then it would take years of additional research to learn how to use the cells, Teresa Woodruff, fertility preservation chief at Northwestern University's Feinberg School of Medicine, said.

"This is experimental," Dr. Avner Hershlag, chief of the Center for Human Reproduction

at North Shore-LIJ Health System in Manhasset, N.Y., told HealthDay. He said the study is "exciting" but emphasized the work is still very preliminary. "This is a beginning of perhaps something that could bring in new opportunities, but it's going to be a long time in my estimation until clinically we'll be able to actually have human eggs created from stem cells that make babies."

Still, even a leading critic said such research may help dispel some of the enduring mystery surrounding how human eggs are born and mature.

"This is going to spark renewed interest, and more than anything else it's giving us some new directions to work in," Albertini said. While he has plenty of questions about the latest work, "I'm less skeptical," he said.

Scientists have long taught that all female mammals are born with a finite supply of egg cells, called ooctyes, that runs out in middle age. Tilly, Mass General's reproductive biology director, first challenged that notion in 2004, reporting that the ovaries of adult mice harbor some egg-producing stem cells. Recently, Tilly noted, a lab in China and another in the U.S. also have reported finding those rare cells in mice.

More work is needed to tell exactly what these cells are, cautioned reproductive biologist Kyle Orwig of the University of Pittsburgh Medical Center, who has watched Tilly's work with great interest.

But if they're really competent stem cells, Orwig asked, then why would women undergo menopause? Indeed, something so rare wouldn't contribute much to a woman's natural reproductive capacity, added Northwestern's Woodruff.

Tilly argues that using stem cells to grow eggs in lab dishes might one day help preserve cancer patients' fertility. Today, Woodruff's lab and others freeze pieces of girls' ovaries before they undergo fertility-destroying chemotherapy or radiation. They're studying how to coax the immature eggs inside to mature so they could be used for in vitro fertilization years later when the girls are grown. If that eventually works, Tilly says stem cells might offer a better egg supply.