In vitro fertilization: The pluses add up

Would-be parents with fertility problems, take heart: A new study finds that older women who receive donated eggs have the same chances of becoming pregnant and bearing healthy babies as younger women who undergo the same procedure. Moreover, a second study indicates that children conceived by in vitro fertilization (IVF) grow and develop just as well — and as quickly — as infants conceived through natural means.

In the first study, a group led by reproductive endocrinologist Mark V. Sauer of the University of Southern California in Los Angeles followed the reproductive success of 65 women between the ages of 40 and 52 who received implants of eggs donated by younger women and fertilized by the sperm of the recipients' husbands. The researchers compared the pregnancy and birth rates of these women with those of two other groups of prospective mothers: one consisting of 35 women under age 40 who had also received donated eggs, the other consisting of 57 women over age 40 who underwent IVF using their own eggs.

Sauer's group found that the older women who received donated eggs were three times as likely to become pregnant — and nearly four times as likely to deliver a baby — as the older women who underwent IVF using their own eggs. Moreover, the older recipients had roughly the same proportion of pregnancies and deliveries as their younger counterparts, the researchers report in the Sept. 9 JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION.

Sauer's group concludes that the findings strengthen their hypothesis that infertility among older women results not from aging wombs, but from aging eggs. Sauer and his colleagues first reported this concept two years ago, based on a similar study of seven menopausal women, four of whom had babies after receiving donated eggs (SN: 10/27/90, p.263).

The latest finding "is a truly exciting development in the clinical practice of reproductive medicine," physician Martin M. Quigley of the Northeast Regional Center for Infertility and IVF in Beachwood, Ohio, writes in an editorial accompanying the new report. However, he cautions that as more women postpone marriage and childbearing, "consumer demand may outstrip our ability to provide the necessary [egg] donors." He adds that because the risks of maternity increase with age, "it is vital that women considered as recipients continue to undergo thorough testing, screening, and evaluation" to ensure their safety.

In the second new study, a group led by obstetrician Joseph M. Brandes of the Rambam Medical Center in Haifa, Israel, compared the growth and development of 116 children conceived by IVF with those of a control group of 116 naturally conceived children of similar age, birth weight, sex, and mode of delivery. Both groups of children ranged in age from 1 to 4 years, and each included 19 pairs of twins and four sets of triplets.

The researchers report in the September PEDIATRICS that IVF babies born singly thrived just as well as their naturally conceived counterparts, while twins and triplets from both groups experienced roughly the same growth impairments. The Israeli group also found that singleton IVF and non-IVF babies earned similar scores on two separate tests of mental development and motor skills. Brandes and his colleagues conclude that "when an IVF pregnancy is carried to term, yielding an apparently healthy infant, the infant can be expected to develop and thrive similarly to his non-IVF-conceived peer."

Suheil Muasher of the Jones Institute for Reproductive Medicine at Eastern Virginia Medical School in Norfolk says the study "gives reassuring information" for prospective parents undergoing IVF. Muasher, who directs the Jones Institute's IVF program, adds that several of his colleagues reported in 1989 that children conceived through IVF showed no higher rates of congenital abnormalities or developmental delays than children conceived naturally. — *C. Ezzell*

Brain images show structure of depression

A preliminary investigation has identified specific parts of the brain involved in severe, or major, depression. Two areas stand out: The left prefrontal cortex malfunctions only during bouts of depression, whereas the amygdala — a small, inner-brain structure thought to regulate emotional reactions — operates abnormally both during and between depressive episodes, apparently serving as a biological marker of susceptibility to severe depression.

Psychiatrist Wayne C. Drevets of Washington University School of Medicine in St. Louis and his colleagues pinned down these regions by tracking blood flow in the brain. They present their data in the September JOURNAL OF NEUROSCIENCE.

Scientists track cerebral blood flow by injecting volunteers with a minute amount of a radioactively labeled oxygen compound. A positron emission tomography (PET) scanner picks up gamma rays emitted by the rapidly decaying compound and produces images of blood flow throughout the brain.

The bleak mood, apathy, hopelessness, and other signs of severe depression typically wax and wane. Drevets and his associates performed PET scans on 13 adults who suffered from severe depression at the time of testing and 10 others previously diagnosed with depression but showing no signs of the disorder when the study took place. All participants were right-handed and had at least one parent, sibling, or child with major depression but no family history of other psychiatric disorders.

Depressed volunteers had not taken any psychoactive medication for at least three weeks.

Another 33 right-handed people, with no history of depression, served as controls.

In the first phase of the study, the researchers examined six currently depressed volunteers and 18 controls. PET images focused on the entire brain rather than any particular areas. A computer compared the images with the help of a program designed to minimize individual differences in anatomy and produce a composite view of blood flow for the entire group.

With the composite serving as a baseline measure, markedly increased blood flow, indicating increased brain-cell activity, appeared in the left prefrontal cortex of all the depressed individuals but none of the controls.

Drevets' group focused on that area of the brain in the remaining seven currently depressed volunteers and 15 controls. Again, the left prefrontal cortex displayed heightened blood flow only among the depressed. PET data also revealed increased blood flow in the amygdala of depressed individuals.

The investigators then compared PET images of volunteers whose depression was in remission to those of currently depressed individuals and controls. Both groups diagnosed with depression showed comparable blood-flow boosts in the amygdala, but the prefrontal cortex remained stable among those in remission.

"Excessive blood flow in the prefrontal cortex indicates that a depressive episode is in progress," Drevets contends. Elevated blood flow in the amygdala seems to signal that an individual harbors a biological propensity to severe depression, at least when such depression runs in that person's family, he adds.

The prefrontal cortex may process the constant negative thoughts that often characterize depression, Drevets theorizes. The amygdala probably plays a role in the severity of depression, he notes; those participants with the most debilitating symptoms displayed the most striking blood-flow jumps in the amygdala.

A set of chemical messengers that normally dampen the activity of the prefrontal cortex, the amygdala, and another brain structure that links the two regions may go awry in some cases of severe depression, Drevets suggests. — *B. Bower*