

HIGHLIGHTS:

Infertility affects more than 6.1 million women in the United States according to the American Society of Reproductive Medicine. Most infertility cases — 85 to 90 percent are treated with conventional medical therapies such as medication or surgery. Others are treated with special procedures, known as assisted reproductive technologies or ART, that involve handling both the woman's eggs and the man's sperm outside of one's body. Two studies recently completed at Cedars-Sinai Medical Center focused on the risks of chromosomal abnormalities in pregnancies conceived by infertile couples who underwent ART. The studies were presented this month at the Conjoint Annual Meeting of the American Society for Reproductive Medicine and the Canadian Fertility and Andrology Society in Montreal, Quebec, Canada.

STUDIES EXPLORE THE RISK OF CHROMOSOMAL ABNORMALITIES IN PREGNANCIES CONCEIVED WITH ASSISTED REPRODUCTIVE TECHNOLOGIES

LOS ANGELES (Oct. 27, 2005) – Couples who are considering assisted reproductive technology (ART) as their treatment for infertility may be especially interested in the results of two studies on the risks of genetic abnormalities recently completed at Cedars-Sinai Medical Center. Both studies looked at the risks of chromosomal disorders in pregnancies conceived by women over the age of 35 through ART — one study focused on single pregnancies and the other on twins. Single pregnancies conceived with ART were found not to have a higher risk of chromosomal abnormalities when compared to those conceived spontaneously. In the second study, twin gestations conceived through in vitro fertilization (the most common type of ART) appear to have a higher rate of abnormalities, when evaluated at the time for chorionic villus sampling (CVS), than twins conceived spontaneously. The studies were presented this month at the Conjoint Annual Meeting of the American Society for Reproductive Medicine and the Canadian Fertility and Andrology Society in Montreal, Quebec, Canada.

Margareta D. Pisarska, MD, co-director of the Center for Reproductive Medicine at Cedars-Sinai, is part of a team of investigators who conducted the two studies.

“Prior to our study of singleton pregnancies conceived with ART, there was evidence in the literature showing many of the miscarriages were attributed to genetic abnormalities,” says Pisarska. “We wanted to investigate whether these abnormalities were the result of the ART procedure itself or were inherent to the infertility condition which was overcome by ART.”

Medication, insemination, and surgery have been considered to be the conventional fertility therapy. ART procedures, including in vitro fertilization (IVF), gamete intrafallopian transfer (GIFT) and zygote intrafallopian transfer (ZIFT) which combines IVF and GIFT, though well-known and popular treatment modalities, are still considered advanced and high-tech.

In the first study, 1098 patients were studied who were over the age of 35 and underwent a procedure called chorionic villus sampling (CVS). CVS is a test in which a tiny sample of the placental tissues is taken for a pre-natal diagnosis of potential genetic defects, and is usually performed between 9 to 12 weeks gestation. In the first part of this study, the investigators segregated the patients into two groups by the way they achieved pregnancy, either through fertility treatments or conceiving spontaneously. In the second part of the study, the pregnancies conceived after fertility treatment were further analyzed by the type of fertility treatment,

either with ART or medication with insemination.

“We knew that the high rate of early embryonic pregnancy loss that occurred early in the first trimester of pregnancy was probably the result of genetic abnormalities in both the spontaneous pregnancies and in those pregnancies achieved with ART ... probably as high as 70 percent of early losses are caused by chromosomal abnormalities. In this study we were particularly interested in what happened later in the first trimester, at 9 to 12 weeks. We did not find any higher incidence of cytogenetic abnormalities at this stage, between pregnancies achieved in infertile couples after treatment compared to those of spontaneous pregnancies. Nor did we find any higher rate of abnormalities in couples treated with ART compared to those treated with fertility drugs and insemination. This was very reassuring to us as fertility physicians.”

Pisarska says that further investigation is still needed in the long run, however, to determine if the small number of genetic disorders that occurred at 9-12 weeks gestation were the result of the infertility alone or were transferred from one of the parents to their offspring.

In the second study involving only twin pregnancies, the findings demonstrated that twin gestations conceived through ART appear to have a higher rate of cytogenetic abnormalities compared to spontaneously conceived twins.

“Previous studies suggested that there was an increased incidence of chromosomal disorders in twins. There was also controversy whether there was an increased risk of genetic abnormalities in pregnancies conceived through IVF. We wanted to determine if both factors were independent risk factors and if there was an increased risk of chromosomal abnormalities among twin gestations conceived through IVF,” Pisarska explains.

Twin pregnancies commonly result from IVF and other fertility treatments. “Many people do not realize that women who have dizygotic twins (two separate eggs and two separate sperm) have a higher rate of chromosomal abnormalities – estimated between two to five fold higher – than women with single pregnancies.”

A woman who is 38 (the average age of the study participants) who has a singleton pregnancy conceived spontaneously has a 1 in 60 chance of having a child with a chromosomal disorder. If she has a twin pregnancy, that rate jumps to 1 in 34, according to Pisarska.

As in the study of single pregnancies, the women in the twin study were 35 years of age or older and had chorionic villus sampling done between 9 and 12 weeks.

“We wanted to see if IVF treatment adds to the rate of chromosomal abnormalities in twins, and we found that it did. However, age was an important factor. Even though the age difference in the women who conceived with the help of IVF compared to those who conceived spontaneously was not very large – 39 versus 37 – it was significant enough to say that age may be a contributing factor. We need to look at this further.”

Pisarska emphasizes that genetic screening is very important, especially for women over 35. “We strongly encourage women over the age of 35 who come to us for fertility treatment to undergo perinatal diagnostic testing such as chorionic villus sampling or amniocentesis. “Early cytogenetic testing gives couples the opportunity to consider their options early if a pregnancy is genetically abnormal.” More than 1,600 CVS procedures are performed at Cedars-Sinai’s Perinatal Diagnostic Center each year.

In addition to Pisarska, the other physicians on the research team for these two studies were S. S. Patel, MD, Lee-Chuan Kao, MD, Ph.D., John Williams, MD, and R. Jalian.

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