

Israeli Medical Achievements

Israeli specialists first to freeze eggs of five-year-old cancer patients for future harvesting

An Israeli medical team has succeeded for the first time in the world to remove eggs from pre-pubescent cancer patients – some as young as five – and bring them to maturity before freezing them, giving the girls a better chance to one day have children.

According to Dr. Ariel Revel, head of the in vitro department at Hadassah University Hospital, Jerusalem, until now scientists had thought viable eggs could only be obtained from girls who had undergone puberty.

“When you obtain eggs at this age – or any age in which the eggs have not been stimulated by hormones – they’re immature and unable to be fertilized,” he told sources from Lyon, France where he was presenting a paper on his research to the annual meeting of the European Society of Human Reproduction and Embryology.

But the technique which Revel and his colleagues at Hadassah developed enables them to mature the eggs in vitro.

“We isolate eggs from the tissue and, following one or two days in culture, they are mature enough for freezing,” he explained.

The pressing need for a breakthrough like this is clear. Childhood cancer has cure rates of between 70 to 90 percent but, according to Revel, the aggressive chemotherapy which is often required to treat the patient can leave children sterile.

“The whole process started with requests from patients – or more specifically, parents of patients. They were informed by the Hadassah physicians handling their case that the cancer their daughter was diagnosed with was quite aggressive, and they learned about the long term side effects related to fertility – basically that therapy would kill most or all of the eggs in the ovary

and the likelihood of having children was slim,” said Revel.

Revel was already a leading figure in the field of freezing reproductive techniques. In 2004, Revel’s team succeeded in producing babies for a couple from Jerusalem who had the embryos frozen 12 years earlier. The embryos are considered to be the world’s oldest to have been implanted successfully in a womb and proves frozen embryos can remain viable for much longer than previously believed. Until Revel’s breakthrough, the longest human eggs have been frozen and then defrosted to produce an in vitro fertilization (IVF) baby was seven years.

Having achieved such remarkable success, Revel was called in for consultation on the delicate issue of the girls’ eggs.

“I felt like I was in a difficult position though, and didn’t want to take a decision alone,” he said. “So we arranged for a multi-disciplinary team to address the issues involved – including physicians, pediatric surgeons as well representatives from the ethics department of Hebrew University. The idea was to set some sort of guidelines on what kind of approach to take on the issue.”

The committee decided that it would propose freezing the eggs of the girls only in severe cases where the child suffered an aggressive attack of cancer and required an equally aggressive treatment.

Beginning in 2003, Revel and his colleagues performed surgery on 18 patients aged 5 to 20. Of 167 eggs, 41 were successfully matured, including some from pre-pubescent donors, which were then indistinguishable from those of older women.

“My paper on the subject has received lots of attention from colleagues

and the media, I think, because of the fact we were able to save and freeze the eggs of such young girls was rather surprising. Since these girls are not menstruating, we would expect maturing them to be very difficult, but we have shown that they do mature,” said Revel.

Revel, who studied and did his residency at Hadassah, has been the head of its In Vitro Unit since 2000. He sees the whole process of freezing the young patients’ eggs as a hope-building endeavor for the families involved, even if there are not happy endings.

“One 12-year old girl was diagnosed with femur cancer. She and her parents agreed to the procedure and we froze an ovary and a few eggs.

“Many months later, there were complications in her cancer treatment, and she didn’t make it. But in my last meeting with her, she was quite optimistic, and asked me to help her have a baby one day,” Revel recounted.

“With these patients and their parents, we discuss the issues of fertility, even though it’s sometimes a decade or more away until they’ll be old enough to become parents. Discussing issues of the future like that gives them hope that they may survive the disease, and takes their mind off the cancer treatment and the complications,” he added.

While no eggs have yet been thawed and there’s no way of knowing whether pregnancies will result, Revel is encouraged.

“Now we have some eggs, at the position of being ready for fertilization. It’s an optimistic story, but time will tell how efficient the process is and whether the eggs will be useful for fertilization.” ■

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