

# Life in a bottle

Vitrification, a process of fast-freezing the embryo, is replacing traditional IVF procedures in Mumbai now. Experts also report a higher success rate, finds Labonita Ghosh

Vitrification is a procedure by which some material can be converted into an amorphous, glass-like form with the quick removal (or addition) of heat. It is a commonly-used process in the glass industry to make windows and tableware. In the recent business to make rock candy and candyfloss, and recently scientists found that it is an eco-friendly way to store or dispose of nuclear and hazardous waste. Now Mumbai's doctors have discovered that it's also good for making babies.

In-vitro fertilisation (IVF) experts in the city are fast switching over to vitrification not only because it is quick and efficient, but also — and complex trying to have children through IVF will be happy to know — some clinics have reported an increased pregnancy rate with vitrification. "It's a new procedure in India, but it has proven to be quite effective," says Dr Indira Hinduja, a pioneer of IVF in the city, adding that "more doctors are opting for it now." Dr Ishikish Patel of Lilavati Hospital says vitrification improved the efficiency of his entire system. "It sounds unbelievable, but I have seen the pregnancy rate at my clinic go up from 30-40 per cent earlier to an unbelievable 75 per cent," he says. "I no longer follow the older IVF procedures anymore."

#### QUICK-FREEZING THE EGG

It's a vital part of IVF wherein couples, who cannot conceive naturally, opt for assisted reproduction by having the woman's eggs or oocytes taken out and fertilised with the man's sperm to create an embryo that will be transplanted in the ovary. The usual method of preserving the egg — either before fertilisation as an oocyte, or after as an

embryo — is to slow-freeze it. That is, to keep it in conditions where the temperature is dropped by about 0.5°C every minute till the embryo freezes and can be cryo-preserved, or stored in liquid nitrogen at —196°C. Freezing is necessary to preserve oocytes for fertilisation later. In fact, the more oocytes extracted and preserved, the more fertilisation cycles can be conducted.

Vitrification, or super-rapid-freezing, however, involves suspending the embryo to a quick drop in temperature — from room temperature to —400°C in seconds — before being preserved. While slow freezing can lead to crystals forming inside the embryo that can damage it, vitrification bypasses this step altogether, making conditions safer for the embryo.

The real advantage comes into play when the embryos are thawed or "recovered" for use. In slow freeze, only about 40 to 50 per cent of the embryos make it. With vitrification, sometimes all the embryos can be recovered. "We hardly lose any embryos in the recovery with vitrification," says Dr Patel. "I have had an incredible recovery rate of almost 90 per cent at times." And, as embryologist Dr Vijay Khargolik, puts it, "It's about their viability as well. Vitrification makes

most of them retain their ability to grow further and eventually lead to a pregnancy."

#### BRINGING JOY, THE WORLD OVER

In layman's terms, this means with more eggs recovered, the chances of pregnancy increases. Doctors can try several cycles of fertilisation given that there are more embryos to work with, says Dr Nandini Palshetkar, obstetrician gynaecologist and IVF specialist. Fertility guidelines worldwide also allow only up to three embryos to be put back in the ovaries and now the ICMR has enforced this rule in India. So although couples may want more embryos to be put back, for an assured pregnancy, this inevitably opens up the mother to the dangers of multiple and premature births, sickly babies and possibly a long and expensive stay in the ICU. "With vitrification, we are moving towards having more healthy embryos of which only one may need to be transplanted in future," says Dr Palshetkar.

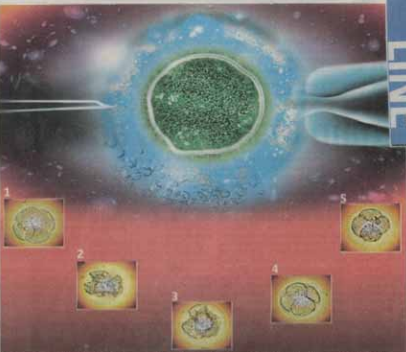
#### SURE SHOT, OR IS IT?

In Mumbai, patients are only now beginning to see the merits of vitrification. Seema Purkar's first few cycles of IVF in 2006 were a disaster. On one occasion, the 25-year-old teacher hyperstimulated her

ovaries produced more eggs than her body could handle — and she began to have other organ complications. Her kidney failed and water retention in her lungs.

When doctors told her about vitrification in early 2007, she decided to switch, mid-treatment, to the new method. "I had tried six different IVF techniques, without success," says Purkar. "When we heard about vitrification, I was a little concerned about being one of the early patients on whom this was being tried, since anything could go wrong." There was also the matter of expenses. The conventional IVF procedure at the clinic Purkar went to, costs Rs12 lakh with drugs. Vitrification would set her back by another 40,000. "At some clinics, the cost of vitrification is almost one-and-a-half times more," says Dr Hinduja. But eager couples are usually keen to try anything. The Purkars' gamble paid off; Seema is now pregnant.

Still, a new procedure needs new and extensive study, cautions Dr Shreyas Padgaonkar, honorary secretary general of the Indian Society of Assisted Reproduction (ISAR). "Although I have not come across any reports to suggest that vitrification has disastrous results, it is still so new that we have to study the children conceived using vitrification and see if their physical and mental development is normal," he says. "It's still too soon to tell." For one thing, baby Kiran, who might just be the city's first vitrification baby, is only 30 months old. Proud mother Radhika Kapoor says so far, her daughter's development is progressing on schedule. "If anything, I sometimes find her to be much smarter than other kids her age." [ghosh@sunday.com](mailto:ghosh@sunday.com)



Contrary to traditional IVF techniques where the embryo is slow-frozen, vitrification involves super-freezing the embryos from room temperature to —400°C in seconds (1&2). When thawed, almost all embryos can be recovered successfully (3,4 & 5), unlike in the traditional procedures, where only 40-50 per cent make it. The recovered embryo is then transplanted to the ovary (top) — *Radhika Ghosh*



Dr Ishikish Patel and Dr Nandini Palshetkar with the vitrification apparatus at Lilavati Hospital