

Sex-selection by IVF: detrimental to Indian women

Firuz Parikh opposes the use of pre-implantational genetic diagnosis for sex selection

In almost all human populations there is a slight excess of males at the time of birth: 106 boys to 100 girls. In India, this ratio is skewed even further and out of proportion, of course in favour of the male child. In nature, this is because Y-containing sperm survive better within the female reproductive tract. In India this is due to female infanticide, female foeticide and now female embryocide.

The technology of pre-implantational genetic diagnosis (PGD) may now be used for the sole purpose of sexing the pre-embryo for the selective destruction of the female pre-embryo. The only restraint that society may exercise is financial, because not all couples will have the finances to undergo in-vitro fertilisation, then discard precious pre-embryos.

There are many reasons why sex determination by PGD should not be encouraged, on ethical, medical and technical grounds. First, the medical issues. The ability to screen the DNA content of pre-embryos has resulted from the evolution of the assisted reproduction techniques and the development of sensitive genetic tools to probe the nucleus for a single gene. The entire set-up requires the presence of an assisted reproduction unit with acceptable pregnancy rates, a genetic diagnostic team, a geneticist and a counselor -- in short, a major financial and technical investment. In order to accurately diagnose the sex of the pre-embryo, techniques of Fluorescent In Situ Hybridisation (FISH) and Polymerase Chain Reaction (PCR) need to be exacting, reliable, sensitive and should avoid contamination with other sources of DNA.

The investment will not be rewarding

to the doctor unless preimplantational sexing is carried out on a large scale. Couples undergoing IVF for infertility may even be told of this possibility, putting a greater financial burden on them and preventing them from trying again should the first attempt fail.

The woman would have to take medication and hormones for superovulation, bear the risk of ovarian hyperstimulation, undergo an operative procedure under anaesthesia, have the oocytes fertilised in the laboratory. After looking for fertilisation and then embryo cleavage, a single-cell embryo biopsy would have to be done at the 6- to 8-cell stage. The procedure of biopsy itself has a learning curve and in the process many embryos would be annihilated.

The single cell would then be subjected to the FISH procedure while

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the rest of the embryo awaits the verdict. The process of waiting takes 8 to 24 hours depending on the procedure used. If culture conditions are not fulfilled, the embryo may degenerate or not cleave further.

Implantation rates for IVF are in the range of 20% with pregnancy rates in the range of 20 to 40%. Hence for every 10 such procedures done for sexing, 2 to 4 would culminate in a pregnancy. Miscarriage rates are about 20 to 25% so at the end of the day if 100 couples underwent the IVF procedure for the sole purpose of having a child of a preferred sex, 30 women would get pregnant and 24 would take the pregnancy to term. The cost of this entire exercise would work

out to Rs. 2 lakh per attempt. Multiply this by 100 to get the figure of Rs 2 crore. With 24 successes, each successful attempt would then cost Rs. 8.5 lakh. When the IVF attempt results in all embryos of the undesired sex. Will they be thrown out and the couple asked to try again?

Only well established centres with reasonable pregnancy rates could consider offering genetic services for medical conditions.

Technically the process needs expertise in the fields of IVF, embryology and genetics.

In a society such as ours where the female child is disadvantaged from the day she is born, encouraging technology which promotes the birth of males while destroying females will only nurture the inequality and injustice to the Indian girl and woman. The whims of the rich will be catered to. The not-so-very rich and the very poor will also mortgage their homes and belongings in the pursuit of technology which could ultimately destroy the very fabric of society.

Those in favour of sex selection may try to justify its use for balancing the family. However, in our country this balance is already tilted towards procreation of the male child and would further upset the sex ratio in favour of the male.

This is not to deny the importance of PGD for parents carrying genetically determined conditions such as Tay-Sachs Disease, Fragile X syndrome, Down's Syndrome and Cystic fibrosis. One is conversant with the role of molecular genetics in mapping of oncogenes against cancer. However, using PGD for the purpose of sex selection will be detrimental to the Indian woman and could encourage the practice of corruption in this medical field.

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