

In Fertile Territory

With Assisted Reproductive Techniques (ART) and Pre-implantation Genetic Diagnosis (PGD), the TMC Fertility Centre at Tropicana Medical Centre offers high hopes of baby success for couples that might otherwise have little.



"From January to October 2011 we had a 62.1 percent success rate with IVF procedures," explains Dr. Navdeep Singh Pannu, Consultant Obstetrician, Gynaecologist & Fertility Specialist at the TMC Fertility Centre at Tropicana Medical Centre in Kota Damansara.

Reiterates Dr. Surinder Singh, Consultant Obstetrician, Gynaecologist & Fertility Specialist, who is also the Head of the TMC Fertility Centre, "Our pregnancy rates are comparable to, if not better than, the national IVF average in countries like the United States and United Kingdom. We do about 700-800 IVF cycles a year and have a 60 percent success rate."

Started in 1994, the TMC Fertility Centre now has branches in Johor Bahru, Penang, Kuantan, Puchong and Kepong. In March 2012, TMC celebrated the birth of its 3000th baby by In Vitro Fertilisation, or IVF.

Assisted Reproductive Techniques

Not being able to have a baby, to fulfil what many consider to be a natural part of their personal evolution in life, can be a very painful experience indeed.

"I would listen to my wife quietly crying into her pillow at night wondering why she couldn't carry a baby to term," explained Mr. J. "It was a painful, painful time for us."



Dr. Surinder Singh, Consultant Obstetrician, Gynaecologist & Fertility Specialist, who is also the Head of the TMC Fertility Centre.



Dr. Navdeep Singh Pannu, Consultant Obstetrician, Gynaecologist & Fertility Specialist at the TMC Fertility Centre.

Luckily for Mr. J and others like him, since the birth of one Louise Brown, the world's first 'test tube baby', on 25th July 1978, Assisted Reproductive Techniques (ART) have grown and improved in leaps and bounds. In Malaysia, the TMC Fertility Centre offers hope to many couples, both local and from around the world (about 15 to 20 percent of the Centre's patients are foreigners).

How is infertility defined?

"If a couple is under 35 years of age, they might want to be checked for infertility after a year of unprotected intercourse. If they're over 35, then they should have a check up after six months of trying," explains Dr. Navdeep.

"When a couple first comes to the TMC Fertility Clinic, the wife can expect to have an ultrasound done of her reproductive organs. Blood will be taken to check the levels of her hormones – luteinising hormones, follicular stimulating hormones and estradiol. Her fallopian tubes are checked to see if they are clear. The husband's semen is also analysed for motility and quality. Treatment will then be discussed depending on the outcome of these tests."

• Intrauterine Insemination (IUI)

If the wife is under 35 and has patent fallopian tubes, and the husband's sperm is at least of average quality, then the least invasive (and cheapest) option is Intrauterine Insemination (IUI).

"With the IUI technique, injections are administered to the wife for seven to eight days, followed by medication for five days to stimulate the ovaries into producing eggs," explains Dr. Navdeep. "A final injection of human chorionic gonadotrophin (HCG) will then trigger ovulation. Once ovulation occurs, the husband's sperm, which is processed to obtain the best quality swimmers, is injected into the womb. This increases the likelihood of pregnancy as the eggs and sperm are placed together in the same space where, hopefully, they will meet and fertilisation will take place."

At TMC Fertility Centre, the pregnancy success rate at first try with IUI is 15 to 20 percent. The cumulative success rate after three tries is 45 percent.

• In Vitro Fertilisation

If IUI is not suitable for a couple or fails, then there is In Vitro Fertilisation (IVF), which, as mentioned earlier, at the TMC Fertility Centre has a pregnancy success rate of over 60 percent.

The first step with IVF is hormone suppression. Then there is controlled ovarian hyperstimulation, which, depending on the age of the patient, has different protocols (long, short or antagonist). Ovarian stimulation is basically done through a series of

HOW MUCH DOES IT COST?

ASSISTED REPRODUCTIVE TECHNIQUES

- Intrauterine Insemination (IUI): RM2,000 per try
- In Vitro Fertilisation (IVF): RM15,000 per cycle

PRE-IMPLANTATION GENETIC DIAGNOSIS

Charges are in addition to IVF charges.

- Fluorescent In-situ Hybridisation (FISH): RM13,000
- Polymerase Chain Reaction (PCR): RM11,000
- microarray Comparative Genomic Hybridisation (mCGH): RM15,000.

(The chips used in mCGH testing are RM800 per chip, and 24 chips are needed to check all chromosomes.)

injections of follicular stimulating hormones and luteinising hormones. These are administered by the patient herself at home with an easy-to-use injection kit. The patient will also see the doctor two to three times during this period, when he will check for estradiol levels and will do a transvaginal ultrasound to measure the follicles. Once the eggs are big enough, an HCG injection is administered for final maturation. When the eggs are ready, they are picked up with a needle attached to a vaginal probe. Ten to 15 eggs are collected.

On the same day, a semen sample, produced after three to five days of abstinence from sex, is obtained. If the husband has to be away for some reason during this time his sperm can be collected earlier and frozen for later use. If necessary, sperm can also be surgically retrieved through such methods as Percutaneous Epididymal Sperm Aspiration (PESA), Testicular Sperm Aspiration (TESA) and Testicular Sperm Extraction (TESE).

Insemination of the egg by the sperm is done in the laboratory simply by placing them together in a petri dish. In some cases, it might be necessary to perform Intracytoplasmic Sperm Injection (ICSI) – where the sperm is injected into an egg. This is usually done in cases of failed IVF, if the wife has few eggs, in cases of severe male factor subfertility or where sperm was surgically retrieved or cryopreserved.

Once insemination has occurred, the petri dish is kept in an incubator. The following day it is checked to see if the cells are multiplying. At this time, if there are any worries regarding chromosomal or genetic abnormalities in the potential baby, the TMC Fertility Centre also offers Pre-implantation Genetic Diagnosis (PGD). More on this later.

After this, within three to five days of fertilisation, two embryos are placed in the woman's womb to implant. Extra embryos are kept for future attempts or future babies.

After placement of the embryos in the



Labwork, lab design and high standards in operating procedures are critical to success in IVF.

womb, the patient must refrain from strenuous activity and sex for two weeks. Pregnancy is then diagnosed within two weeks with a blood test; a little later with a urine test; or by vaginal or ultrasound scan within three to four weeks.

Pre-implantation Genetic Diagnosis

As earlier mentioned, if there is any reason to suspect abnormalities in the fertilised eggs, they can be checked at a very early stage of cell division with PGD.

“Some 70 percent of miscarriages are due to abnormalities in the foetus,” explains Dr. Surinder Singh, who has lectured on IVF and PGD in China, Bangladesh and Cambodia.

“The basic premise of Pre-Implantation Genetic Diagnosis (PGD) is that we are already doing IVF – taking eggs from the wife and sperm from the husband. PGD means that we are able to do a genetic test to verify if the baby will be healthy before we place it in the mother’s womb.”

Of over 28 IVF centres in Malaysia, the TMC Fertility Centre is one of a few to offer PGD – which it started in March 2004. To date, they have done about 558 cycles, most of which were day three biopsies. The first PGD baby born at TMC was on 5th December 2004.

How is PGD testing done? After the mother’s eggs have been fertilised in the lab, the eggs will divide into individual cells known as blastomeres. PGD is performed by removing one of the blastomeres through a biopsy on either the third or fifth day after fertilisation. The collected blastomere is then tested for abnormalities or genetic disorders through any of three types of tests offered at the TMC Fertility Centre.

• Fluorescent In-situ Hybridisation (FISH)

Firstly, there is the Fluorescent In-situ Hybridisation (FISH) test, which checks for five different chromosomal disorders. This was the first PGD test offered at TMC in 2004. This test checks for additional or a shortage of chromosomes which can lead to trisomies 13, 18 and 21 (Patau Syndrome, Edward’s Syndrome or Down Syndrome respectively) as well as several X and Y chromosomal anomalies.

• Polymerase Chain Reaction (PCR)

Since 2009, TMC has also offered the Polymerase Chain Reaction (PCR) test which tests for genetic disorders such as Alpha-Thalassaemia, Beta-Thalassaemia and Haemophilia. Given that one in every 20 Malaysians is a Thalassaemia carrier – with similar rates seen across Southeast



Centrifugation of sperm is part of the sperm processing technique.

Asia, China and the Mediterranean – this test is an important one. Babies that are Alpha-Thalassaemic usually die in the womb or soon after birth.

• Microarray Comparative Genomic Hybridisation (mCGH)

Since July 2010, TMC has also offered the microarray Comparative Genomic Hybridisation (mCGH) test, which can check for abnormalities in all 24 chromosomes. Results are reliable and accurate. As of March 2012, Dr. Surinder had done over 60 cases of mCGH, with a pregnancy rate of 60 percent.

Dr. Surinder, who played an instrumental role in establishing the PGD department at TMC Fertility Centre, says that the labwork is critical to success in PGD – and all IVF – procedures.

“Embryo biopsy techniques are very important to success. Lab design is also very important. We have standard operating procedures in place that are of the highest standard so that results are accurate,” he explains. “We have nine embryologists and a geneticist. We also have strict lab controls which means that our staff are not allowed to wear makeup or perfume.”

In a few months, there will be even newer technology coming on to the market – CGH for single gene disorders, which will all be on one chip. Dr. Surinder believes that this will, in time, overtake all the other tests. Rest assured that TMC Fertility Centre will be one of the first to offer any new techniques and tests that are successful in making babies.

**For more information, go to:
www.tmcfertility.com.**

