



## An analysis on Test Tube Baby

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**Abstract:** Test tube babies are babies that are created in a test tube by taking one sperm cell and one egg cell and combining them. So the baby starts to develop in the test tube and is then implanted into the mother's uterus. Test tube babies are also called 'in vitro babies'. It literally means "in glass". In vitro fertilization (IVF) is a process by which egg cells are fertilized by sperm outside of the womb, in vitro. IVF is significant for people who are unable to conceive, it helps in achieving ultimate safe pregnancy and a healthy baby. It helps people in realizing their dream of having a baby. IVF may be unsuccessful and patients need to undergo several IVF cycles of treatment before getting successful pregnancy. If IVF failed, women need to undergo from the initial step of treatment until they are successful.

**Key words:** In vitro fertilization, test tube baby, sperm outside

### INTRODUCTION:

Test tube babies are babies that are created in a test tube by taking one sperm cell and one egg cell and combining them. So the baby starts to develop in the test tube and is then implanted into the mother's uterus. Test tube babies are also called 'in vitro babies'. It literally means "in glass". In vitro fertilization (IVF) is a process by which egg cells are fertilized by sperm outside of the womb, in vitro. IVF is a major treatment in infertility when other methods of assisted reproductive technology have failed. The process involves

hormonally controlling the ovulatory process, removing ova (eggs) from the woman's ovaries and letting sperm fertilise them in a fluid medium. The fertilized egg (zygote) is then transferred to the patient's uterus with the intent to establish a successful pregnancy. The first test tube baby was born in 1978. The term in vitro, from the Latin root meaning within the glass, is used, because early biological experiments involving cultivation of tissues outside the living organism from which they came, were carried out in glass containers such as beakers, test tubes, or petri dishes. Today, the



term in vitro is used to refer to any biological procedure that is performed outside the organism it would normally be occurring in, to distinguish it from an in vivo procedure, where the tissue remains inside the living organism within which it is normally found. A colloquial term for babies conceived as the result of IVF, test tube babies, refers to the tube-shaped containers of glass or plastic resin, called test tubes, that are commonly used in chemistry labs and biology labs. However in vitro fertilisation is usually performed in the shallower containers called Petri dishes

### **History:**

The first pregnancy achieved through in vitro human fertilisation of a human oocyte was reported in *The Lancet* from the Monash team in 1973, although it lasted only a few days and would today be called a biochemical pregnancy. This was followed by a tubal ectopic pregnancy from Steptoe and Edwards in 1976, resulting from the successful partnership with Bob Edwards, which resulted in the birth of Louise Brown on 25th July 1978, followed by Courtney Cross on 16th October 1978 and Alastair

MacDonald on 14th January 1979, the world's first, second and third IVF babies. This was followed by the birth of Candice Reed in Melbourne in 1980.

It was the subsequent use of stimulated cycles with clomiphene citrate and the use of human chorionic gonadotrophin (hCG) to control and time oocyte maturation, thus controlling the time of collection, that converted IVF from a research tool to a clinical treatment. This was followed by a total of 14 pregnancies resulting in nine births in 1981 with the Monash university team. The Jones team[12] at the Eastern Virginia Medical School in Norfolk, Virginia, further improved stimulated cycles by incorporating the use of a follicle-stimulating hormone (uHMG). This then became known as controlled ovarian hyperstimulation (COH). Another step forward was the use of gonadotrophin-releasing hormone agonists (GnRHA), thus decreasing the need for monitoring by preventing premature ovulation, and more recently gonadotrophin-releasing hormone antagonists (GnRH Ant), which have a similar function. The additional use of the oral contraceptive pill has allowed the scheduling of IVF cycles, which



has made the treatment far more convenient for both staff and patients.

The ability to freeze and subsequently thaw and transfer embryos has also significantly improved the effectiveness of IVF. The other very significant milestone in IVF was the development of the intracytoplasmic sperm injection of single sperms by Andre van Steirtegham in Brussels, 1992. This has enabled men with minimal sperm production to achieve pregnancies, sometimes in conjunction with sperm recovery, using a testicular fine needle or open testicular biopsy, with some men with Klinefelter's syndrome occasionally achieving pregnancy. Thus, IVF has become the final solution for most fertility problems, moving from tubal disease to male factor, idiopathic subfertility, endometriosis, advanced maternal age, and anovulation not responding to ovulation induction.

#### **First tube baby case in India:**

Thirty years ago, two city gynaecologists made history when they delivered Mumbai's first test tube baby. On Monday the duo – Dr Indira Hinduja and Dr Kusum Zaveri – assisted that baby, now a

29-year-old Harsha Shah, to give birth. Thirty years ago, two city gynaecologists made history when they delivered Mumbai's first test tube baby. On Monday the duo – Dr Indira Hinduja and Dr Kusum Zaveri – assisted that baby, now a 29-year-old Harsha Shah, to give birth. Shah gave birth to a boy after a caesarean section at Jaslok Hospital in Mumbai. Shah, who was born with the aid of assisted reproduction technology on August 6, 1986 at KEM Hospital, had conceived naturally within months of her marriage.

A pioneer in assisted reproduction technology in the country, Dr Hinduja said Harsha's delivery was significant and encouraging for couples looking to try in vitro fertilization (IVF) for conceiving. "Many couples are worried whether the baby born through IVF will be able to conceive naturally. Harsha's baby is a proof that babies born through IVF are as normal as any other child," said the doctor who runs a fertility clinic at a private hospital in Mahim. Shah's baby was born healthy, weighing 3.1 kilograms, and was delivered by the same team of medical professionals who delivered Harsha years ago.



Dr Hinduja started experiments in IVF in 1984 on animals at KEM Hospital in Parel. On December 2, 1985, her team successfully transferred an embryo prepared in a petri-dish into Harsha's mother's womb, the first time in India where such an attempt was made. "Harsha's mother, Maniben, had suffered from tuberculosis, which had permanently damaged her fallopian tubes. She was desperate to have a baby, and when we explained the new technique to her, she agreed to it immediately," she said. "We did the procedure and spent the next few days praying that it would be successful," added Dr Zaveri.



Dr Indra Hinduja (left) and Dr Kusum Zaveri (Right) who were part of the team that helped during

Harsha's birth during 1986, were present when the 29-year-old delivered. (HT Photo). The doctors were naturally thrilled at the medical implications of Harsha's delivery, but for the new father, Divyapal Shah, his son's birth was a natural fact. "We had planned this baby. We didn't have any apprehensions about Harsha or the baby. We are a normal family and I am as happy as any father in the world would be," said the businessman from Matunga. For Dr Hinduja, Harsha's birth will always be a special occasion, and the two share a special bond. "Coincidentally, Maniben's pregnancy test came positive on my birthday. There was an international conference going on at KEM and a senior doctor interrupted it to announce the big news of the pregnancy," she recalled. The doctor also blessed Shah at her wedding in May last year.

### IVF Procedure steps

#### 1.Ovaries Monitoring + IVF Hormonal Induction:

Initially the ovaries are made inactive for a short period to ensure their better response to ivf hormones injection and avoid early production of eggs before the



collection period. It is called as downtime regulation step under which patient is asked to notice her menstrual cycle and her blood sample is taken on the first day of her period.

**2.Ovarian Stimulation:** Ovarian stimulation is begun after verifying the dropped estrogen levels during ivf and thinning of uterus lining. Follicle Stimulation Hormone (FSH) injections are given every day during the treatment. Following the injection response in female's body, when follicle's size in vagina is suitable and hormones are suitably balanced, an ivf hcg trigger injection is given to activate ovulation, through which woman produces several eggs.

**3.Sperm Ejaculation:** Husband is invited for ejaculation for collection of sperms in order to conduct eggs fertilization. He needs to produce the sample in other room inside the clinic while or subsequent to egg collection. To avoid any kind of delay, clinic usually arranges for father's sperms or donor sperms in advance of fertilization in few cases such as poor or frozen sperm quality.

**4.Egg Retrieval:** Egg collection procedure is followed regularly under cautious sedation. The

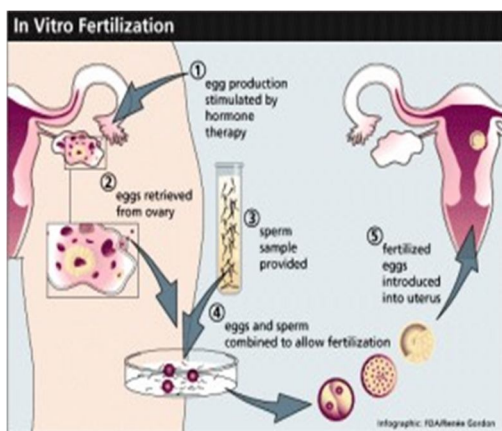
patients should avoid eating or drinking anything from midnight the night prior, unless otherwise advised.

**5.Fertilization:** Extreme verification protocols are followed to provide confirmation that eggs, sperms and embryos utilized in a specific individual treatment belong to the couple. Sperm or donor sample is prepared by isolating the moving sperm from semen. The motile sperm is kept in a dish for treatment. Individual sperm is then injected into every mature egg and then kept in the incubator for the whole night to allow fertilization. Fertilized eggs are named embryos and after the development of embryos, the cell division occurs.

**6.Embryo Transfer:** The most challenging step is to recognize and choose the best embryo for transfer. The selection is mainly done through a technique of embryo grading that is based on strict observation and rating of embryo that started cell division. The healthiest embryos are transferred into female's uterus. It is a more straightforward step as compare to egg collection.

**7.Implantation + After Check**  
To confirm that uterus lining is ready to receive an embryo, a

patient is given daily progesterone injections, in case she experiences pain, the vaginal gel preparations of progesterone or tablets are given. Right here, the waiting period begins to observe that if embryo is implanted successfully and development started. After two weeks of embryo transfer, a pregnancy test is conducted subsequent to which you will receive an exit date from the clinic.



### III. Ivf Symptoms:

Patients who receive IVF treatment usually experience spotting or irregular periods after two weeks of implantation. The embryo burrows into uterus causes pains and bleeding. It shows the pregnancy however does not confirm. Variation in breast can be the best symptom of IVF pregnancy. To ensure success rates, choose

the **Best IVF Treatment Centre in India.**

### IV. Age Limit of Women for IVF procedure:

The natural fertility capacity significantly decreased in women at age 40. They also look at substantially lower pregnancy rates in **IVF for women over 40.** Fertility in women above age 35 is a complicated challenge. The risk rates are higher in **IVF at 45.** However it all depends on the egg quality. If the eggs produced are healthy and embryo is also developed suitably, ivf over 50 would be also be successful. The age limit for vitro simply depends on capacity of female that how she holds the implantation.

**V. Advantages of IVF :** IVF is significant for people who are unable to conceive, it helps in achieving ultimate safe pregnancy and a healthy baby. It helps people in realizing their dream of having a baby.

### VI. Disadvantages :

IVF may be unsuccessful and patients need to undergo several IVF cycles of treatment before getting successful pregnancy. If **IVF failed**, women need to



undergo from the initial step of treatment until they are successful.

- **Patient's age:** with increasing such as above 40, success rates decrease widely in IVF.
- **Embryo Quality:** Embryos with genetic or chromosomal problems are extremely weak that they do not work for this treatment
- **Ovarian Response:** If ovaries do not respond well to IVF medications such as in case female cannot produce multiple eggs in response to IVF injections.
- **Implantation problems:** in many cases when IVF fails, the reason is poor implantation. It is because the growth of embryo stopped unknowingly however there is no one to blame for it. Implantation problems occur in around 50 percent of cases.

In IVF procedure, usually many embryos are placed into uterus that result in to IVF multiple births in 20 to 30 % cases. The minor chances of developing side effects may also be associated as IVF risks such as development of ovarian hyper stimulation syndrome or OHSS. Further the kids with birth defects such as problems in eyes, heart and other parts have yet not been confirmed that whether these

are IVF birth defects or because of female's fertility issues.

**Follicle size for ivf :** The ivf follicle size should be minimum 15mm or more to produce eggs. For this HCG injection is given, after 36 to 40 hours of which, eggs undergo their maturation process to become able for fertilization.

**Ivf reviews :** Check out what our patients are saying about the successful IVF treatment that they have received at our **IVF Center in India.**

**Ovarian simulation :** In order to achieve successful pregnancy, woman patient must produce several good quality eggs. The ovarian simulation medicines are prescribed to patient to activate the ovaries for the production of sufficient follicles and eggs.

**Celebrity ivf :** There are number of celebrities who have chosen IVF for fertilization. Don't be surprised even Nicole Kidman and Celine Dionne are celebrities who chose IVF treatment to become parents.

**Is IVF painful?** Sometimes implantation is found painful in women, for this pain free injections or tablets are given to conduct embryo implantation painlessly.



**IVF children:** IVF helps couples in giving birth to babies of own genes. The IVF children grow naturally without any defects depending on the age of female when she becomes pregnant and causes of infertility. However the defects chances are rare.

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