

In-Vitro Fertilization (IVF) Concept According to Modern Medical

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Abstract

In this modern age, the development of science and technology is growing rapidly. In 1970, the medical technology of human reproduction produced fertilization that occurred outside the womb, where in medical terms it is called In Vitro Fertilization (IVF) or better known as a test tube baby. The discovery of IVF has provided many benefits for infertility cases as well as a solution for married couples who cannot have children through natural methods. Thus, the objective of this concept paper is to explain the meaning of IVF according to modern medical, the implementation process, the types of IVF babies and the relationship between IVF babies and surrogacy. This conceptual study used content analysis method from secondary data. These secondary data were obtained from scientific books, articles in journals, authoritative websites, papers, seminar papers, proceedings and others. Hopefully this concept article will give understanding to the community regarding IVF babies.

Keywords: Concept, Test Tube Babies, Modern Medical.

Introduction

Child brings a lot of meaning to a family institution. There is no happiness in a marriage when they are not be blessed with a child as a complement of a family that may lead to a family breakdown which can cause polygamy and divorce. The destruction of a family institution caused by a case of sterility generally occurs regardless of who is the cause of the sterility either the husband or the wife.

So far, various medical technology discoveries have appeared in the field of genetic formation that can provide solutions to married couples who cannot have children through natural means. Artificial reproduction through test tube babies is a new method that has been considered a scientific discovery, known as IVF, which is fertilization outside the womb. Advances in medical technology as this, which is considered as an alternative for those who want to have offspring, will not only solve the problem, but will also bring up new problems related to the maşlahah of the people, especially regarding the lineage of children to be born.

IVF Baby Concept According to Modern Medical

In the last two decades, science and technology in the medical field have developed very rapidly. One of today's technologies that has helped many couples get offspring is through In Vitro Fertilization (IVF) or more popularly called test tube baby. The test tube baby method is an achievement from the collaboration between medical experts and pharmaceutical technologists, where sperm and ovum are joined outside the womb in a tube that has been prepared in advance to carry out the process. Then after fertilization, it will be placed into the woman's womb that has been prepared. This test tube baby method can help to produce a baby as it is obtained in a natural way (Zubaidah, 2002).

IVF Baby Concept

In vitro fertilization (IVF) is a fertilization technique in which the ovum is fertilized outside the female body. The process consists of the hormonal control of the ovulation process, the transfer of the ovum from the ovary and fertilization by the sperm into a liquid medium. IVF is a reproductive technology with the technique of putting sperm into a woman's vagina and was first successfully practiced in 1970. The early development of IVF started from the discovery of sperm preservation techniques. Sperm can survive for a long time about 6 months or more (Arroyan, 2017) when stored in glycerol placed in liquid nitrogen at a temperature of -321 degrees Fahrenheit (Semiawan, 2007).

Initially, this method was aimed to help married couples who do not have offspring naturally due to permanent damage to the fallopian tubes (egg tubes) of their wives. The fallopian tube is a female internal organ that connects the ovaries and the uterus, through which the female egg will pass through a channel about 10 cm long. There are no specific signs that can be seen if the woman faced with a problem, but it can silently affect women's fertility (Dain, 2017). The existence of this technology can help married couples who have diseases or other complications that prevent the possibility of obtaining offspring (Yendi, 2011).

The Definition of IVF Baby

IVF baby is an individual (baby) who was processed outside the woman's body (in vitro), or in other words a baby whose formation process is achieved through artificial reproduction, which is a way of inserting sperm into a woman's vagina without physical contact (Tahar, 1987).

A test tube baby (IVF baby) as it is known is a baby that is the result of a fertilization process carried out outside the womb until the embryo is formed unnaturally, but with the help of medical science (Hasan, 2000).

(a) The Definition of Test Tube Babies According to Language

The term of test tube baby comes from a foreign language which is In Vitro Fertilization (fertilization done in a tube). Test tube babies are not literally babies raised in tubes. It is a process of combining the sperm and ovum that is done outside the body, in a medium or tube. In the medical field, this process is better known as In Vitro Fertilization and Embryo Transfer (IVF-ET) (Ismail, 2017).

(b) The Definition of Test Tube Babies According to Modern Medical term

According to Ali Ghufron and Adi Heru Sutomo, a test tube baby is a man's semen that is first, adapted and then placed into a woman's womb (Ghufron & Sutomo, 1993).

While according to Anwar and Raharjo quoted by Ali Ghuftron and Adi Heru Sutomo, test tube babies are a shortcut to bring sperm and ovum together outside the body which are then inserted into the woman's uterus, so that they can grow into a fetus like a normal pregnancy (Ghuftron & Sutomo, 1993). Masyfuk Zuhdi says that there are several artificial reproduction technologies that have developed in medical field, among them is through the method of taking the husband's sperm and the wife's ovum, then processed in vitro (tube) and after fertilization, it was transferred into the wife's womb (Zuhdi, 1993).

From these three definitions of the test-tube baby, it can be concluded that a test-tube baby is a baby is not a product of sexual intercourse, but it is a product when male sperm and female ovum were combined after being placed in a tube for a period of several days, after Fertilization occurs and it has been considered capable of becoming a fetus, then it was inserted into the woman's womb (Mahfudh, 2004), so that it can grow into a fetus as a fetus in general. Test tube babies are also known as artificial reproduction, which is an activity to work on the birth of a child by performing fertilization without having sexual intercourse between a legal husband and wife, but by bringing together a man's sperm with a woman's ovum through a certain process such as injection (Rashid, 2003).

The above definition of male sperm is only the sperm that comes from her husband and it can also come from other man who does not have infertility problems. While the meaning of woman's ovum here refers to the ovum that is taken from his wife or from a woman who is not his wife. The same goes for the meaning of a woman's womb, it can only be his own wife's womb or other woman's womb.

Implementation Process of Test Tube Baby

The test tube baby process is sperm and ovum that have been combined in one tube, after fertilization it will be inserted into the woman's uterus, until the time the baby is ready to be born.

The test tube baby technique has several levels which are as follows (Sudrajat, 2008)

- a. Ovarian stimulating medication. In this phase, the wife will be given medicine to stimulate the ovaries to produce many ovums.
- b. Ovum collection.
- c. Fertilization between ovum and sperm in a laboratory tube, then bred in a test tube container, for 18 to 20 hours.
- d. Embryo transfer. An embryo will be formed after the fertilization of the ovum and sperm. The embryo is transferred into the mother's uterus through the vagina after 2 to 5 days.
- e. Supervision of pregnancy occurrence. After the embryo is transferred, it continues with the pregnancy test process.

The aim of taking fertility medicine is to help the ovaries prepare mature eggs that can be fertilized immediately. In a normal menstrual cycle, there is one egg released every month. By taking this medicine, the number of released eggs will increase so that pregnancy can occur. Next, hormone injections were given for 12 days to stimulate the ovaries to release more mature eggs (ovulation induction). The hormones used are gonadotrophins follicle stimulating hormone (FSH) and luteinizing hormone (LH).

Supporting check up in the form of ultrasonography (USG) and examination of blood hormone levels may be recommended to evaluate the egg cell responses to the hormone injection. An ultrasonic examination is performed to assess the readiness of the egg cells to be retrieved

and fertilized. The mature egg cells will then be taken by the doctor from the ovary directly using a thin needle attached to the end of the ultrasonic scanner. This procedure may cause discomfort and painkillers can be given to reduce the pain (Veratamala, 2017).

Within a day after combining the sperm and egg cells, the cup that containing both is checked whether the fertilization has occurred or not. If fertilization has occurred, the fertilized egg will be stored for 3 to 5 days in a special place to be implanted back into the uterus. The fertilized egg will then divide eventually form a zygote. The healthiest zygote will then be put back into the womb (Veratamala, 2017). Overall, the process of making a test tube baby can last from one to six months. The likelihood of the success of this procedure will depend on the fertility faced by the couple and the age of the woman. The younger and healthier the egg cells, the higher the success rate. If the mother-to-be has previously been pregnant and given birth, then the possibility of success is higher. The test tube baby procedure is intended to solve the problem of married couples who were not able to have offspring due to a situation in which one or both of them are infertile so that natural fertilization is not possible.

According to Indonesian medical expert Budi Wiwiko, who is a fertility consultant at Cipto Mangunkusumo Hospital (RSCM). He explained that test tube baby method is used when a married couple has abnormal sperm conditions such as the number, movement, and shape there is an abnormality and also if there is a blockage in both oviducts. Therefore, the sperm and ovum cannot meet in the womb and must be assisted from outside the womb with the test tube baby method (Health, 2014). The status of infertility in men is usually caused by the low number of sperm cells found in semen, as well as the quality of sperm cells that do not reach the standard. So based on the quantity and quality of sperm cells found in one millimeter of semen, male infertility can be grouped as follows:

- a. Oligozoospermia, which is a condition in which there are only a few hundred sperm cells.
- b. Cryptozoospermia, which is a condition where the number of cells can only be found in a few dozen or less.
- c. Asthenopermia, which is a condition where sperm cells do not have the ability to move freely to find the ovum. Sperm cells with abnormalities in the tail, but the condition of the sperm head (gene carrier) is still good.
- d. Azoospermia, which is a condition where mature sperm cells are not found (Mohammad, 1992).

However, infertility among women is caused by damage to the layer of the fallopian tube (egg tube), blockage of the fallopian tube due to repeated infections in the internal genitalia, abnormal ovulation (the process of releasing eggs from the ovary), and endometriosis (estrogen-dependent disorders which can result in high pain) (Utusan Online, 2016). To overcome that, technological advancements in medical field have been able to provide a solution to married couples who are infertile and cannot have offspring through the natural fertilization process, but have the possibility of obtaining a child in scientific way. The fertilization technology is known as the Assisted Reproductive Technology (ART) system (Overall, 1987).

ART is a medical procedure that is used to unite ovum and sperm in order to overcome the problems that occur in infertile married couples in obtaining offspring. Based on the techniques used, ART can be categorized into 4 (four) methods, In Vitro Fertilization (IVF), Zygote Intra Fallopian Transfer (ZIFT), Intra Cytoplasmic Sperm Injection (ICSI) and Gamete Intra Fallopian Transfer (GIFT). From these four ART methods, IVF is the most widely used

method to overcome difficulties faced by married couples who cannot conceive naturally or for cases of infertility couples who have been expecting offspring for a long time (Nardelli et al., 2014).

Types of Test Tube Babies

From the terms of sperm and ovum and where the zygote or embryo is transplanted, test tube babies can be divided into 8 types, namely

1. A test tube baby that uses sperm and ovum from a married couple, then the embryo is placed back into the wife's womb.
2. A test tube baby that uses sperm and ovum from a married couple, then the embryo is transferred into the womb of a surrogate mother.
3. A test tube baby that uses sperm from the husband and the ovum comes from a donor then the embryo is transplanted into the wife's womb.
4. A test tube baby whose sperm comes from a donor, while the ovum uses the wife's ovum, then the embryo is transferred into the wife's womb.
5. A test tube baby whose sperm comes from a donor, while the ovum comes from the wife, then the embryo is transferred into the womb of the surrogate mother.
6. A test tube baby that uses sperm from the husband, while the ovum comes from a donor, then the embryo is transferred into the womb of the surrogate mother.
7. A test tube baby that uses sperm and ovum from a donor, then the embryo is transplanted into the wife's womb.
8. A test tube baby whose sperm and ovum come from a donor, then the embryo is transferred into the womb of a surrogate mother (Salim, 1993).

Fertilization is only permitted if it comes from a legal marriage bond. Therefore, this kind of reproduction deserves attention. The eight types of test tube babies that have been mentioned above are technologically possible, but in the cases of the implementation of the test tube baby method only include five types, namely: the first, second, third, fourth and seventh types. Why are these five types already implemented but not others? This is because the situation of a married couple when they want a child is to choose one of the five types, and the choice is depend on the factors that cause their infertility (Salim, 1993).

The Relationship Between Test Tube Babies and Surrogate Mothers

In the modern era, science and technology of the medical world have experienced extraordinary advancement. One of the results is the discovery of new techniques to produce human which medical term is called as In Vitro Fertilization or better known as the test tube baby method. Test tube baby or in vitro fertilization is a technique of fertilization of sperm and egg cells (ovum) that occurs outside the female body. This is one method to solve the problem of infertility when other methods have failed to solve it (Directorate of Medical Services, 2000).

Based on the explanation about test tube babies, it can be concluded that the relationship between a test tube baby and a surrogate mother is legal if both seeds come from a legitimate husband and wife. The types of test tube babies that are not allowed in Islam are:

- a. Sperm and ovum that have been fertilized are placed into the womb of another woman who is not his wife or commonly referred to as a surrogate mother.

- b. The husband's sperm with other woman's ovum, even though the fertilized ovum was inserted into the wife's womb.
- c. The fertilization process occurs between sperm and ovum that do not belong to the married couple, even though the fertilized ovum is placed back into the wife's womb (Bahraen, 2011).

From these three situations, the problem of surrogacy is associated with the first type, which is sperm and ovum originating from a husband and wife placed in the uterus of another woman with a rental agreement. Therefore, the surrogacy method is said to be part of the test tube baby method (Mahfudh, 2004).

Conclusion

Islam is a simple religion. The laws are also flexible and always change with the passage of time. However, the change in the law must comply with the requirements and conditions that have been set by Islam. Test tube babies are indeed very helpful for wives or husbands who are unable to give birth naturally. However, it will bring other legal implications if the seed fertilized with the wife's ovum is from the seed of someone other than her husband. This will arise other problems involving lineage and descendants. Therefore, Muslims who want to use the test tube baby method or In Vitro Fertilization (IVF) should be careful and consult a Muslim midwife in carrying out this procedure. All this is to ensure that this IVF method is done in the right way and that there are no lineage problems in the future.

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