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Male Perspective of Infertility and Germ line Gene Therapy: An Islamic and Medical Perusal

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Abstract Infertility is a phenomenon that not only gives tough time to females but it equally affects male partners. Due to the quiet nature of males and communication gap with female partners they tend to hide their feelings of being incomplete and being not sharing these things could develop thoughts of suicide and can drag them to endless emotions of depression. While discussing the sexual and reproductive health noting all the facts and figures regarding maternal mortality and factors leading towards couple's fertility it becomes necessary to discuss infertility in detail and conceptualizing this phenomenon from perspective of religion. From clinical point of view, number of couples seeking help in conceiving fall under the criteria of infertility. Although there many reasons behind infertility as sexual history, age etc. but in this paper male infertility is the focus that sub fertile men have missing Y-chromosome, which effects the number of sperms and passes the infertility to the off springs. ICSI born child are affected by abnormal structure of chromosome and increased sex chromosome disorders. The birth defect rate is more in ICSI born child and the formation of embryo is abnormal due to which the embryo does not implant in the womb and fail to grow, which lead to miscarriage. Chromosomal defects can be cured by Germline Gene Therapy. Within less than two decades, it has made pace from laboratory research to clinical translational trials for variety of deadly diseases. Most notable are: (ADA-SCID), (CGD), Hemophilia, cancer, neurodegenerative disease. HIV, hepatitis, congenital blindness, lysosomal, storage disease and muscular dystrophy. This article discusses the theme and the procedures of Germline therapy and proposes its effectiveness to make infertile couples aware about causes of infertility and female medical specialists must also focus on male infertility factors by avoiding the phenomenon of reluctance. Moreover, it is indispensable to make people educate about the fact that being infertile is not a shame but a point of thought to seek proper treatment and enjoy parenthood.

Keywords: Infertility, Germline Gene Therapy, Islamic and Medical solution, Amelioration of Embryonic, Infertility in Islam

Introduction

Almighty has blessed man with all the leisure's of life in the form of his blessings one of which bestowment is having offspring. Progeny is the natural desire of human being. Being infertile develops the sense of incompleteness and could confine men social interactions. It not only disturbs the human mind but also damage a couple's relationship. Social, economic, medical and demographic affects are also related to this major public health problem named as human infertility. This is in Allah's hands to bless a couple with His this divine blessing or may deprive them off from this. Having child is that beautiful dream for which man is ready to do every struggle to make it happen true. While discussing the sexual and reproductive health noting all the facts and figures regarding maternal mortality and factors leading towards couple's fertility it becomes necessary to discuss infertility in detail and conceptualizing this phenomenon from perspective of religion. Moreover it is essential to have a look on basic experiences of infertility. In this article we will do scrutiny research on definitions of infertility and its determinants. This chapter will also highlight infertility experiences of male partners in general to highlight that infertility is not solely related to women partners.

1.1. Defining infertility:

Deposition shows that average of 84% of woman get pregnant within one year after having unprotected sex which rises to 90 – 93% within two to three years.[1]

This is the natural human fertility but alteration from this natural path falls into the category of infertility. Infertility can be interchanged with the terms "sterility, subfertility and sub fecundity."

1.1.1. An introduction to definition

Anthropology or study of population density shows the characteristics of human populations and discuss the enough history about the various fertility behaviors and patterns.

Anthropologists are usually interested in birth distribution across the population and use "sterility" as term to define population that has not conceived after marriage.[2]

The total rate of fertility is associated with the number of live births experienced by women through their lifetime.

Various terms are developed by demographers for the detailed description of various fertility phenomenon. The term "fecundity" is described as capability of individual to achieve life birth. This term is not much used out of the demography but the terms having roots in main stream of anthropology are "infertility and sterility".

[1] ER Velde , R Eijkemans and HD Habbema, "Variation in couple fecundity and time to pregnancy: an essential concept in human reproduction," *Lancet* 355,no.9219(2000):1928-1929, 10.1016/s0140-6736(00)02320-5.
[2]Henri Leridon, "Studies of fertility and fecundity: comparative approaches from demography and epidemiology," *Journal of life sciences* 330 no. 4(2007): 339, 10.1016/j.crvi.2007.02.013.

To discuss infertility one must know about voluntary and involuntary infertility. The inability to have a child becomes a problem when the desired outcome is wanting. Discrimination between both is quite difficult because a woman experience both kinds of infertilities during her life span.

From clinical point of view, number of couples seeking help in conceiving fall under the criteria of infertility. Clinical definitions are characterized by "length of span containing unsuccessful conceiving attempts and give a verge above which it becomes necessary to seek a medical treatment. Perpetually conception is interest of outcome rather than birth. Classical definition is inability to conceive within period of 12 months.[3]Whereas WHO promoted this span to 24 months.[4]

It is requirement of all definitions that during this non-conception phase, regular sexual intercourse is taking place without safety diaphragm.

Epidemiologists are concerned with scope, pervasiveness and probe of determinants and risk factors. Exact definition of infertility is needed that removes the false ones. "Unresolved infertility" is a term that meets this criterion.

It is inability to give a live birth and is measured at the last of women's menopausal years.

TTP (time to pregnancy) is another measure of infertility used in epidemiologists and is defined *as number of months that a couple take to conceive after having unprotected sex.*[5] This term was first used by demographers in 1920's and its use increased during late 1980's. When commonly used evaluate life styles, occupational vulnerability or threats to fertility.[6]

To conduct studies of this kind are eventually impractical therefore, it can be analyzed through reminiscence autonomy. TTP can be used as an inductor estimating interval between marriage and first birth. It can be used as continuous measure but common approach is to have a close off date to get binate results. 12 months is usually cutoff date but couples may take up to 24 months. Couples taking 12 – 24 months falls under category of "impaired fertility" and couples taking less than this time falls in category of normal fertility.

1.2. Subtypes of infertility

Infertility can be categorized on the basis of problems in males and females partners both or neither. 30% of infertility is attributable because of male and 54% because of female and 25% cases remain unexplained whereas 15% of couples can have more than one cause for their infertility. [7]

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[3] Johannes LH Evers, "Female subfertility," *Lancet* 360,no.9327(2002): 151-154, 10.1016/S0140-6736(02)09417-5.

[4] "Sexual and reproductive health," World health organization, Accessed March 14, 2020, https://www.who.int/reproductivehealth/topics/infertility/definitions/en/.

[5] Mike Joffe , Hilery Fielder, et al, "Use of time to pregnancy in environmental epidemiology and surveillance," *Journal of Public Health* 30, no.2(2008): 178-180, https://doi.org/10.1093/pubmed/fdn005.

[6] Jeans peter Bonde ,Peter Kristensen,et al, "Validity Issues Relating to Time-to-Pregnancy Studies of Fertility," *Epidemiology* 17, no.4(2006): 347-349, 10.1097/01.ede.0000210239.80406.46.

[7] DJ Cahill , PG Wardle, "Management of infertility," *BMJ* 325, no. 7354(2002): 28-32, 10.1136/bmj.325.7354.28.

There are 3 most common causes of sub-fertility.

i. Sperm dysfunction
ii. Ovulation disorders
iii. Tubal factor problems

1.2.1. Sperm dysfunction

It reduces motility or normality of sperm counts for 30% of infertility causes. Semen analyses is most common in such cases.[8]

1.2.2. Ovulation disorder

Ovulatory disorders contribute to 25 – 30% of infertile couples. [9]It can be diagnosed with the help of blood tests. According to WHO, ovulatory disorders are of 3 types.

1) **Hypothalamic Pituitary failure**
   It contributes to 10% of infertility. Excessive exercise can help its diagnosis.
2) **Hypothalamic Pituitary dysfunction**
   It effects 85% of women. PCO's false into this category that account for 70% of ovulatory disorder.
3) **Ovarian failure:**
   It counts around 5% of women.[10]

1.2.3. Tubal factor problems

Tubal factor problems is directly associated with infertility. Now 11 – 30% of infertility is associated with tube factors which is damaged by chlamydia or gonorrhea, pregnancy sepsis or by post-surgery complications.[11]

5% of infertility in women is caused by endometriosis.

Uterine abnormalities are 10 – 15% involved in infertility i.e. fibroids affect up to 30% of women, sperm cervical mucus affects 9 – 15% of infertile couples.[12]

[8] ibid
[9] Samuel Smith, John A Collins, et al, "Diagnosis and Management of Female Infertility," *JAMA* 290,no.13(2003): 1767, https://pubmed.ncbi.nlm.nih.gov/14519712/.
[10] Diana Hamilton Fairley, Alison Taylor, "Anovulation," *BMJ* 327(2003): 546-547, 10.1136/bmj.327.7414.546.
[11] Y Khalaf , "Tubal subfertility,"BMJ 327(2003):610, 10.1136/bmj.327.7415.610.
[12] Roger Hart, "Unexplained infertility, endometriosis, and fibroids," *BMJ* 327(2003): 721-722, 10.1136/bmj.327.7417.721.

1.3. Determinants of infertility

There are various factors that affect male and female infertility. These factors include age, weight, smoking, sexual history and alcohol etc.[13]

1.3.1. Sexual History

Possible cause of couples infertility is genital tract infections as in women fallopian tubes are exposed to damage and it leads to tubal infertility. STD's also contribute towards the damage of these tubes. Engaging in sexual intercourse with more than one partners can increase the infertility chances in later life.[14]

1.3.2. Age

Age can be seen as factor affecting both male and female fertility. Increasing age of woman lead towards the decline in number of eggs. In mid-30's, follicle loss becomes speedy leading towards miscarriage making conception more difficult.

ART's and different fertility treatments that guarantee conception are creating myth as increased age can cause miscarriage, ectopic pregnancy, multiple births and chromosomal abnormalities.[15] Similarly male sexual dysfunction is associated with the age which starts in mid40's. At this point sperm lose their morphology and motility.[16]

1.3.3. Weight

Being under weight or over weight can affect normal ovulation. BMI is associated with conception. Inconsistent BMI leads toward menstrual abnormalities and metabolic disturbance.[17]

In males obesity can directly affect sperms or can cause hormonal changes that lead towards infertility.[18]

1.3.4. Alcohol

Consumption of alcohol and association between infertility is inconsistent. Alcohol intake lower the level of testosterone which causes problems like erectile dysfunction and low sperm production. Liver disease as result of alcohol also contribute towards infertility.[19]

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[13] "Male infertility," Mayo clinic, Accessed June 14,2020, https://www.mayoclinic.org/diseases-conditions/male-infertility/symptoms-causes/syc-20374773

[14] DB Dunson, CD Baird and B Colombo, "Increased infertility with age in men and women," *Journal of Obstetrics Gynecology* 103,no.1(2004): 51-56, 10.1097/01.aog.0000100153.24061.45 .

[15] Nybo Andersen, J Wohlfahrt, "Maternal age and fetal loss: population based register linkage study," *BMJ* 320, no.7251 (2000): 08-12, 10.1136/bmj.320.7251.1708.

[16]B Eskenazi, AJ Wyrobek,et al, "The association of age and semen quality in healthy men," *Human Reproduction* 18,no.2(2003): 447-452, 10.1093/humrep/deg107.

[17] ibid

[18] RHN Nguyen, AJ Wilcox,et al, "Men's body mass index and infertility," *Human Reproduction* 22,no.9(2007): 2488, 10.1093/humrep/dem139.

Alcohol consumption in women disturbs the menstrual cycle and cause endometriosis.

1.3.5. Smoking

Cigarette smoke has negative impact on each system involved in female reproductive process as it can result in premature egg depletion and age's women ovary.[20]

Smoking in man decreases the density of sperm and reduce the success rate of ART's.[21]

1.3.6. Drug Use

Steroids that men take for muscle strengthening cause testicles to shrink and decrease sperm production.[22]

Use of cocaine and marijuana decreases sperm density and motility.

1.3.7. Stress and depression

Psychological stress and hormones needed to regulate sperm parameters. Prolonged emotional stress may affect sperm count. Similarly depression causes inhibited ejaculation and erectile dysfunction.[23] Increase stress in woman cause hormonal imbalance, delayed menstrual cycle and healthy oocytes production.[24]

1.3.8. Environmental causes

Female fertility is very less affected by outer factors as compared to male fertility. These factors include lead exposure, radiations, organic solvents, pesticides and heat exposure.

Normal testicular function is performed between 2 – 4°C as more than this temperature affects semen quality. It is created by hot baths, tight clothes and laptop etc.[25]

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[19] AC Martini, RI Molina RI, "Effects of alcohol and cigarette consumption on human seminal quality," *International journal of andrology* 46, no.2 (2012): 115-117, https://doi.org/10.1111/and.12054.

[20] SR Soares, MA Melo, "Cigarette smoking and reproductive function," *Journal of Obstetrics and Gynecology* 20, no. 3(2008): 281-91, 0.1097/GCO.0b013e3282fc9c1e.

[21] ibid

[22] MB Bracken, K Sachse, "Association of cocaine use with sperm concentration, motility, and morphology," *Journal of fertility and sterility* 53, no.2(1990): 315-317, 10.1016/s0015-0282(16)53288-9.

[23] B Zorn, J Auger, "Psychological factors in male partners of infertile couples: relationship with semen quality and early miscarriage," *International Journal of Andrology* 31, no.6 (2008):57-64, 10.1111/j.1365-2605.2007.00806.x.

[24] Honor whiteman, " Stress linked to male infertility," *Medical news today*, May 30, 2014, https://www.medicalnewstoday.com/articles/277543 (Accessed May 3, 2020)

[25] Kavindra Kumar Kesari , Ashok Agarwal, Ralf Henkel, " Radiations and male fertility," *Journal of Reproductive biology and Endocrinology* 16, no.18(2018):8-9, https://rbej.biomedcentral.com/articles/10.1186/s12958-018-0431-1.

1.4. Infertility and Reproduction

Infertility leads to adverse reproductive outcomes such as fetal death, preterm birth or low birth weight and chromosomal defects.

Adverse reproductive outcomes are necessary to define in order to discuss their relationship with infertility.

1.4.1. TOP (Termination of Pregnancy)

It is the act of ending a pregnancy intentionally because of medicine or surgery. It is also termed as induced abortion or therapeutic one. TOP is done in case of unplanned or unwanted conception.[26]

1.4.2. Miscarriage

It is termed as fetus death at a defined point in early pregnancy. 8/10 miscarriages happen in first 3 months of pregnancy. That's why it is termed as spontaneous abortion.[27]

1.4.3. Still birth

Death of infant after surviving for 28 weeks in the womb. It refers to chromosomal disorder, blood pressure maternal diabetes and post –date pregnancy (a pregnancy that lasts for more than 42 weeks).

1.4.4. Ectopic pregnancy

Here implantation occurs inside the uterus or in fallopian tubes. This pregnancy lead towards the removal of one of the fallopian tubes. It is more common in patients with STD's. Or in people older than 35 years or in couples undergoing fertility drugs.[28]

1.5. Male Infertility

Male outlook of infertility has been published by different research regimens. Keylor and Apfel stated that even male infertility affect half of the infertile couples but such factor is neglected in the research.

Research on male infertility is mostly issued by psychology and infertile man's outlook of pain and distress are findings of research.

There are three factors that could help in detecting male infertility.

i. Low sperm production (Oligozoospermia)
ii. Poor sperm motility (asthenozoospermia)
iii. Abnormal sperm morphology (atzoospermia)

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[26] P Shah, J Zao, "Induced termination of pregnancy and low birthweight and preterm birth: a systematic review and meta-analyses," *BJOG* 16, no. 11(2009):15-17, https://obgyn.onlinelibrary.wiley.com/doi/pdf/10.1111/j.1471-0528.2009.02278.x.

[27] "Marriage," Meddline plus, Accessed August 25, 2020, https://medlineplus.gov/ency/article/001488.htm

[28] "Ectopic pregnancy," Planned parent-hood, Accessed August 5, 2020, https://www.plannedparenthood.org/learn/pregnancy/ectopic-pregnancy.

Common cause of infertility in males is combination of all three. (COAT)

Main causes of infertility could be varicocele, varicose veins around testicles, too few sperms, some sort of injury to reproductive system, psychological factors or some other diseases.[29]

The study about male infertility disclosed four concepts;

1) Individual stress
2) Challenges in communication
3) Problems associated with therapy process
4) Effect of norms and religious behavior

The strong trust in reproduction for family strengthening as well as societal and cultural norms effects men infertility experiences within themselves and their spouses too.

1.5.1. Male infertility experience

Mostly infertility is accused for women that's why men's emotional reactions are not explored.

When it comes to infertility, men's ability to become father, and reproduction of family tree are major factors behind emotional reactions. 15 -20% of men state infertility as one of the most difficult issue of life. Infertile men's minds are filled with thoughts of depression and suicide as compared to the men who do not have infertility issues.

More than 15% needs professional help to deal with their emotional issues. Men's infertility is mostly considered shameful and women protect men by taking blame to themselves.

Men feel mere pain and stress when they used to talk about their infertility.

For being a real man, bearing child has become an ability and criteria that's why men with infertility issues consider themselves as they have failed to play their role as man and their identity has been undermined.

Men and women experience infertility in a distinct way but when it comes to emotional reactions, they are not that much different. The difference is in the expression of that emotions. Women speak up about their sadness while men gets bury themselves in work and use it as a tool to forget painful issues of their lives.

As men's style is avoidness and withdrawal hence they feel more distressed than women. Their anxiety rises after failed ART's. They get stronger feelings of injustice as they think of themselves more responsible for couple's infertility.

Almost all the study on male infertility shows that men feel more worried about the way their partner react towards infertility. They also feel worried about this that how this pain and sorrow affect their marital relationship.[30]

[29] "Infertlity overview," Mayo clinic, Accessed My 11,2020, https://www.mayoclinic.org/diseases-conditions/infertility/symptoms-causes/syc-20354317.

1.6. Infertility in the Light of Quran and Hadith

The concept of infertility can be understood by the appealing story of Hazrat Ibrahim (AS) and Hazrat Sarah that has been mentioned in the Holy Quran. He and his wife Sarah remained infertile for several years and then Allah Almighty blessed them with progeny. Here comes in Quran: *Gave him good news of a learned boy and his wife approached with a cry and struck her face and said I am a barren old women. Angles said; this has said your Lord and Indeed He is the wise and All Knowing.* [31]

Quran has mentioned the story of Zakariya (AS) who remained faithful and supportive to his infertile wife. Quran mentions as: *And mention Zakariya when he asked his Lord; My Lord! Don't leave me alone [without offspring] though you are the best of inheritors so, we responded to him and him Yahya (AS). We amended his wife from barrenness Indeed they called us in hope and fear and they were humbly submissive to us* [32]

On handling infertility issue there are two very important sayings of Prophet (SAAW).[33] *Marry the one who is fertile and loving for I will boast of your great numbers.* And he said: *There is no disease Allah has created without its treatment.* [34]

1.7. Conclusion:

Infertility is a phenomenon that not only gives tough time to females but it equally affects male partners. Due to the quiet nature of males and communication gap with female partners they tend to hide their feelings of being incomplete and being not sharing these things could develop thoughts of suicide and can drag them to endless emotions of depression. The religious studies give lessen not to leave hope in such situations and have complete faith that there is always a cure present for ailment could show positive results. So by taking care of health and advice of endocrinologists one may get the desired outcomes. Assisted reproductive techniques could prove a ray of light to such couples.

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30 Paul Gallagher, "Male infertility:The pain does not fade with time-it intensifies," *I news Uk*, August 7, 2017, https://inews.co.uk/news/health/male-infertility-pain-not-fade-time-intensifies-83350 (Accessed July 16,20200.

[31] Al-Zuriyat:28-30

[32] AL-Anbiya:89-90

[33]Abu Dawood Suleman bin Aash'as Al-Sajastani, *Sunan Abi- Dawood* (Beirut: Maktba Al-Asriya, N.d), Book of Nikah, Chapter 670: Prohibtion of marrying a woman who cann't give bith, vol.2, Hadith No: 2050.

33

Muhammad bin Ismail Bukhari, *Al-Jamaih Al- Sahih* (Beirut: Dar toq wal nijah,1422), Book of diseases, [34] Chapter 1: There is no disease except its treatment, vol.7, Hadith No: 5678.

1.8. Germline Gene Therapy

Due to advancement in stream of knowledge, science has become successful in getting the ways to treat several hereditary disorders. Male infertility is the focus here, now the issue is that sub fertile men have missing Y-chromosome, which effects the number of sperms and passes the infertility to the off springs. ICSI born child are affected by abnormal structure of chromosome and increased sex chromosome disorders. The birth defect rate is more in ICSI born child and the formation of embryo is abnormal due to which the embryo does not implant in the womb and fail to grow, which lead to miscarriage. Chromosomal defects can be cured by Germline Gene Therapy**.**

Introduction of genes into reproductive cells (i.e. egg or sperm) in order to treat the inherited genetic defects. It is a type of gene therapy where new DNA is injected into the cells using vector i.e. virus. New DNA replaces faulty DNA to cure genetic disorders.[35]

1.8.1. Steps of Gremlin Therapy

At any nonspecific point totipotent is taken out of the reproductive tubes [cells of embryo are totipotent form the very initial till four days after conception.

Genetic Locality of Embryo

Simplest way to avoid abnormality is to destroy the defective gene and left healthy gene working.

Every Human has a pair of Chromosomes one from father and one from mother. So gene is present on two locus. Presence of gene on each loci is called allele which are dominant and recessive. Dominant show their characters on one locus while recessive show its characters on both. If the allele is same than it is called homozygous while if it is different it is termed as heterozygous which produce the infected off-springs[36]

A+B+C+

×

A-B-C-

A+ B-C-

A-B+C+

Amelioration of Embryonic Stem Cells

In specific culture, living time of karyotype is very less specifically when X chromosome gets destroyed during in vitro than male embryo will cure. [37]

Induction of DNA into Embryonic Cells

[35] H.T. Greely, "*Germaline gene therapy*," Encyclopedia of applied ethics, 2nd ed. (Science direct, 2012).

[36] Genetics home reference, "What is a gene mutation and how do mutations occur?," Accessed July 13, 2020, https://ghr.nlm.nih.gov/primer/mutationsanddisorders/genemutation.

[37] JA Thomson, *Isolation of a primate embryonic stem cell line* (USA: PNAS, 1995), 784.

As a particular genetic combination needs around 1 lac cells that's why transfection (nucleic acids-eukaryotic) is used. Accessible ways have limited outcomes and they also destroy some outcomes and they also destroy some target cells.

Acceptation of Induced Gene by Cells

They are one in 10,000 such gene is linked with transfected DNA which defend the cells from disastrous medicines. The cells that have accepted transfected DNA shows the defensive gene as well.

Exchange of Particular Gene

It is true genetic cure in which the disarrangement of DNA are organized at their place and hence they start their work effectively.

Marker Removal

When a particular gene is inserted into target cells it is always having some genes at its sides in order to mark its induction. It is necessary to remove those side genes in order to prevent undesired activity.

Conformity of Genomic Integrity

It is quite possible that after induction, during cell by cell division genomic integrity might get lost so, it is necessary to confirm its integrity before the transfer of embryo into the womb.

Nuclear Transfer

Various chemicals are used to produce more than one egg. Nucleus is removed from a non-germinated egg and replaced with other nucleus. By such process, an embryo with changed DNA will be formed.

Re-implantation

Out of every 100 embryos formed by such process, 98 gets destroyed. Remaining gets destroyed after conception. Only 13% of people practicing in vitro gets successful.[38]

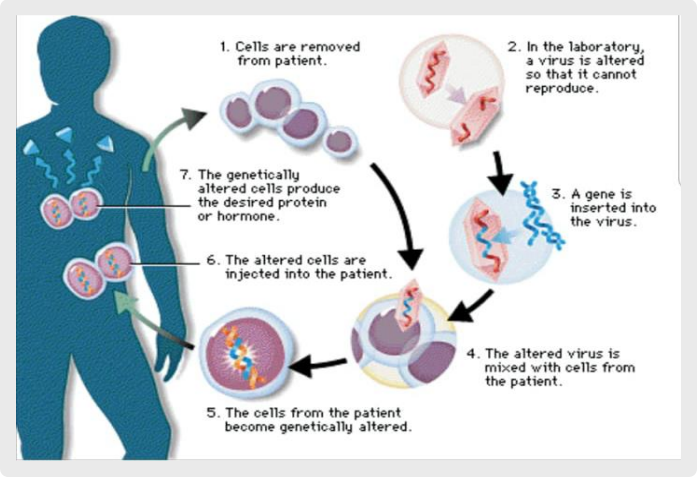

Figure 2

[38] Elisia D. Tichy, "Mechanisms maintaining genomic integrity in embryonic stem cells and induced pluripotent stem cells," *Journal of Bio-medical* 236, no.9 (2011): 990-991, https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4077782/.

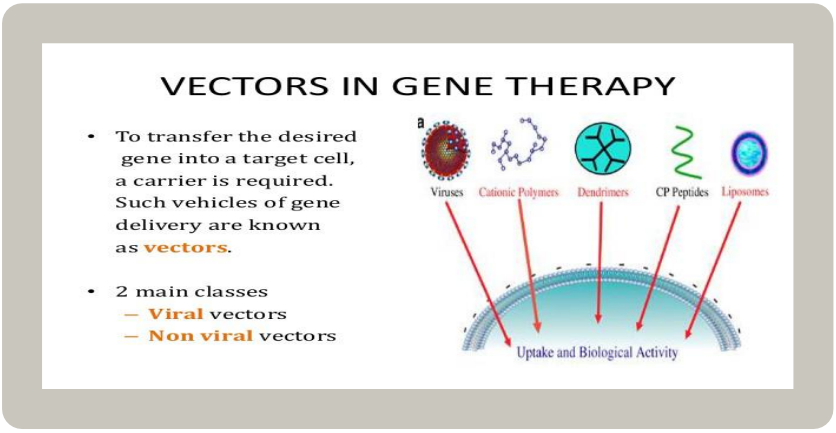

Figure 3

1.8.2. Pros and Cons of Germ Theropy

- It is helpful in treatment of genealogical disorders.
- It can also be used to cure the defects in unborn.
- This method has reduced the abortion rate.[39]
- Death rate of offspring's has been controlled through this process.
- It can cause infections in new generation as by use of vector it can cause disorders and lead to various other fatal infections. [40]

1.8.3. Conformations to Treat with Germ Therapy

Some of the assets are due to urgent needs while others are in desired category. Scholars have made some of the forms licit and called other modes illegitimate. Before describing the legality of cure it is necessary to mention those ways in which gremlin therapy is used as treatment.

- Internal modification of germ cell.
- Escalation and diversification
- Invulnerability solutions
- Infatuation aspect
- Offspring's predilection

1.8.3.1. Internal modification of Germ Cell

This ways of treatment is permissible near contemporary scholars. They have considered it as dialectic of the treatment of organs as treatment of organs is lawful for the safety of life in the some way internal modification of germ cell is authorized for the security of pedigree. [41] Scholars have made it legitimate on basis of few reasons:

1. It gives assurity to get rid of inherited diseases.
2. It does not even lead to the fusion of genealogy.

[39] Misbah Abdul Hadi, *Al-ilaj ul jeeni wa istanakhul Azaa-ul Bashri* (Cairo: Dar- Misriya, 1999), 207.
[40] Dr Arif Ali, *Faqih Fil-Bashariya Min Manzoor Islami* (Oman, Dar-ul-Nafas, 2001), 749.
[41] Misbah Abdui Hadi, *Al-ilaj ul jeeni wa istanakhul Azaa-ul Bashri,* 63.

However some scholars have not allowed it on basis of its detriments[42]. There are chances to catch up diseases by cell transfer which is similar to assassinate yourself and the child as well and anything which cause damage to humans is non-admissible.[43]

2. Is a Fiqh dictum, which made it non-permissible as it is having apprehension of loss and fear? [44]

3. It is illegitimate to enter anything in human body until you have assurance of no loss.

1.8.3.2. Use of germ cell for escalation & diversification

It is mandatory to discuss the main origin from where this germ cell is educing. For generic treatments cell is obtained through following ways:

1. Wife's own egg/cell
2. Husbands cell/sperm
3. Husband's second wife's cell/egg
4. Unknown's egg/sperm

Imperatives about usage of Wife's Cell

Its decree is similar of treatment with somatic cell therapy as by its use ancestral specifications are passed on to next generation which are of no danger. [45]

Imperative about usage of Husband's cell

Healthy genes from the reproductive cell are induced into another zygote.

There are two affinities in such process. One is with somatic cell therapy which is concord admissible so, in this cure, use of husband reproductive cell will also be allowed. Other similarity is with test tube baby, in which reproductive cell is artificially inseminated.[46]

There is differences of opinion in this procedure near contemporary scholars.

Proposer's Evidences

As sperm and egg hare characteristics of husband and wife and many of these characters are used to treat generic diseases hence no strange element is involved, that's why it is lawful. [47]

Adversary Evidences

There are several afflictions in this process, one of which is genealogical fusion (اختلاطِ نسب) which is adjacent to sharī'ah.

This way of treatment is necessary, as by advancement of technology it is quite possible to test the sperm cell before inducing then to mother's womb.[48]

Usage of Second Wife's Cell

Its decree is similar to the usage of husband's reproductive cell. There are two similarities in it.

- Similarity with somatic cell.

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[42] Al- Baqarah : 118

[43] Shah bud din Aloosi, *Rooh-ul-Maani (Beirut: Dar-ul-Kotob Ilmiya, 1415), 118.*

[44] Zain ud din Ibrahin Al-Nujaim, *AL'Ashabah wal Nazair (Beirut: Dar-ul-Kotob Ilmiya, 1999), 72*.

[45] Abul Nasir Abul Basal, *Al- Hindsatul Janayat Al -Warisiya Al-Manzor ul Sharai'I* (Oman: Darul nafas, 2001), 706.

[46] Ibid. 708.

[47] Ibid. 707.

[48] Eyad Ahmad Ibrahim, *Al- Hindsatul Warisiya Bain Mutiyatul Ilm Wazawabit ul Shara'ah* (Kuwait: Darul Fateh Al Dirasat, N.d), 97-98.

- Similarity with artificial insemination.

This method is dialectic of surrogate mother. This is non-permissible near proletarian (جمہور) scholars. Whereas some scholars have called it legit.

There is some difference in this way of treatment. Egg which is used in surrogate mother is not re- fixed at its original place but placed in second women's womb.

Whereas in this way of treatment egg is re-induced at its origin.

In surrogacy, egg and womb belongs to two different women so, the child will carry the characters of surrogate mother. Whereas in the given situation gene from a healthy women is induced into the infected egg so the child will be able to carry the characteristics of both. Reason of illegality is as it leads to fusion of genealogy and also to the change of DNA which is blend of the characters of both wives.[49]

Use of Unknown Cell:

This process is concordly inviolable/illegitimate "*Haram*" in all its forms. Affinity with genealogy is prohibited in this verse of Quran[50]. It shows that a child can only be alliance with his father. As this method causes fusion of pedigree that's why it is termed as prohibited.[51] Prohibition of fusion is proved by the saying of prophet (SAW), as the treatment is supposed to safe the pedigree and generation which actually gets diminish by this form that's why this method is illicit. [52]

1.8.3.3. Offspring's Predilection

Zygote is examined after pregnancy to know about its gender. If it is male and mother is sick due to which there are chances of embryo to catch up diseases than specific cells are selected in order to prevent the disease and vice versa.

There are three opinions of scholars in this respect:

1. This is allowed on basis of necessity and exigency.
2. This is not accurate as it is intrusion in Allah's regulation.
3. This is admissible only if it is between husband and wife. [53]

Proposer's Arguments: They have made this verse of Holy Quran as inference[54]. In this verse, Allah's prophet has prayed for definite gender and Prophet's do not pray for illicit. Hence which is allowed to pray, it is also permissible to act for that. Reason of preference is because of the fact it eliminates the harms and sufferings from Ummah. It has no doubt of pedigree fusion.[55]

Opponent's Reasons: They have made this verse[56] as base. Division of gender is according to Allah's will and wisdom. Selection of gender is similar of interference in Allah's will due to alteration in Allah's original work/creation, this process is not accurate.

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[49] Dr Muhammad Ali Al-Bar, "Al- Talqeh-ul-Sanai wal Itfal ," *Mujallah Al-Fiqh-Ul-Islami* 2, no.1 (1986): 170.

[50] Al- Ahzab: 33

[51] Abdullah Basam, "Itfal-ul-Anabeb," *Mujallah Al-Fiqh-ul-Islmai* 2, no.1 (1986): 261.

[52] Abdullah Basam, "Itfal-ul-Anabeb,", 253.

[53] Muhammad Usman Shabbir, *Muaqif-ul Islam Min-al-Amraz-ul-Warisiya*(Oman: Dar-ul-Nfais, 2001), 239.

[54] Marium: 05

[55] Dr Yousaf Qardawi, *Fatwafa Muasira* (Beirut: Maktaba Islami, 2000), 546.

[56] Al-Shoora: 49

3.6.3.4. Invulnerability Solutions

There is no defect in the germ cell but to keep in mind the safety of cell you want its treatment, it is not admissible as there is no ground of this treatment. Germ cell is medicated in order to increase the immunity against virus. This could be done by this method:

In the early stages of egg, gene is induced into it outside the mother's womb so that it may get protected.

3.6.3.5. Infatuation Aspects

Additional characteristics are supposed to attain by this method rather than using it as a cure like skin tone & intellect etc. Scholars have made it unlawful as per intrusion in creation of Allah.

1.8.4. Medical Imperatives of Germ Therapy

Within less than two decades, it has made pace from laboratory research to clinical translational trials for variety of deadly diseases. Most notable are: (ADA-SCID), (CGD), Hemophilia, cancer, neurodegenerative disease. HIV, hepatitis, congenital blindness, lysosomal, storage disease and muscular dystrophy.

In severe combined immune deficiency, children are born without an effective immune system. For this deadly genetic disorder, cure was conducted in Italy. Gene was introduced into bone marrow, followed by genetically corrected cells. All six patients are having normal lives without further treatment.

Hemophiliacs are not able to induce blood clots. Trials conducted in US, therapeutic gene was introduced into the liver, who then start having ability of blood clothing.

Is it really needed?

- It would never have been effective enough to rule out the need for post fertilization screening of embryos.
- It introduces additional risks to embryo compared with IVF and screening for healthy embryos before implantation.

Countries allowing germ therapy besides Italy & USA is China who is doing dicey experiment to edit human embryos.

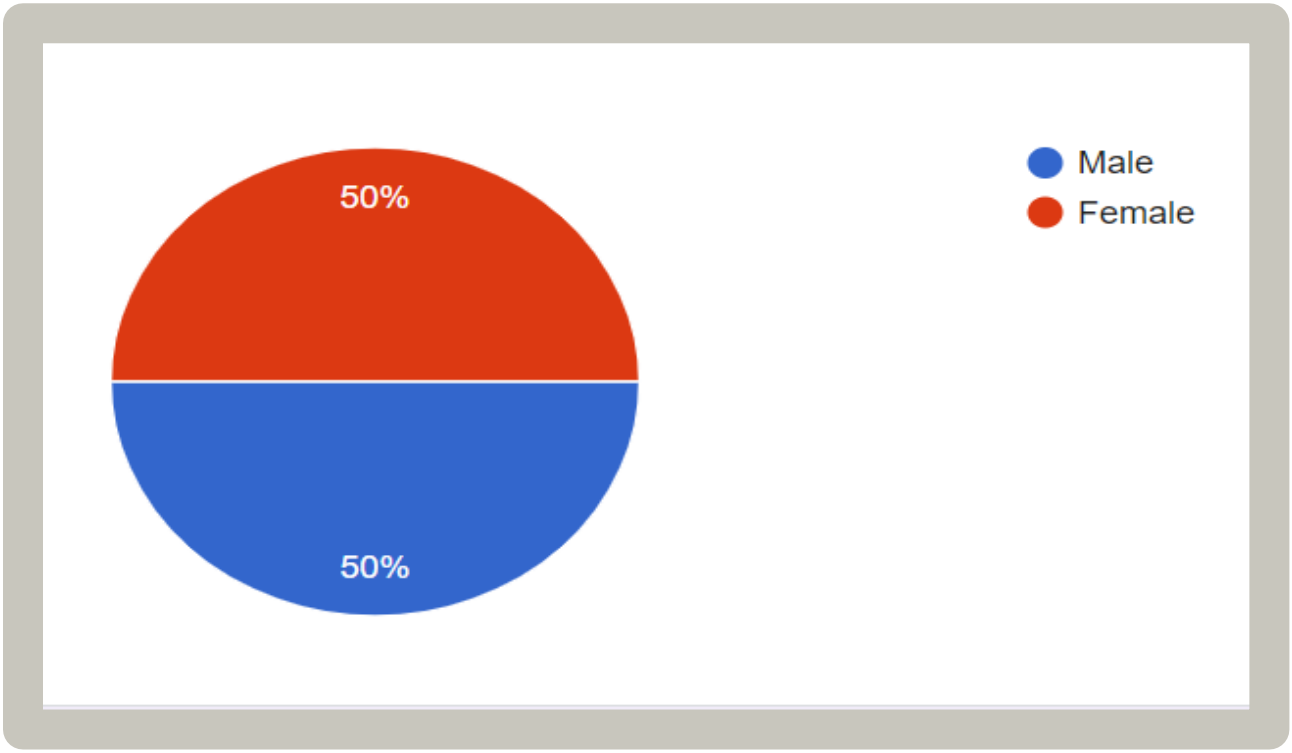
1.9. Result Analysis

To have offspring's is among the utmost desire of human beings. Quran declared wealth and children as worldly attractiveness.[57] Infertility is acknowledged as remarkable deprivation. Quran has not only stressed upon praying for such hardships but asked men to seek help by all legitimate means to cure their complications. An interview has been conducted to know about the lived experiences of medical specialists about their male infertile patients.

The results of the interview are as follows:

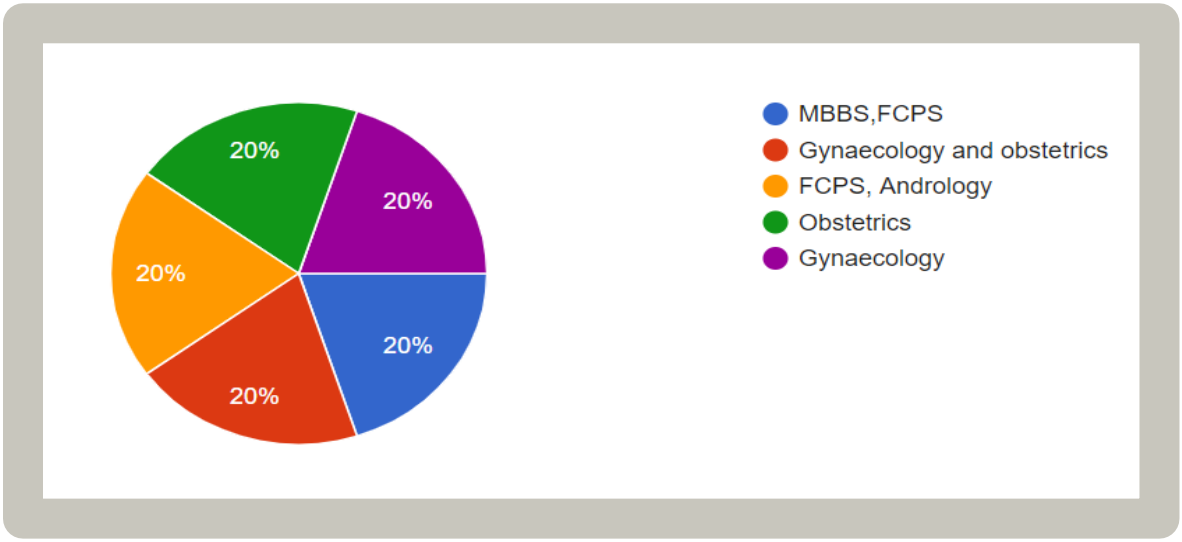
Q: 1. Choose your gender

[57] Al-Imran:14



The respondents of the study involve the medical specialists out of which 50% were male and remaining 50 % were female respondents.

Q: 2.Choose your grade



20% medical specialists were obstetrics which include 2 male doctors. 20% respondents were gynecologists that involved 2 female specialists. 20% respondent s were related FCPS, andrology that include 2 male

specialists. 20% respondents that were related to MBBS, FCPS include 1 male and 1 female specialists. 20% respondents of the study were gynecologists and obstetrics which include two female specialists.

Q: 3.What percentage of male patients accept their infertility and pay proper heed to their treatment?

Three male and one female respondents believe that less then10% male patients accept their infertility issues. Three females and one male respondents believe that less than 10% pay proper attention to their infertility. One male respondent and one female respondent of the research believe than less than 30% and 50% male patients are aware of being infertile and look for their treatment.

Q: 4.How do male patients behave being infertile/what impacts infertility has on them?

Male patients suffering from infertility remain in complete denial phase. They also don't accept being infertile and don't become ready for their semen analysis. Moreover they start behaving even harsh to their wives and end up being psychologically disturbed.

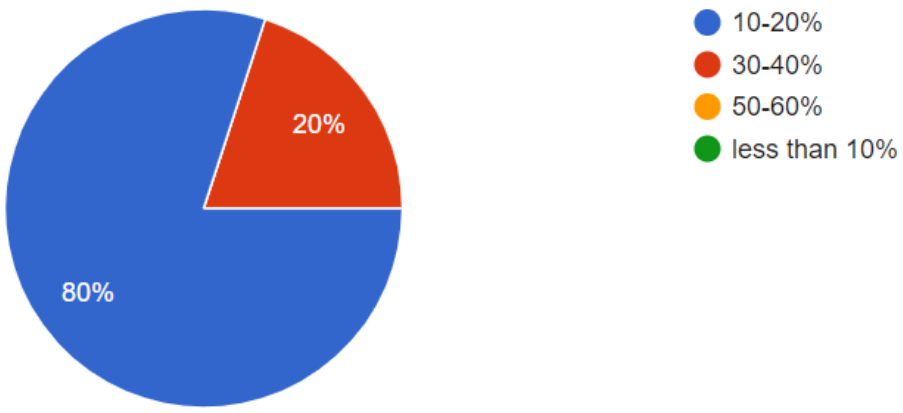
Q: 5. Do you believe that sperm injections are best cure to infertile males?

All the study respondents believe that sperm injections are the best of treating male infertility but the success of this procedure depends on medical conditions of couples, sperm count and morphology of sperms.

Q: 6.As infertility passes from infertile father to son, how do you tell your patients that it is also the disease that can possibly be cured by Germaline gene therapy?

Respondents of the study believe that Y chromosome is responsible of passing hereditary traits hence infertility can be passed on from father to son in infertile males as it is a genetic defect and all such defects are curable by Germaline gene therapy.

Q: 7. How many infertile couples have some knowledge about reproductive techniques?



80% respondents of the study believe that only 10-20% couples have some knowledge about reproductive techniques which involve three male and five female specialists. 20% specialists believe that only 30-40% couples are aware of procedures that include one male and one female doctors respectively.

Q: 8. Do your patients prefer inquiring about the legality of reproductive techniques? If no opt for your reasons.

30% specialists ask their patients to inquire about the legality of infertility procedures that involve one male and two female specialists. 40% respondents believe that asking about legality is worthless as couple only have concerns about conceiving a child by any means which involve two male and two female specialists. 30% respondents shared that having a baby is above all so, legality doesn't even matter for parents. It includes the opinion of one male and two female specialists.

1.10. Conclusion and Recommendations:

Infertility without a doubt is among the issue that is reversible and can be cured by proper medication and various reproductive technologies. The research conducted in order to inquire about the cures of male infertility shows that male patients feel ashamed while being infertile. This thing makes them psychologically ill and they put themselves at distance from society. They not only feel reluctant being examined but also make excuses to avoid treatments.

Asia is among the regions of the world where all the focus of infertility treatments is more inclined towards women rather on men.[58] As there is dominance of male gender so the issue of male infertility remains unattended. Male patients therefore on being termed infertile remain in complete denial phase. They start taking infertility as a symbol of shame for themselves and behave accusing women as the cause of childlessness.[59]

No doubt the absence of fatherhood lead to the severe psychological traumas as female specialists feel reluctant while talking to male patients. So, it is the utmost responsibility of medical specialists:

- To make infertile couples aware about causes of infertility that infertility could be because of any of the partner so both are necessary to examine instead of blaming each other.
- To make them feel it is not justice to make women suffer because of male health problem.
- Female medical specialists must also focus on male infertility factors by avoiding the phenomenon of reluctance.
- To help couples understand that both genders have same emotional impact of absent parenthood.
- Provide counselling and therapies to men so that they could be able to express their emotions
- To help male patients enough so that they don't put themselves at side and stop feeling hesitant while sharing their medical issues.
- Make them educate about the fact that being infertile is not a shame but a point of thought to seek proper treatment and enjoy parenthood.
- To make male patients confident enough by counselling so that they start taking infertility as an ailment and show positive attitudes for its treatment.
- To educate people that all the reproductive procedures can be used with all the legalities within the confined boundaries of Sharīʿah.

Hence it becomes clear that infertility is that major concern of the society that needs proper attention. Society needs to understand that infertility when subjected to women becomes abuse and males could equally be a cause of this incompleteness. It is also the duty of health sectors to make proper intervention for infertility in order to release the social, psychological and physical burden from the society. No doubt medical advancement has bring forth various legal issues and opened door to several evil consequences,

[58] Jane RW Fisher and Kasin Hammerberg, "Psychology and social aspects of infertility in men: an overview of the evidence and implications for psychologically informed clinical care and further research," *AJA* 14,no.1(2012): 121, 10.1038/aja.2011.72.

[59] Neelofar Sami and Tazeen Saeed Ali, "Psycho social consequences of secondary infertility," *JJPMA* 56, no.1(2006): 20, https://ecommons.aku.edu/pakistan_fhs_mc_chs_chs/276/.

where it is a ray of light to infertile couples there we are also supposed to look into its vitiations and detriments.

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