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An Analysis of Factors Associated with Female Infertility

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Abstract: *The incapacity of a couple to conceive, despite two or more years of unprotected sexual intercourse, is the general definition of infertility. It impacts approximately 60 million to 168 million individuals and 13% to 15% of couples worldwide. A search was conducted in the MEDLINE, Scopus, EMBASE, PUBMED, and Science Direct databases for this investigation. The comprehensive review examined thirty-one research articles. The objective of the current investigation was to conduct a comprehensive literature review in order to identify the risk factors associated with female infertility. Smoking, obesity, alcohol consumption, advanced maternal age, sexually transmitted infections, ovarian factors, tubal and peritoneal factors, hormonal disorders, genetic factors, lifestyle, and many other factors are among the risk factors for infertility. The causes of infertility have been associated with a variety of factors. The likelihood of women experiencing fertility can be enhanced through lifestyle modifications, the identification and management of chronic diseases, and the provision of rapid and appropriate treatments for sexually transmitted diseases. This research article is advantageous and advantageous to all medical and scientific researchers who are interested in eliminating infertility.*

Keywords: Female Infertility, Polycystic Ovary Syndrome (PCOS)

I. INTRODUCTION

One of the most critical biological functions of all life forms is reproduction. For the majority of couples, the desire to have children is a fundamental necessity, and the inability to do so is regarded as catastrophic. The incapacity of a couple to conceive, despite two or more years of unprotected sexual intercourse, is the general definition of infertility. The term "primary infertility" refers to couples who have not experienced pregnancy after engaging in sexual activity for a minimum of one year without the use of any contraceptive methods. Secondary infertility is a condition in which couples have been able to conceive at least once but are currently unable to do so. This constrains the relationship between the couples, which ultimately leads to divorces. Despite the fact that the couple is seeking treatment, women are frequently held accountable for their infertility and are expected to undergo diagnostic procedures to determine the root cause. Life changes, including lifestyle changes, physical and emotional changes, and changes in relationships, were experienced by all couples who were undergoing infertility treatment. There was a perceived loss of control over numerous aspects of their existence.

In the past decade, the availability of a wider variety of infertility treatment options has been expanded by advancements in technology and medicine, resulting in a heightened demand for infertility treatment. The World Health Organization estimates that the prevalence of primary infertility in India ranges from 3.9 to 16.8 percent. It impacts approximately 60 million to 168 million individuals and 13% to 15% of couples worldwide. A core group of couples, approximately 3 to 5 percent, are infertile as a result of unpreventable or undocumented conditions. Countries exhibit infertility rates that range from less than 5% to over 30%. The causes and significance of infertility may differ depending on the geographical location and are influenced by socioeconomic, demographic, and anthropometric factors. Infertility is a universal barrier that affects individuals worldwide. Smoking, obesity, alcohol consumption, advanced maternal age, sexually transmitted infections, ovarian factors, tubal and peritoneal factors, hormonal disorders, genetic factors, lifestyle, and many other factors are among the risk factors for infertility. The causes of

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infertility have been associated with a variety of factors. The identification of the burden of infertility in each country is essential for evidence-based decision-making.

Only 5% of infertility cases are caused by endocrine, anatomical, genetic, and immunological issues, leaving approximately 95% of infertility cases susceptible to prevention. These preventable conditions encompass exposure to environmental noxious substances, health services, parasitic diseases, and STDs. The factors that contribute to these conditions are not consistent across all regions. The estimated infertility prevalence and its influencing factors are significantly influenced by the lack of access to primary infertility and the precise methodology used to determine infertile women and the population exposed to the risk of fertility. The initial step in preserving pregnancy power through lifestyle modification is to be aware of infertility. The likelihood of women experiencing fertility can be enhanced through lifestyle modifications, the identification and management of chronic diseases, and the provision of rapid and appropriate treatments for sexually transmitted diseases. A global survey of nearly 17,500 women from 10 countries revealed that there was a lack of knowledge regarding the biology of fertility and reproduction.

By enabling couples to circumvent specific risk factors that may contribute to infertility, an increase in awareness of the risk factors may contribute to a reduction in its prevalence. Various primary and secondary risk factors are examined in this study to examine the causes of female infertility. Female infertility is caused by a variety of factors. Numerous investigations have been conducted to exclude the precise cause of female infertility. This endeavor was undertaken to revise and disseminate information regarding female infertility that could serve as a benchmark for the assessment of female infertility.

II. MATERIALS AND METHODS

This investigation examines several research articles regarding risk factors associated with female infertility. The primary objective of this article is to identify the risk factor that contributes to female infertility. The results of the scientific research article, which were published in a variety of journals, address the primary and secondary infertility factors. Some studies were conducted on the databases of MEDLINE, Scopus, EMBASE, PubMed, and Science Direct. Thirty-one research articles were evaluated with similar subjects to determine the various risk factors that contribute to female infertility.

Results

Smoking, obesity, alcohol consumption, age, sexually transmitted infections, ovarian factors, tubal and peritoneal factors, hormonal disorders, residency, family history, cell phone use, stress, nutrition, unknown factors, and any chronic disease that reduces the likelihood of successful pregnancy are among the major risk factors of female infertility.

Age

The increased risk of infertility may be associated with age. The quality and quantity of women's oocytes are diminishing as they age. After the age of 30, the rate of follicle loss increases, resulting in embryos of inferior quality. This complicates the process of conception and elevates the likelihood of miscarriage.

Endometriosis

Endometriosis is a gynecological disorder that affects menstruating women. It is defined as the ectopic implantation of endometrial tissues and stroma outside the uterine cavity. These endometrial implants may repercussion similarly to the normal endometrium in response to cyclic hormones, which may manifest as pain and hemorrhage. Research indicates that the development of endometriosis may be linked to endocrine disrupting compounds (EDC). Whether there was a correlation between a higher concentration of persistent organochlorine pollutants (POP) in the body and a higher incidence of endometriosis. Endometriosis also appears to impact fertility in indirect manners, such as by causing injury to the sperm or embryo.

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Polycystic ovarian syndrome (PCOS)

PCOS is a prevalent cause of female infertility. High levels of androgens hormone are one of its primary characteristics. In women, the growth, maturation, and discharge of ova during ovulation are disrupted by elevated hormone levels. This can result in the development of cysts, which are sacs that are full with fluid and located in the ovaries. Infertility is a result of high androgen levels, which are associated with fibroids in the ovaries, reduced or absent menstrual periods. Women who have polycystic ovary syndrome (PCOS) are also susceptible to cardiac disease and diabetes. Polycystic ovarian syndrome (PCOS) is a collection of gynecological disorders that are associated with issues with the secretion of specific hormones. These hormones can be responsible for a variety of issues, including obesity, aberrant hair growth on the face or body, and acne. Insulin resistance, irregular menstruation, and the development of ovarian follicles are frequent complications of PCOS. Female sexual function is significantly influenced by natural killer cells. Inductive failures are associated with these cells. Abortion or infertility and gene expression were induced by natural killer cell cytotoxicity.

Primary Ovarian Insufficiency (POI)

Primary ovarian insufficiency (POI) is also referred to as premature ovarian failure. It occurs when a woman's ovaries cease to function ordinarily prior to the age of 40.

This condition is primarily caused by an autoimmune response or the premature loss of eggs from the ovary. The ovary is no longer capable of producing eggs due to the reduced production of estradiol in women under the age of 40. Infertility, thyroid issues, heart disease, and osteoporosis are among the symptoms of POI.

Hormonal disorders

Hormonal disorders are characterized by symptoms such as irregular menstrual cycles, excessive bleeding or very low hemorrhage, pelvic and abdominal pains, absence of menstruation or extended menstruation, and excessive weight loss or weight gain. These conditions may also be referred to as ovulation disorders. Various factors contribute to hormonal disorders, including the thyroid gland, pituitary gland, and hypothalamus gland. The synthesis of reproductive hormones is the responsibility of these glands. These glands are influenced by stress, hypothyroidism, and birth control medications.

Fallopian tubes

Infertility may result from obstructed or damaged fallopian tubes. It is also referred to as tubal infertility. They obstruct the passage of the fertilized egg into the uterus or prevent male sperm from reaching the egg. Pelvic inflammatory disease, an infection of the uterus, fallopian tube due to chalamydia, gonorrhea, or other sexually transmitted infections, previous surgery in the abdomen or pelvis, including surgery for ectopic pregnancy, in which a fertilized egg implants and develops in a fallopian tube instead of the uterus, and pelvic tuberculosis are all potential causes of damaged or blocked fallopian tubes.

Uterine and Cervical cause

Infertility is caused by uterine and cervical conditions that either interfere with implantation or increase the likelihood of a miscarriage. The uterus is frequently affected by benign polyps, tumors, fibroids, and myomas. A small number of them can obstruct fallopian tubes or impede implantation, which can have an impact on fertility. Implantation may be impaired by endometriosis scarring or inflammation within the uterus. Nevertheless, a significant number of women who have fibroids or polyps become pregnant. Having an abnormally shaped uterus or a narrowed cervix from birth can result in difficulties conceiving. Cervical stenosis may be the result of an inherited malformation. Occasionally, the cervix is unable to generate the optimal mucus to facilitate the passage of sperm through the cervix and into the uterus.

Sexually transmitted diseases (STD)

Sexually transmitted diseases (STDs) are also known as venereal diseases (VDs) or sexually transmitted infections (STIs). The fallopian tubes can be damaged by infections like gonorrhea and chalamydia. Valvodynia and vaginitis may be precipitated by sexually transmitted diseases (STDs). Pelvic pain, pelvic disorders, and painful intercourse. It

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typically manifests when sexually transmitted infections migrate from the vagina to the uterus, ovaries, or fallopian tubes. The potential for sexually transmitted infections to result from unprotected intercourse with multiple partners, which may lead to fertility issues in the future. This does not imply that STDs are transmitted; infections can also be transmitted through lactation and the sharing of needles.

Female Cancers

Fertility may be impacted by female malignancies, including breast cancer, endometrial cancer, ovarian cancer, cervical cancer, vulva cancer, and vaginal cancer. Infertility may result from cancer treatments such as chemotherapy, radiation therapy, and surgery that damage the reproductive organs. Fertility issues and premature menopause may result from the destruction of some or all of the eggs in the ovaries by high concentrations of this therapy.

Obesity

Research indicates that obesity is linked to an elevated production of androgens in adult women and during late female pubescence or adolescence. Androgens are frequently referred to as "male hormones" due to the fact that males generate a greater amount than females. However, both genders necessitate specific levels of androgens for optimal health. Infertility can result from fluctuations in hormonal levels, such as an increase in androgen levels, which can disrupt female reproductive cycles. The risk of asthma and pregnancy loss in women is elevated by obesity. The increased risks of becoming pregnant and failing to maintain a viable pregnancy are known to be associated with asthma.

Psychological factors

Despite the fact that a few studies have discovered an association between stress and the likelihood of conception. An enzyme known as alpha amylase has been associated with elevated or elevated cortisol levels in saliva. The research indicates that the likelihood of pregnancy is reduced for women with elevated levels of alpha amylase. Anxiety and depression are both substantial contributors to infertility, according to certain research studies. Psychological symptoms, including anxiety, depression, tension, and irritability, are associated with the medications used to treat infertility, including leuprolide, clomiphene, and gonadotropins.

Diet

Fertility in women is diminished by a high intake of dietary fiber. Research results indicated that the consumption of dietary fiber is associated with breast cancer and reproduction. A significant factor in breast cancer and reproduction is the increase in estrogen hormone levels that results from a decrease in fiber consumption. Therefore, researchers propose that diet may be a contributing factor to infertility in certain women.

Environmental and lifestyle factors

Fertility is decreasing due to environmental factors, including pesticides, fertilizers, plastics, radiation, and other substances. The rapid decrease in fertility is being attributed to a variety of lifestyle factors, such as obesity, nutrition, mobile phone use, dietary practices, tobacco smoking, alcohol consumption, and marijuana. Fertility is also influenced by the use of anabolic steroids and the administration of medications to treat bacterial infections.

Impact of Cigarette Smoking

Research has suggested that cigarette consumption is positively correlated with reduced fertility in women. It has an impact on the reproductive hormones of women, such as estradiol, progesterone, follicle stimulating hormone (FSH), and luteinizing hormone (LH), throughout the menstrual cycle, with a particular emphasis on delayed conception. The levels of FSH and LH hormones increase abnormally in women who smoke cigarettes, and these hormones can lead to infertility.

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Weight

Normal ovulation may be substantially impacted by being overweight or underweight. The likelihood of ovulation and pregnancy may be enhanced by maintaining a healthy body mass index (BMI).

Societal factors

Researchers discovered that infertility was substantially correlated with caste, residence, education status, occupation, family size, and socioeconomic status. Women who reside in urban areas are more susceptible to fertility issues than those situated in rural areas. The widespread use of plastics is a result of the pollution of the air from factories, vehicles, and electric generators, which contains chemicals. Furthermore, there is an extensive utilization of pesticides, cosmetics, and detergents.

Health related factors

Ectopic pregnancy, miscarriage, and stillbirth are substantially correlated with increased fertility. Women who have asthma and hay fever experience significantly greater pregnancy losses than those who do not have asthma.

Unexplained Infertility

Occasionally, the precise cause of infertility is never identified. Unexplained infertility may be caused by a variety of trivial factors in both males and females. Despite the fact that it is discouraging to receive no specific response, these issues may resolve themselves over time. However, it is imperative that individuals not postpone their pregnancy treatment.

III. CONCLUSION

The reviewed studies have determined that the prevention of infertility can be achieved by maintaining a normal body weight, quitting smoking, avoiding alcohol, reducing stress, limiting caffeine, and controlling and identifying chronic diseases, as well as performing regular tests and checkups under medical supervision. One of the purported effective preventive measures to address infertility among infertile couples is to encourage the treatment of sexually transmitted diseases and defer pregnancy. Medicine, minor surgery, laparoscopic surgery, hormonal therapy, and the prevention of early pregnancy failure will be employed to address infertility in women. This article is beneficial and useful for all medical and scientific researchers who are interested in eliminating infertility.

REFERENCES

[1]. Ashraf Direkvand-Moghadam. et al. (2013). Epidemiology of Female Infertility; A Review of Literature. *Biosciences Biotechnology research Asia*, 10(2), 559-567.

[2]. Brassard, M., Ainmelk, Y., & Baillargeon, J.P. (2008). Basic infertility including polycystic ovary syndrome. *Medical Clinics of North America*. 92(5), 1163.

[3]. Cai, X., Song, R., Long, M., Wang, S.F., Ma, Y.R., Li, X., et al. (2011). A crosssectional study on the current status of female infertility in three counties of Xinjiang Uygur autonomous Region. *Zhonghua Yi Xue Za Zhi.* 91(45), 3182-5.

[4]. Eman, M.E., & Eman, M. Seif El-Nasr. (2016). Risk factors of secondary infertility among women attending outpatient clinic at cairo university Hospital; Suggested guideline. *World Journal of Nursing Sciences*. 2(1), 01- 10.

[5]. Gaskins, A. J., (2009). Effect of daily fiber intake on reproductive function: the BioCycle Study, *Am J Clin Nutr*. 90(4), 1061-9.

[6]. Germaine, M., & Buck, L. et al. (2011). stress reduces conception probabilities across the fertile window: evidence in support of relaxation. Fertile steril.

[7]. Lamaran, M.D. et al. (2016). Knowledge of infertility among infertile women in Bauchis Northern Nigeria. *International Journal of Women's health and reproduction sciences*. 4(3), 103-109.

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[8]. aur, M. et al. (2018). Burden of infertility and its associated factors: a cross sectional descriptive analysis of infertility cases reported at a tertiary level hospital of Rajasthan. *International Multispecialty Journal of Health*. 4(4), 144-149.

[9]. Kharde, S. (2013). Evaluation of effectiveness of psychological interventions on distress among infertile women undergoing infertility treatment, *PhD thesis* http://hdl.handle.net/10603/70073.

[10]. Kumar, D. (2007). Prevalence of female infertility and its socio-economic factors in tribal communities of Central India. *Rural Remote Health*. 7(2), 456.

[11]. Koning, A.M., Kuchenbecker, W.K., Groen, H., Hoek, A., Land, Ja., Khan, K.S., et al. (2010). Economic consequences of overweight and obesity in infertility: a framework for evaluating the costs and outcomes of fertility care. *Hum Reprod Update*. 16(3), 246-54.

[12]. Mostafa, A. (2013). Abolfotouh et al. Knowledge, attitude and practices of infertility among Saudi couples. *Int J Gen Med*. 10(6), 563-73.

[13]. Mallikarjuna, M., & Rajeshwari, B. V. (2015). Selected risk factors of infertility in women: case control study. International Journal of Reproduction, Contraception, *Obstetrics and Gynecology*. 4(6), 1714-1719.

[14]. Mohammad, R. S. (2006). Infertility among couples in a population-based study in Iran: prevalence and associated risk factors. *International Journal of Andrology*. doi:10.1111/j.1365- 2605.2007.00764.x.

[15]. Millheiser, L.S., helmer, A.E., Quintero, R.B., Westphal, L.M., Milki, A.A., & Lathi, R.B. (2010). Is infertility a risk factor for female sexual dysfunction? a casecontrol study. *Fertil Steril*. 94(6), 2022-5.

[16]. Malik, A., Jain, S., Hakim, S., Shukla, I., & Rizvi, M. (2006). Chlamydia trachomatis infection & female infertility. *Indian J Med Res*. 123(6), 770-5.

[17]. Neog, B. et al., (2018). Selected risk factors of primary infertility among young women at Jorhat City: A case control study. *International Journal of pure & Applied Sciences*. 6(6), 293-298.

[18]. Narjes, D., Tina, M., & Meimanat, H. (2017). Infertility-Related Risk Factors: A Systematic Review. *International journal of women's health and reproduction sciences*. 5(1), 24-29.

[19]. Paul, C. et al. Asthma and /or hay fever as predictors of fertility/impaired fecundity in U. S. women: National survey of family growth. *Scientific Reports 9, Article number*: 18711(2019).

[20]. Infertility among couples in a population based study in Iran: Prevalence and associated risk factors. *Int J Androl*. 31(3), 303-14 Shukria, S.C. (2016).

[21]. Risk factors of infertility among young women at Al-Najaf City, *International Journal of scientific and research publications*. 6(12), 21-30. Sudha, G., & Reddy, K.S. (2013).

[22]. Causes of female infertility: a crosssectional study. International Journal of Latest Research in Science and Technology. 2(6), 119-123. Seshadri, S., & Sunkara, S. (2014). Natural killer cells in female infertility and recurrent miscarriage: a systematic review and meta-analysis. *Hum Reprod Update*. 20(3), 429– 438. doi:10.1093/humupd/dmt056.

[23]. Sami, N., Saeed, A.T., Wasim, S., & Saleem, S. (2012). Risk factors for secondary infertility among women in Karachi, Pakistan. *PLoS One*. 7(4), e35828. doi:10.1371/journal. pone.0035828.

[24]. Sloboda, D.M., Hickey, M., & Hart, R. (2011). Reproduction in females: the role of the early life environment. *Hum Reprod Update*. 17(2), 210-27.