

Lifestyle Diseases: Increase in Infertility Amongst Women

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Abstract

Lifestyle diseases have become a new threat in the current generation affecting primarily the youths and children. These diseases are associated with the lifestyle of people and the kind of norms they follow in the day to day life. More and more instances are showing the drastic impact on people's state of living and habits on their reproductive health and well-being. When it comes to women ovulation and menstrual cycle are the first thing to get affected by any alteration in diet and ill practices of everyday routine. Hormonal imbalances followed by obesity and indulgence in unhealthy practices like smoking, alcohol intake, and excess consumption of caffeinated drinks are the other risk factors. With the throat cut competition and other life problems; stress and depression are the other emerging issues that directly disrupt the functionality and viability of the female genital system. This review paper focuses on the impact of lifestyle diseases on the fecundity and reproductive health of women leading to higher risk of infertility.

Keywords: Infertility; Obesity; Nutrition; Hormonal Imbalance; Stress.

Introduction

Infertility is a significant and emerging health issue across the world, affecting approximately 8% to 12% of couples worldwide. In some countries of sub Saharan Africa, the Middle East, North Africa, Central and Eastern Europe and Central Asia, infertility rates reaches up to 30%. According to a study; probably around 18 to 20 million (25%) are in India alone.¹ A number of well defined lifestyle risks have been identified with age being one of the most primary reason. As women cross the age of 35; their fertility decreases hence it is advised to start a family before crossing early thirties. Rest include delayed childbirth leading to diminished fecundity due to age factor, polycystic

ovarian disorder (PCOD); a leading cause of female infertility accounting for 47% of the cases.⁵ Also infertility in women can't be discussed without mentioning the most reportable infectious diseases; Sexually Transmitted Infections (STI) and Pelvic Inflammatory Diseases (PID), endometriosis (when the uterus lining of tissue grows outside), short luteal phase (less than 10 days).¹⁵ Other factors are hormonal imbalances (hypothyroidism, hyperthyroidism, hyperprolactinemia)²³, lack of nutrition or excessive intake of junk food comprising of food rich in fat and sugar, obesity and absence of a balanced nutrition diet which can ultimately lead to low BMI. Lack of physical activity or exercise is another leading risk factor for a number of diseases and non functionality of various systems. Apart from that psychological conditions also have a

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drastic impact on the proper working of the body with Stress and depression being an important developing issue for the society to deal with, that disturb and deviate the homeostasis of the bodily functions severely. Additionally cigarette smoking, illicit drug use, alcohol intake and immoderate caffeine consumption can destructively influence the reproductive health.

Factors affecting fertility

1. Obesity-Obesity has become a growing ailment amongst the current generation. A study suggests that women with a BMI greater than 25 compared with a BMI less than 25 have a lower pregnancy rate.⁸ Around 50% of women of reproductive age are either corpulent or obese, with women aged in between 25-35 years having a greater risk of considerable weight gain compared with men of all ages³ (Figure-1). With the rest of the harmful impacts such as cardiovascular diseases, high blood pressure, hyperglycaemia; obesity is also associated with many adverse maternal and prenatal foetal effects, with negatively influencing women's ability to conceive.²

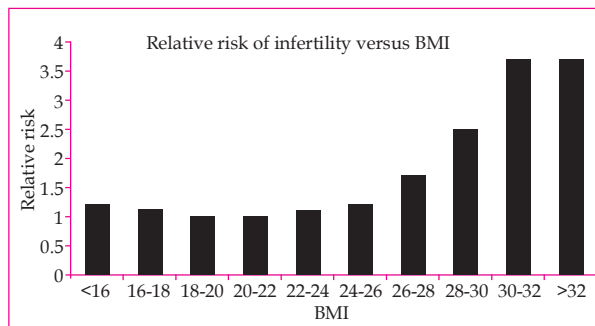


Fig. 1: Graph showing relative risk vs. BMI¹⁷

Courtsey-The impact of lifestyle factors on reproductive performance in the general population and those undergoing infertility treatment

2. Nutrition- The food and type of nutrition we intake is what fuels our body. Unhealthy diet and malnutrition area major cause of infertility amongst women. Various studies suggest that those couples who are dedicated to healthy diet regime show positive reproductive well-being specifically ovulation in women.⁴ According to a study consumption of animal protein is found to be harmful to ovulatory health.¹ Women who take proper diet rich in fruits, vegetables, whole grains, unsaturated oils, adequate

protein specially from plant sources; have improved fertility by 34% and lower risk of impotency due to other causes as compared to women with the lowest intake of this diet pattern.⁶ Intake of supplements like folic acid and antioxidants such as omega 3 fatty acids are known to enhance female fertility.¹⁸

3. Consumption of alcohol and caffeinated supplements- There is an emerging fondness in the use of alcohol and beverages like coffee, tea and soft drinks due to their stimulating effect on the body. Coffee being the main source of caffeine has been found to be a new culprit becoming a risk factor for a number of diseases including cancer, heart diseases and adverse reproductive effects. Caffeine; a xanthine alkaloid, impact women fertility and increase the chances of preterm birth. However it is still under studies to validate the research with more profound results.²⁰ Excessive alcohol intake increases the chances of heart and liver diseases, hypertension, and dementia.¹⁹ Apart from these it negatively affects the fecundity and lowers the fertility. Evidence shows that there is more than 50% reduction in the conceivability in the couples who consume alcohol.¹⁶ Not only that alcohol intake poses threat to fertility but it also lead to decreased chances of live birth, high risk of foetal loss and render the child to complications like Foetal Alcohol Spectrum Disorder.¹⁹
4. Smoking and tobacco consumption being one of the most emerging problem worldwide; smoking is not only injurious to the heart and respiratory system but it also has a destructive effect on the reproductive health of humans. According to a study, Women who smoked more than 10 cigarettes per day had 30-35% increase in the level of urinary FSH during cycle transition and increased incidence of ectopic pregnancies.¹ Moreover women who shared a history of tobacco consumption have shown low level of serum estradiol concentrations, viable embryos and retrieved oocytes.¹¹ Study shows that smoking has an catastrophic effect on ovarian function and earlier menopause, which is long lasting and directly dependent on the tobacco intake.^{12,13} The toxic components of tobacco and cigarette smoke (cadmium, nicotine, cotinine) are mutagenic and have a negative impact on ovarian steroidogenesis , ovulation, fertilization and implantation

by altering the hormonal levels in the luteal phase and may disrupt the reproductive behaviour thereby leading to infertility.^{13,14,15}

5. Psychological distress – Stress in any form be it physical, social, or psychological has become a part of the community. Study suggests that Psychological stress, such as anxiety disorder or depression, affects 12% of women decreasing the chances of conception.²⁶ Stress has a negative impact on all the systems of the body including the reproductive system by affecting it's functioning badly. There is data and evidence implying that the severity of stress and negative mood can lead to anovulation and amenorrhea in women while increased level of anxiety can increase the chances of stillbirth. On the other hand Positive mood is directly related to high success rate in delivering a live baby.¹ Stress interferes with the normal physiology of the body targeting the hypothalamic-pituitary-adrenal (HPA) axis and sympathetic adrenal medullary (SAM) axis and affects the working of every biological system in one or the other way.

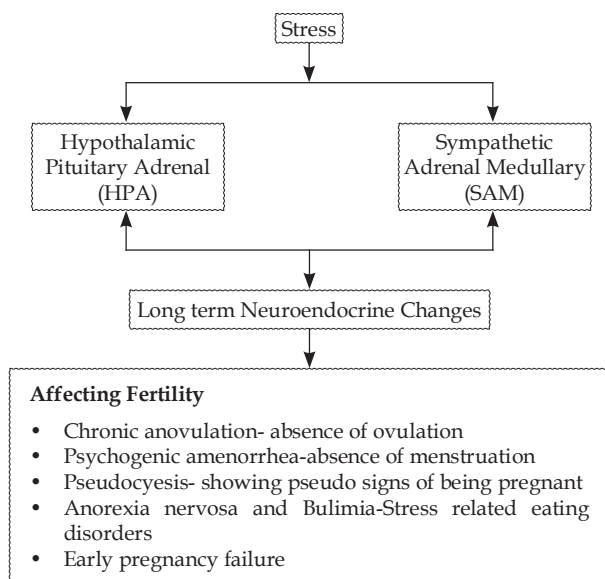


Fig. 2: Hormonal changes due to stress level.^{25,27}

Courtsey - Lifestyle and fertility: the influence of stress and quality of life on female fertility

Stress and Other Environmental Factors Affecting Fertility in Men and Women

6. Physical inactivity-Physical activity is undoubtedly a prerequisite for all human beings. It also plays a major role in enhancing the reproductive health of both males and

females. Study depicted a protective effect on fertility when associated with weight loss in overweight women.¹ According to a study women with abdominal fat have lower chances of getting pregnant²⁴ hence a regular exercise is a must for the proper working of the human body including the reproductive system. According to a study, physical activities have a modulating effect on the ovulation regulating the functioning of Hypothalamic-Pituitary-Gonadal (HPG) axis and increased activity of Hypothalamic-Pituitary-Adrenal (HPA) axis.²¹ However, excessive exercise can also drastically alter the energy balance in the body and affect the reproductive system. The level of intense workout and duration has significant impact resulting in increased chances of infertility.¹

7. Hormonal Imbalances – Hormonal imbalance in women is another important factor contributing to female infertility characterised by irregular menstrual cycles, excessive bleeding or very little bleeding, abdominal cramps, absence or long menstruation.⁸ It is found that there are 2 to 20% of females suffering from PCOS (Polycystic Ovary syndrome) worldwide. PCOS is accompanied by enlarged polycystic ovaries, irregular menstruation and high level of androgens coupled with insulin resistance; resulting in infertility. Additional symptoms include hirsutism, weight gain and acne. Increase in the level of FSH (Follicular stimulating hormone) may result in poor quality of eggs and embryos resulting in low fertility rate which is observed with passing age.²³ Also hormonal changes like luteal phase defect, hyperthyroidism, hypothyroidism, hyperprolactinemia are responsible for affecting ovulation badly. (Table-1)

Table 1: Hormonal inconsistency that affect ovulation.^{23,8}

Hyperthyroidism	High level of thyroid hormones
Hypothyroidism	Low level of thyroid hormones
Hyperprolactinemia	High level of prolactin
Luteal Phase Defect	Low progesterone

- Apart from the above mentioned lifestyle factors, there are two more prominent causes of female infertility –

Sexually transmitted diseases and pelvic inflammatory diseases- Female infertility caused by PID constitute a major health concern across the world. These involving reproductive tract infections

caused by the ascend of pathogenic bacteria like *Chlamydia trachomatis* and *Neisseria gonorrhoeae* along the mucosal surfaces to the endometrium later to the fallopian tube. Many times PID is followed by TFI (Tubal factor infertility). Other microorganisms such as *Mycoplasma genitalium* and *Trichomonas vaginalis* may cause tubal damage causing inability to conceive.²⁴

Discussion

The present article concludes the importance of healthy lifestyle regime in females to avoid complications in the reproductive behaviour and ensure increased conception. The lifestyle diseases have a serious impact on the fertility rate of women. The present culture of eating processed food plentiful of unhealthy fats and sugar accompanied by physical inactivity not only drastically impair the general health but also impacts the quality and fecundity that alters the hormonal levels in the body which emanates further abnormalities. Regular intake of alcohol and smoking have also shown a deleterious impact on the reproductive function in women specifically on ovulation and menstrual health. It has become an utmost requirement to be vigilant enough to follow healthy routine and imbibe good habits to attain a balance in life with optimum biological functioning. Also it is necessary to prevent STI by indulging in safe sex followed by regular checkups. Apart from that a positive and balanced lifestyle followed with the perception of 'ignorance is bane' can not only save us from many long lasting ailments and diseases but it will also protect the reproductive system from falling into the state of premature impairment.

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Conflict Of Interest

Authore have declared no conflict of interest.

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