



# INTERNATIONAL JOURNAL OF PHARMACY AND ANALYTICAL RESEARCH

ISSN:2320-2831

IJPAP /Vol.5 / Issue 4 / Oct - Dec -2016

Journal Home page: [www.ijpar.com](http://www.ijpar.com)

Research article

Open Access

## Effect of modern lifestyle on reproductive health

Dr. Bhanu Pratap Singh<sup>1</sup>, Dr. Om Prakash Dadhich<sup>2</sup>, Dr. Deepa<sup>3</sup>

<sup>1</sup>MD Scholar, Dept. of Sharira Kriya, National Institute of Ayurveda, Jaipur,

<sup>2</sup>Associate Professor, Dean Academic & HOD, Dept. of Sharira Kriya, National Institute of Ayurveda, Jaipur,

<sup>3</sup>M.D. (Sharira Rachana)

\*Corresponding Author: Dr. Bhanu Pratap Singh

Email: [bhanushekhawat17@gmail.com](mailto:bhanushekhawat17@gmail.com)

### ABSTRACT

Infertility defined as the inability of a couple to achieve conception after one year of regular undefended coitus. Sterility is an absolute state of failure to conceive. Conception depends on fertility potential of both male and female partner. The male is directly responsible in about 30-40%, the female in 40-50% and both are responsible in 10% cases. The remaining 10% is unexplained in spite of thorough investigations with modern techniques. The causes of infertility are wide ranging which are such as, ovulatory disorders, tubal disease, endometriosis, chromosomal abnormalities, sperm factors and unexplained infertility. Lifestyle factors have had a spectacular impact on general health and the capacity to reproduce. Some common cause of infertility related to lifestyle such as excessive smoking, alcohol intake, degrading environment, high pollution levels, changes in diet and stress etc. that affect fertility negatively both in male and female. The present topic is taken to find out the role of lifestyle factors play in the development of infertility.

**Keywords:** Lifestyle, Infertility, Sterility.

### INTRODUCTION

Infertility defined as the inability of a couple to achieve conception after one year of regular unprotected coitus. Infertility is termed primary if conception has never occurred, and secondary if patient fails to conceive after previous conception. Commonest causes of female infertility are as follows – Tubal blockage, Ovarian factor, PCOD, Anovulation, Uterine factor, Pelvic causes,

Cervical factor while Pre-mature ejaculation, erectile dysfunction, Varicocele etc found as causes in male infertility. The impact of lifestyle on reproductive performance may vary depending on individual aetiology and circumstances.

*Ayurveda* is a complete life science; its main aim is “to protect health of healthy person and secondarily to cure the person if he becomes ill”. Factors that are responsible for maintenance of fertility are very well explained in *Ayurveda*.

Proper *garbhadhan* takes place when body is fully prepared to accept embryo, and for that our *Acharyas* have given concept of *Ritu*, *Kshetra*, *Beeja* and *Ambu*, when all four factors are in their optimal condition, a good nidation of embryo takes place and give good health to mother as well as foetus [1, 2, 3]. Factors having effect on fertility or infertility are very well explained in *Ayurveda* also.

## FACTORS AFFECTING REPRODUCTIVE HEALTH

### Age

Due to pursuit of education and other factors, many couples are choosing to delay child-bearing. Fertility peaks and then decreases over time in both men and women, thus the age may be one aspect to consider when determining the ideal time to start a family.

According to *Ayurveda* male at the age of twenty five and the female at the age of sixteen are fully mature, hence they should attempt for achievement of conception [4, 5, 6]. *Acharyas* have also advised that very young or old woman should not be impregnated. Concept behind of age of conception is that body of both partners should be in the state that form *beeja* having good quality.

Modern physiology also explains that as the age advances quality of sperm and ovum get affected. Fertility declines due to normal age related changes that occur in ovaries. A woman's best reproductive years are in her 20s. Fertility gradually declines in the 30s, particularly after age of 35. The women do not remain fertile until menopause. In mid to late 30s women become more likely to have genetic abnormalities, chromosomal abnormalities in foetus and miscarriage also. The age related loss of female fertility happens because both quality and quantity of eggs gradually declines. Similarly sperm quality deteriorates somewhat as men get older. As men age, testosterone levels begin to decrease and hypogonadism results. However, if testosterone is used to treat hypogonadism, it can suppress spermatogenesis [7].

### Impact of diet

Eating a healthy diet consisting of appropriate composition and caloric intake is fundamental to maintaining a state of optimum physical and psychological health. It is also important in

preventing diseases such as obesity, cardiovascular disease, diabetes, osteoporosis and some cancers. Diet mediates body weight and composition and should be considered fundamental to reproduction.

Consuming diet rich in carbohydrates, fiber, folate, and lycopene as well as consuming fruit and vegetables correlates with improved semen quality [8]. Consuming lower amounts of both proteins and fats were more beneficial for fertility [9]. A woman's diet may ultimately affect her fertility, particularly ovulation. Overall, replacing carbohydrates with animal protein was demonstrated to be detrimental to ovulatory fertility [10]. Adding just one serving of meat was correlated with a 32% higher chance of developing ovulatory infertility. However, replacing carbohydrates with vegetable protein demonstrated a protective effect. Choosing Trans fats in the diet instead of monounsaturated fats has been demonstrated to drastically increase the risk of ovulatory infertility [11]. Consuming trans fats instead of carbohydrates correlated with a 73% increase in risk of ovulatory disorder. The use of multivitamins and supplements also has an effect. Women who take multivitamins may be less likely to experience ovulatory infertility.

### Exercise

Regular exercise affects an individual's general health and well-being and probably provides some protection from obesity, cardiovascular disease, hypertension, diabetes, osteoporosis and psychological stress. Exercise has only positive effects for the male. Moderately physically active men had significantly better sperm morphology. But in one study from Harvard, more than three hours of aerobic exercise per week for the female was associated with a reduced pregnancy rate with IVF.

### Weight

An individual's weight is often associated with his or her eating habits and amount of activity. Body weight can have significant effects on health, including cardiovascular disease, diabetes, and infertility [12].

The obesity has recently become a serious issue. In addition to other potential health risks, obesity can have a significant impact on male and female fertility. BMI may be a significant factor in fertility, as an increase in BMI in the male can be

associated with infertility [13]. Obese men are three times more likely to exhibit a reduction in semen quality than men of a normal weight [14]. Several studies have demonstrated that an increase in BMI is correlated with a decrease in sperm concentration and a decrease in motility [15]. Overweight men have also been found to have increased DNA damage in sperm [16]. A relationship also exists between obesity and erectile dysfunction (ED). Corona et al. reported that 96.5% of men with metabolic syndrome presented with ED [17].

Women with a BMI over 30 have longer time to pregnancy than women who have a BMI between 20 and 25. Furthermore, obese women had a higher rate of recurrent, early miscarriage compared to non-obese women.

Obesity is not the only way in which weight can impact fertility. Men who are underweight are also at risk of infertility. Men who are underweight tend to have lower sperm concentrations than those who are at a normal BMI. For women, being underweight and having extremely low amounts of body fat are associated with ovarian dysfunction and infertility [18]. Additionally, the risk of ovulatory infertility increases in women with a BMI below 17 [19].

### Psychological effects

Stress is a prominent part of any society, whether it is physical, social, or psychological. Infertility itself is stressful, due to the societal pressures, testing, diagnosis, treatments, failures, unfulfilled desires, and even fiscal costs with which it is associated [20]. Psychological stress may reduce female reproductive performance in various ways. The autonomic nervous system, the endocrine and immune systems have all been implicated. Physical stress has been implicated in influencing female fertility.

### Cigarette smoking

Cigarette smoke is associated with a number of potential health complications such as cardiovascular disorders. There is strong evidence that smoking adversely affects male and female fertility. Smokers are more likely to be infertile and women who are exposed to smoking take longer to conceive. Furthermore, maternal smoking increases the risk of low birth weight and birth defects [21] and women who smoke reach menopause earlier

than non-smokers [22]. Smoking can also damage sperm DNA. In the female, the constituents of cigarette smoke may affect the follicular microenvironment and alter hormone levels in the luteal phase. Heavy smoking ( $\geq 20$  cigarettes per day) by fathers at the time of conception increases the child's risk of childhood leukaemia [23]. Men who smoke before or during attempts to conceive risk decreasing their fertility in comparison to non-smokers. Men who smoke tend to have a decrease in total sperm count, density, motility, normal morphology, semen volume and fertilizing capacity.

### Drugs

Marijuana is one of the most commonly used drugs around the world [24], and it acts both centrally and peripherally to cause abnormal reproductive function. Marijuana contains cannabinoids which bind to receptors located on reproductive structures such as the uterus or the ductus deferens. In males, cannabinoids have been reported to reduce testosterone released from Leydig cells, modulate apoptosis of Sertoli cells, decrease spermatogenesis, decrease sperm motility, decrease sperm capacitation and decrease acrosome reaction.

Another commonly used recreational drug is cocaine, a stimulant for both peripheral and central nervous systems which causes vasoconstriction and anesthetic effects. Cocaine has been demonstrated to adversely affect spermatogenesis, which may be due to serum increases in prolactin, as well as serum decreases in total and free testosterone [25].

Opiates, such as methadone and heroin, are depressants that cause both sedation and decreased pain perception by influencing neurotransmitters [26]. In men taking heroin, sexual function became abnormal and remained so even after cessation. Sperm parameters, most noticeably motility, also decrease with the use of heroin and methadone [27]. In women, placental abruption with the use of heroin may also be a cause of infertility.

### Alcohol

Alcohol is a known teratogen and its consumption has been reported to decrease fertility, although the level of consumption associated with risk is unclear. Alcohol consumption at the extreme level is known to be dangerous to the unborn child; but the effect at lower levels is less certain.

The mechanisms by which alcohol could impair conception are unclear but may include an alcohol-induced rise in estrogen, which reduces FSH secretion suppressing folliculogenesis and ovulation. It may also have a direct effect on the maturation of the ovum, ovulation, blastocyst development and implantation.

Moderate levels of alcohol consumption (seven to eight drinks per week) have been associated with reduced fertility and an increased risk of spontaneous abortion. In men, alcohol consumption has been linked with many negative side effects such as testicular atrophy, decreased libido, and decreased sperm count.

### Caffeine

Caffeine is commonly found in coffee, tea, some soft drinks and chocolate. Some evidence suggests that the consumption of caffeine, with a possible dose-response effect, may prolong the time to pregnancy and affect the health of a developing foetus, although the mechanism for this is unclear. Caffeine may affect ovulation and corpus luteum functioning through alterations to hormone levels and has been shown to be associated with higher early follicular E2 levels in females [28]. Caffeine consumption has also been associated with other causes of infertility including tubal factors and endometriosis and increased risk of spontaneous abortion.

### Environmental and occupational exposures

Many potential threats to reproductive health are encountered in every-day life through biological, physical and chemical sources. These hazards may also have negative ramifications for fertility.

### Air pollution

Air pollution is the release of pollutants such as sulfur dioxides, carbon monoxide, nitrogen dioxide, particulate matter, and ozone. While air pollution has received a tremendous amount of attention in the past few decades for many health reasons, its effects on fertility are less well-known. Negative reproductive side effects of air pollution on women can include preterm delivery, miscarriage, stillbirth, spontaneous abortion, and fetal loss [29].

### Heavy metals

Heavy metals include metals such as lead, mercury, boron, aluminum, cadmium, arsenic, antimony, cobalt, and lithium. Only a few such heavy metals have been researched in connection to reproductive function. Lead interrupts the hypothalamic-pituitary axis and has been reported to alter hormone levels alter the onset of puberty, and decrease overall fertility. Lead may alter sperm quality in men, and cause irregular menstruation, induce preterm delivery, and cause miscarriage, stillbirth, and spontaneous abortion in women. Mercury can disrupt spermatogenesis and disrupt fetal development [30].

Pesticides, endocrine disruptors, and other chemicals:- Many of the chemicals used worldwide in today's society, including pesticides and endocrine disruptors, among others, may have various damaging effects on the reproductive health of both men and women.

### Occupation

Both men and women can be exposed to chemicals and other materials that may be detrimental to their reproductive health while on the job. Heavy metals and pesticides have many negative side effects, particularly for those who work around them. Men working in agricultural regions and greenhouses which use pesticides have overall reduced semen parameters, Oligozoospermia, lower sperm counts, and sperm concentrations decreased. Welding is another possible source of occupational exposure, and plays a role in reduced reproductive health. Factories that produce batteries where workers are exposed to lead may have negative impacts on reproductive capabilities, including asthenospermia and teratospermia. Gardeners may be in contact with pesticides, crafters making jewelry, ceramics, and even stained glass may come in contact with lead; painters may also come in contact with lead-based paints.

### Radiation

Exposure to various kinds and amounts of radiation can have lasting effects in humans. Radiation that is in the form of x-rays and gamma rays can be devastating to the sensitive cells of the human body, including germ and leydig cells.

## CONCLUSION

Lifestyle factors, including age when starting a family, nutrition, weight management, exercise, psychological stress, cigarette smoking, drugs, alcohol and caffeine consumption, environmental and occupational exposures and other behaviours are modifiable and may impact fertility. Caffeine and alcohol consumption adversely affect fertility, most likely in a dose-dependent way. Smoking

reduces male and female fertility and is harmful for the growing baby. Increasing stress and increasing age of marriage disturbs hormonal balance of body with increase level of oxidative stress, which produces various types of toxins in body that affects fertility in form of- physiological changes of reproductive organ, quality of sperm and ovum, problem related to infertility and pregnancy. Lifestyle modification has the potential to improve reproductive health and fertility.

## REFERENCES

- [1]. *Charaka Samhita*, Shashtri Kashinath, Chaturvedi Gorakhanatha Acharya, editor. Varanasi; Choukhabha Bharati Academy; Sharira Sthana 1, 2005, 8/17
- [2]. *Susruta Samhita*. Jadhavji Trikamji, editor. Varanasi; Chaukhambha Orientalia; Sharira sthana 5, 1992, 2/33.
- [3]. *Astanga Sangraha*, Vol I.Gupta Atridev,editor. Varanasi: Oriental Publishers; Sharirasthana 1, 1993, 1/68
- [4]. *Charaka Samhita*, Shashtri Kashinath, Chaturvedi Gorakhanatha Acharya, editor. Varanasi; choukhabha Bharati Academy; Sharira Sthana 1, 2005, 8/6
- [5]. *Susruta Samhita*. Jadhavji Trikamji, editor. Varanasi; Chaukhambha Orientalia; Sutra sthana 5, 1992, 35/13.
- [6]. *Astanga Sangraha*, Vol I. Gupta Atridev, editor. Varanasi: Oriental Publishers; Sharirasthana 1, 1993, 1/4.
- [7]. Stewart AF, Kim ED. Fertility concerns for the aging male. *Urology*. 78, 2011, 496–499. doi: 10.1016/j.urology.2011.06.010.
- [8]. Wong WY, Zielhuis GA, Thomas CM, Merkus HM, Steegers-Theunissen RP. New evidence of the influence of exogenous and endogenous factors on sperm count in man. *Eur J Obstet Gynecol Reprod Biol*. 110, 2003, 49–54.
- [9]. Mendiola J, Torres-Cantero AM, Vioque J, Moreno-Grau JM, Ten J, Roca M, Moreno-Grau S, Bernabeu R. A low intake of antioxidant nutrients is associated with poor semen quality in patients attending fertility clinics. *Fertil Steril*. 93, 2010, 1128–1133.
- [10]. Chavarro JE, Rich-Edwards JW, Rosner BA, Willett WC. Protein intake and ovulatory infertility. *Am J Obstet Gynecol*. 198, 2008, 210.
- [11]. Chavarro JE, Rich-Edwards JW, Rosner BA, Willett WC. Dietary fatty acid intakes and the risk of ovulatory infertility. *Am J Clin Nutr*. 85, 2007, 231–237.
- [12]. Brannian JD. Obesity and fertility. *S D Med*. 64, 2011, 251–254.
- [13]. Sallmen M, Sandler DP, Hoppin JA, Blair A, Baird DD. Reduced fertility among overweight and obese men. *Epidemiology*. 17, 2006, 520–523.
- [14]. Magnusdottir EV, Thorsteinsson T, Thorsteinsdottir S, Heimisdottir M, Olafsdottir K. Persistent organochlorines, sedentary occupation, obesity and human male subfertility. *Hum Reprod*. 20, 2005, 208–215.
- [15]. Martini AC, Tissera A, Estofán D, Molina RI, Mangeaud A, de Cuneo MF, Ruiz RD. Overweight and seminal quality: a study of 794 patients. *Fertil Steril*. 94, 2010, 1739–1743.
- [16]. Chavarro JE, Toth TL, Wright DL, Meeker JD, Hauser R. Body mass index in relation to semen quality, sperm DNA integrity, and serum reproductive hormone levels among men attending an infertility clinic. *Fertil Steril*. 93, 2010, 2222–22231.
- [17]. Corona G, Mannucci E, Schulman C, Petrone L, Mansani R, Cilotti A, Balercia G, Chiarini V, Forti G, Maggi M. Psychobiologic correlates of the metabolic syndrome and associated sexual dysfunction. *Eur Urol*. 50, 2006, 595,604. Discussion 604.
- [18]. Kirchengast S, Gruber D, Sator M, Hartmann B, Knogler W, Huber J. Menopause-associated differences in female fat patterning estimated by dual-energy X-ray absorptiometry. *Ann Hum Biol*. 24, 1997, 45–54.
- [19]. Grodstein F, Goldman MB, Cramer DW. Body mass index and ovulatory infertility. *Epidemiology*. 5, 1994, 247–250.

- [20]. Pook M, Krause W, Röhrle B. A validation study on the negative association between an active coping style and sperm concentration. *J Reprod Infant Psychol.* 18, 2000, 249–252.
- [21]. Hackshaw A, Rodeck C, et al. “Maternal smoking in pregnancy and birth defects: a systematic review based on 173 687 malformed cases and 11.7million controls.” *Human Reproduction Update* 17, 2011, 589-604.
- [22]. ESHRE Task Force on Ethics and Law. “Lifestyle-related factors and access to medically assisted reproduction.” *Human Reproduction* 25, 2010, 578-83.
- [23]. Fakuda M, Fakuda K, et al. “Paternal smoking habits affect the reproductive life span of daughters.” *Fertility and Sterility* 95, 2011, 2542-44.
- [24]. Battista N, Pasquariello N, Di Tommaso M, Maccarrone M. Interplay between endocannabinoids, steroids and cytokines in the control of human reproduction. *J Neuroendocrinol.* 20(1), 2008, 82–89.
- [25]. George VK, Li H, Teloken C, Grignon DJ, Lawrence WD, Dhabuwala CB. Effects of long-term cocaine exposure on spermatogenesis and fertility in peripubertal male rats. *J Urol.* 155, 1996, 327–331.
- [26]. Peugh J, Belenko S. Alcohol, drugs and sexual function: A review. *J Psychoactive Drugs.*33, 2001, 223–232.
- [27]. Ragni G, De Lauretis L, Gambaro V, Di Pietro R, Bestetti O, Recalcati F, Papetti C. Semen evaluation in heroin and methadone addicts. *Acta Eur Fertil.* 16, 1985, 245–249.
- [28]. Lucero, J., Harlow, B. L. et al. “Early follicular phase hormone levels in relation to patterns of alcohol, tobacco, and coffee use.” *Fertility and Sterility* 76(4), 2001, 723-729.
- [29]. Chalupka S, Chalupka AN. The impact of environmental and occupational exposures on reproductive health. *JOGNN.* 39, 2010, 84–102.
- [30]. Sikka SC, Wang R. Endocrine disruptors and estrogenic effects on male reproductive axis. *Asian J Androl.* 10, 2008, 134–145.