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Review article

Review on myths about infertility-an attempt to clear the air

A. Abishek, K. Jayendiran, Cindy Jose*

Department of Pharmacy practice, J.K.K Nattraja College of Pharmacy, Kumarapalayam, Namakkal, Tamil Nadu, India

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***Correspondence:**
Dr. Cindy Jose,
E-mail: cindy.jose@jkkn.ac.in

ABSTRACT

Infertility, defined as the inability to conceive after one year of regular unprotected sex, affects 48 million couples and 186 million individuals globally. There are several myths without factual basis regarding infertility, with the increase in prevalence of infertility in the world, the spread of such myths also increases. Such myths include concepts like infertility is a woman's problem, it is a psychological or stress induced issue, health and lifestyle habits do not affect infertility. While others include, misconceptions about medications and treatment, some supernatural beliefs, frequency of sexual contact, sexual practices which do not have any positive impact on infertile couples. These are few among many other stories revolving around fecundity. Myths about reproductive health and chances of conception may directly or indirectly affect the emotional state of infertile couples or may give a false hope for them to get conceive faster and easier, which have no evidence. Some of the myths might not be harmful, or even do some good, but many of the prevailing myths put infertile couples, especially infertile women in an excruciating position leading to a great deal of mental distress. It is thus important to root out the myths about infertility and help the affected ones lead a less stressful life. This article is an attempt to bust some of the most common myths being spread and explains the actual facts that should be known to people of the reproductive age group.

Keywords: Infertility, Myths, Misconceptions

INTRODUCTION

Infertility, a global public health problem that affects more than 15% of reproductive-aged couples worldwide, is a disease of the male or female reproductive system defined by failure to achieve pregnancy after 12 months/ more of regular unprotected sexual intercourse.[1,2] Around world millions of people are affected with infertility with impacts on their families and communities. It is estimated that globally, 48 million couples and 186 million individuals live with fecundity.[3-5]

Recent reports by the United Nations showed that fertility rate has reduced all over the world with nearly fifty percent reduction in Indians.[6] According to the World Health Organization estimate the overall prevalence of primary infertility in India is between 3.9 to 16.8%. In Indian states prevalence of infertility varies from state to state such as 3.7 per cent in Uttar Pradesh, Himachal Pradesh and Maharashtra, to 5 per cent in Andhra Pradesh, and 15 per cent in Kashmir and prevalence varies in the same region across tribes and caste.[2] In developing countries infertility is more than loss of human potential and veiled self. An array of pathetic and unique problems like economic problems, stigmatization, blame, isolation, guilt, fright, loss of social status, helplessness and, in some cases, violence are a part of infertility.[7-14] Myths are simply stories with no factual basis and synonymous to falsehood or misconception.[15] Reproductive health and fertility being sensitive topics, are surrounded by several stories or myths about improving the chances of getting pregnant. Once such a myth-women conceiving naturally immediately after adopting a child. Other myth conceptions surround post-coital methods that would bring the egg and sperm in

closer together and fertilization easier. Though these myths are all generally safe there is no empirical evidence that these have an influence on pregnancy. For example, 'quit' smoking or drinking, or exercising and maintaining a healthy weight are advantageous to better fertility. Though abstaining from smoking and alcoholism is beneficial to health, these typically maintain baseline fertility and do not increase or decrease fertility by themselves.[16] Though most of the myths are harmless, some tend to give false hopes to the couples and the society in general. Societal norms and religious principles equate fecundity with failure on different levels of life, causing distress to infertile couples. In the majority of cases, women bear the weight of societal prejudices. Psychologically, the infertile woman has much more stress, aggression, anxiety, sadness, self-blame, and suicide ideation than the fertile woman.[17] Being childless has more negative social, cultural, and emotional consequences for women than perhaps any other non-life-threatening ailment, in Asia. According to infertility research conducted in Andhra Pradesh, India, over 70% of women who encounter infertility face physical assault as a result of their "failure". Nearly 20% of the women reported that their husbands used severe violence as a result of their childlessness.[13]

This review article explores the common myths about infertility, prevailing in our society, and explains how these are myths, and not facts.

BUSTING THE MYTHS

Infertility is rare and impacts only a very small section of the Indian population

Fertility is a concern among humans worldwide. But some people still believe that infertility is a rare condition that affects a minority of the population. A socio demographic study about infertility in India using data from the different rounds of the National Family Health Survey, done by Sharma et al found that though the prevalence of primary fecundity at national as well as at the regional level decreased from 1992 to 93 to 2005-06, the prevalence rate showed a remarkable hike in 2015-16. The prevalence, as well as its maximum growth, was found to be higher in the Southern region when compared to the third round of NFHS, indicating the extraordinary lifestyle and higher age at marriage of the women in this region, whereas it is quite the contrary in the Northern States. Though the chance of being infertile may vary from region to region, the pattern was found to be similar for all the areas. Urban women were found to be more susceptible to infertility compared to rural women, indicating the presence of different environmental and lifestyle causes associated with it. The study concluded that a considerable percentage of women experienced the problem of primary infertility in India at national and regional levels, in which southern states are at the top of the list whereas the states from northern regions have comparatively few women who experience infertility. Along with other demographic issues in the country, primary infertility and its related factors should be seen more realistically, as it is not a very rare condition.[18]

Infertility is a woman's problem

Women are not the only ones contributing to nulliparity. According to the global burden of disease survey, the age-standardised prevalence of infertility grew by 0.370% in women and 0.291% in men annually between 1990 and 2017.[19] A systematic review conducted by Agarwal et al found that the number of infertile men ranged from 5,000 to 18,000,000 with a global estimate of 30,625,864 to 30,641,262 men who may be infertile. The highest number of infertile men was found to be concentrated in Europe, with at least 5,459 infertile men in any region. The study also showed that the rate of male infertility was highest in Africa and central/eastern Europe, whereas corresponding rates for North America, Australia, and Central and Eastern Europe varied from 4.5-6%, 9%, and 8-12%, respectively. Males are reported to be primarily responsible for 20-30% of infertility cases, although they also contribute to 50% of all cases. These figures, however, do not adequately represent all parts of the globe. Globally, there is imbalance and inaccuracy in information regarding rates of male infertility due to various challenges. One among the challenges is that population surveys are generally focused on couples or female partners of the couple. Another reason is that due to cultural differences and patriarchal societies in some countries, male infertility is under-reported thus preventing collection and compilation of accurate statistics. The fact that male infertility has never been defined as a disease is also a challenge due to which the statistics is sparse. Furthermore, some studies which examine men focus only on those who visit infertility clinics. But these are small groups which are not representative of the larger population of infertile men.[20] There are a multitude of causes and risk factors contributing to male infertility which can be classified as congenital, acquired, and idiopathic. Some of the known congenital causes are bilateral absence of vas deferens, chromosomal abnormalities leading to deterioration of testicular function, and Y chromosome microdeletions resulting in sperm defects. Acquired factors include varicocele, urogenital tract obstruction, erectile dysfunction, etc.[21] About 30-50% of male infertility cases are idiopathic, with no discernible cause or contributory female infertility.[22,23] Altered semen characteristics and oxidative stress exposure to toxic chemicals and lifestyle factors such as smoking, alcoholism, drug use, obesity and stress constitute idiopathic causes and risk factors.[21]

You can't be infertile if you already have one biological child

Many believe that once a couple successfully gives birth to a child or at least conceives, there are no chances that their further attempts to conceive would become the

futile. However, this is not true, as there exists 'Secondary infertility', defined as the absence of a live birth for women who desire a child and have been in a union for at least five years since their last live birth, during which they did not use any contraceptives. Globally 10-15% of the couples are infertile and the secondary infertility out numbers the primary infertility.[24] However, global and country patterns of secondary infertility are similar to those of primary infertility.[25] Elevated levels of secondary infertility prevail in many countries. Secondary infertility among women aged 20-44 years of age ranges from 5% in Togo to 23% in Central African Republic.[26] Apart from the presence of sexually transmitted disorders, post abortion complications may also contribute to secondary infertility.[27] Caesarean section delivery in previous pregnancy, unhygienic factors during menstruation, delivery and postpartum period could lead to infections ascending through vagina to uterus and fallopian tubes causing adhesions ending up in secondary infertility.[28,29] Other causes and risk factors of secondary infertility are similar to that of primary infertility, in both men and women.[30]

Age impacts fertility of women, not men

Currently there is a trend of delaying parenthood until a certain age due to increased standards of living, pursuing higher education, career advancement, etc. This has an effect on fertility, as aging is non-stoppable and irreversible. Effect of women's age on fertility is well understood as many studies have shed light on the same. But this doesn't mean that aging in men has no adverse effect on fertility. Effect of paternal age on fertility has not been well recognized due to the lack of enough studies to prove the same. However, existing evidence shows that advanced paternal age is associated with changes in reproduction.[31] Age-related alterations lead to gradual changes in hormone levels and spermatogenesis in men especially basic semen parameters, such as semen volume, sperm morphology, progressive motility vitality and concentration of peroxidase-positive cells.[32] Consequently, these progressive changes result in decrease in both quality and quantity of spermatozoa.[33] Although paternal age is not an independent factor in fecundity, it may be significant when combined with maternal age.[34] Independent of maternal age, advanced paternal age is associated with higher rates of spontaneous abortion and lower pregnancy rates in couples attempting to conceive naturally or through IUI.[35]

It is ok for the man or woman to smoke

Smoking, active or passive, adversely affects most of the organs of our body and reproductive system is of no exception. Though wide spread information is available about carcinogenic effects of smoking and its effect on different organs, its effect on fertility has been less documented. However, certain studies have established the relationship between smoking (active and passive) and reduced fertility.[36-41] Studies show that smoking affects semen quality. Semen quality deteriorates in direct proportion to the number of cigarettes smoked. As evidenced by the prevalence of asthenozoospermia in light smokers, there is no "safe" amount of cigarette smoking.[42] Further smoking tense to decrease semen volume and fertilizing capacity.[43] According to Augood et al women who smoke have significantly higher odds ratio of infertility (OR=1.60; 95% CI=1.34-1.91) when compared to non-smokers.[41] This reduction could be due to decrease in ovarian function and depleted ovarian reserve.[44] Exposure to cigarette smoke impairs every stage of the reproductive process and each part of the reproductive system such as folliculo-genesis, steroidogenesis, embryonic development and transport, endometrial maturation, implantation and early placentation, uterine vascular velocity and myometrial activity. Cigarette smoke compounds interact with different reproductive targets, depending on individual sensitivities, the presence of other toxic substances and according to time, dose, type as well as duration of exposure.[45]

Weight problems and eating habits have no effect on fertility

Every individual has different dietary habits and does have different body weights. This affects reproductive performance just like any other body function, irrespective of gender. Studies show that in females inadequate nutrition intake i.e., poor intake of proteins, vitamins, micro and macro minerals, which is responsible for under or overweight affects ovarian function subsequently decreasing the fertility. Variations in body weight are suspected to produce ovulatory disorders. Studies have reported that women with body mass index (BMI) >25 kg/m² (overweight) or<19 kg/m² (underweight) take longer time to conceive.[46,47] In male, nutrition affects semen quality both negatively and positively. Vegetables and fruits, fish and seafood, nuts, seeds, whole-grain and fiber-rich items, chicken, and low-fat dairy products should all be included in the diet. Low consumption of fruits and vegetables, as well as antioxidant-rich products, a high caloric intake, a diet high in saturated fatty acids and trans fats, low fish consumption, and a high proportion of both red and processed meat, on the other hand, have a negative impact semen quality, which may contribute to male fertility reduction. Therefore, a modification of lifestyle, particularly with regard to the diet, seems to be indispensable with regard to male infertility associated with semen quality.[48] In males, obesity adversely affects fertility by altering semen parameters, endocrine changes and information and oxidative stress. Obese males are three times more likely than normal weight men to have reduced semen quality.[49] Therefore following healthy eating habits and maintaining normal body weight will improve reproductive performance.

Stress affect fertility only in women

Stress, whether physical, social or psychosocial, is the prominent part of society. Studies conducted in men reveal that stress, despite its type, significantly affects the semen parameters like density, count, motility and morphology.[50] This could be attributed to reduced testosterone and luteinizing hormone pulsing, disrupted gonadal function.[51,52] Though the relationship between stress and infertility is quite clear, uncertainties exist as to which is the cause and which is the effect. However, decreased stress levels have been found to be associated with improved fertility.[53] Similarly in women stress has a negative impact on fertility. Women experiencing job stress were found to take longer to conceive when compared to others.[54] Decreased fertilization of oocytes were found when stress increased. This could be attributed to the level of stress hormones, especially alpha amylase which is found to negatively correlate with fertility.[55] Thus there exists a relationship between stress and fertility in both men and women. Regardless of the existing relationship, it cannot be concluded that infertility is a psychological problem as stress is one among the various factors responsible for infertility. Evidence shows that receiving psychological support and counselling to effectively deal with stress helps to reduce anxiety and depression and thus increase the chances of conception.[56,57] However, mental relaxation alone cannot be considered as a solution to infertility, contrary to the misconception that relaxation could result in successful pregnancy.

Chances of pregnancy increase with having intercourse every day

Often elderly people in the society blame the couples for not trying enough to conceive. This is due to the misconception that increasing the frequency of sexual intercourse increases the chances of pregnancy. Understanding the menstrual cycle will clarify this misconception. Female menstrual cycle comprises 28 days, out of which, six days, i.e., six days before ovulation and the day of ovulation are called the 'fertile window'. Studies considering the fertile window model show that during this period, the chances of conception are higher when compared to the other days.[58] This fertile window approach can be particularly beneficial in the women whose cycle is regular as well as of normal length. In case of the uncertainties in predicting the fertile days, couples can engage in intercourse two to three times a week.[59] Moreover, very frequent ejaculations could reduce the count, concentration as well as the motility of sperm thus reducing the potency and the chances of pregnancy.[60-62] However intercourse during the fertile window is not the only factor determining the successful pregnancy. Elements such as the viability of the sperm and egg perceptive of the uterus etc. which very widely among couples, also determine the success.[63,64]

Sperm function is better after a long period of abstinence (decision not to have sexual intercourse)

A notion exists in the society that refraining from sexual intercourse would preserve sperm quality and thus improve its function. Though certain studies show that abstinence plays an important role in maintenance of sperm quality, the recommended duration of abstinence is controversial.[65] Varying duration of abstinence affects semen parameters differently. While semen pH remains the same irrespective of duration of abstinence, parameters like count and volume increase with increase in duration of abstinence.[66] Semen motility and morphology are found to decrease with abstinence beyond 5 and 10 days respectively.[66,67] Though the effects of prolonged abstinence on semen quality are inconclusive it is recommended not to exceed 10 days of abstinence as it could affect semen performance negatively thus undermining the fertility potential.[67-69]

Putting your legs up after intercourse, or avoiding standing, will improve your chances of conception

When regular sexual practices aiming at pregnancies don't work, women are often advised to remain immobile, lie on the back, preferably with the legs raised up or at least refrain from standing up straight, so as to increase the chances of fertilization. Although many women believe that sitting supine for a period of time after intercourse aids sperm travel and avoids semen leaks from the vaginal canal, this idea is unfounded.[70] Sperm can be found in the cervical canal seconds after ejaculation, regardless of coital position. Movement of the sperms inside the female body is not controlled by gravity. Irrespective of the post coital position, healthy motile sperms will find their way to the egg. Sperms deposited at the cervix at midcycle are found in the fallopian tubes within 15 minutes.[71] Therefore such practices do neither good nor harm.

Being on birth control pills for a prolonged period leads to infertility

Birth control pills, known as oral contraceptives, are drugs used not only for contraception but also to correct certain hormonal imbalances that alter the menstrual cycle. Women often fear that being on oral contraceptives for a prolonged time period would make them infertile. This might seem to be true in the first sight, as the primary role of oral contraceptive pills is to prevent conception. The relationship between oral contraceptive use and subsequent fertility has not been thoroughly researched, however most studies have found that fertility declines only immediately after quitting use. A reduction in fertility in the first months after stopping oral contraceptive use might also be explained by the delay of the body in returning to normal ovulation.[72] However, research proves the opposite. It was found that those who used oral contraceptives experienced significantly less infertility than those who never used.[73] A study

conducted by Farrow et al to identify the association of prolonged use of oral contraception with risk of conception showed that increasing duration of oral contractive views was significantly associated with an increased proposition of conceptions within 12 months.[72] This could be attributed to the protective effect of oral contraceptives on the endometrium by reducing proliferation and menstrual shedding.[74,75] Another mechanism of beneficial effect of long term oral contraceptive use is improved iron stores.[76] Furthermore, use of the progestogen-only pill has no reported association with delayed conception.[77] Therefore women who have to be on oral contraceptives for a prolonged time, especially for treating conditions like endometriosis and other menstrual disorders need not worry about developing infertility just because of taking birth control pills.

If a couple adopts a child, the woman will get pregnant

"No positive results yet? Try adopting and your chances of conception will likely increase!" This is something almost every infertile couple would have come across during their journey of infertility. Several studies conducted on this resulted in conflicting results. Successful pregnancy post adoption has been observed only in less than 8% of infertile couples, as per the study conducted by Hanson and Rock et al.[78] Conception subsequent to adoption is attributed to the lowering of stress related to infertile treatment, assisted reproductive methods and the relaxation experienced post adoption. However, ample evidence shows that adoption does not relieve the suffering over infertility and its detrimental effect on a woman, which continues for years.[79] A study conducted by Rock et al comparing 249 infertile couples who adopted, with 113 similar couples who did not adopt, could not prove the hypothesis that adopting a child will increase the chances of the couple conceiving.[80] Luckily, infertile couples do conceive against expectations if they are not using contraception, whether or not they adopt, but adoption does not make this statistically more likely.[81] Thus spontaneous pregnancy post adoption is something anyone can hope for, but the probability is low.[82]

It is ok to self-medicate

Drugs are chemical substances formulated to be used mainly for treatment of various diseases and disorders. Along with necessary beneficials effects, they often bring side effects to other systems of the body. While the side effects of numerous drugs on various organs and organ systems are well studied their effects on fertility are often overlooked. Infertility is often considered as a secondary consequence of drug induced sexual dysfunction. Many drugs are either suspected or shown to affect reproductive capacity adversely. The effects of drugs may depend upon its dose and duration of the treatment, along with other factors.[83] Non-steroidal anti-inflammatory drugs (NSAIDs) have been found to affect fertility in females through mechanisms like delaying ovulation, reducing progesterone level below normal, formation of cysts, etc.[84] In males, various drugs affect the reproductive system by interfering with the hypothalamic- pituitary-gonadal axis or directly on gonads. As a result spermatogenesis, sperm parameters and sexual function are affected. However, most of these side effects may be reversible while others irreversible. Though the mechanisms are often unclear and proofs are scanty it is always better to seek expert advice before starting a medication.

Treatment can simply cure infertility

Infertility is a life changing diagnosis for affected couples and, like other conditions, can be treated. Depending upon the cause, treatment may vary from medications to surgical interventions or assisted reproductive technology.[85] Gonadotropin therapy can be used to address sperm abnormalities, while medicines that stimulate ovulation can be used to cure anovulation. Tubal obstruction may require surgical intervention. In case of ineffective drug treatment and unexplained infertility assisted reproductive technologies such as intrauterine insemination or in vitro fertilization are used.[86] Such empirical treatments may improve various fertility parameters but their effect on clinical fertility is not proven yet.[87] Treatment patterns, especially in case of ARTs are often complex, and thus affect the individual and couple both physically and mentally.[88-90] Rising cost of treatment for infertility, varying durations of treatment before finding success, and the fear of outcome, add on to the factors which make the journey of infertility a tough one.[88-92] Therefore, infertility cannot be taken for granted!

Perhaps this is God's way of telling you that you'll aren't meant to be parents!

People around the world have different concepts about God and religions. Likewise, their views about infertility from a religious perspective also vary. Some believe it was karma coming back to them or they have been punished for having premarital sex.[93] While others blame it on God, believing that it is God's way of telling them that they are not meant to be parents or that it is God's trial for them.[94] Religious coping may have positive or negative effects. Positive coping strategies, such as praying and engaging in religious activities to shift their focus from stressful factors, improves the mental health of the affected person or couple. Whereas negative coping strategies like expressing dissatisfaction with God or seeking control through individual initiative could worsen their emotional stress and quality of life.[95] Though prayer is powerful for those who pray with conviction, prayer alone (without action) may not always prove to be successful. Religion is more or less a very personal matter. But the prevailing myths or false belief on religious backgrounds often push infertile women into mental turmoil due to stigmatization.[96]

CONCLUSION

Infertility in itself is a difficult journey for the affected individuals, couples and family. This is made worse by discrimination from the society which views infertile couples as low to others just because they don't bear children. This could be highly attributed to the various myths prevailing in our community. Lack of proper awareness regarding the truth of infertility along with ignorance inflamed the spread of myths even in the so-called “educated” society. The myths discussed above, do more harm than good to the infertile couples and their families even in this scientifically sophisticated world. Religious myths, among the others, often bring about the worst effects, as these affect the couples to a completely different extent. Health professionals can be encouraged to initiate discussion with the patients, regarding their religious background and beliefs, in addition to their medical history. Every individual in the society is responsible to prevent the spread and not believe in such baseless stories that create fear and distress among the affected ones.

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