

# A Clinical Round up of the Female Infertility Therapy Amongst Indians

PRINCY LOUIS PALATTY, PRATIBHA S. KAMBLE, MEERA SHIRKE, SANJAY KAMBLE, MANOHAR REVANKAR, VIJAYA M. REVANKAR

## ABSTRACT

**Background:** Infertility varies across the regions of the world and it has been estimated to affect 8 to 12% couples worldwide. It tends to be the highest in countries with high fertility rates. The WHO has estimated the overall prevalence of primary infertility in India to be between 3.9 and 16.8%. Moreover, the prevalence of primary infertility has also been shown to vary across the tribes and castes within the same region in India.

**Area focussed:** Some common medicines which are used to treat infertility in women include—Clomiphene citrate, Human Menopausal Gonadotropin or hMG, FSH, the Gn-RH analog,

Metformin, Bromocriptine, etc. Some modern technologies which assist conception include-assisted reproductive technology (ART), In vitro fertilization (IVF), Zygote intrafallopian transfer (ZIFT), Gamete intrafallopian transfer (GIFT), Intracytoplasmic sperm injection (ICSI) and intrauterine insemination (IUI). Other options like surrogacy and gestational carriers are also there.

**Conclusion:** Female infertility is a challenging issue despite the high fertility rates. ART gives relieve in 41% of the cases, but the most commonly tried methods are pharmacotherapy, ayurvedic preparations and faith healing.

**Key Words:** Female infertility, Invitro Fertilisation, Assisted Reproductive Technology, Clomiphene Citrate, Intracytoplasmic Sperm Injection, Faith healing, Ayurveda, Pumsavana karma

## INTRODUCTION

The recent census shows a steady rise in the population, which is the direct evidence of the increased fertility in the population, yet there are cases of infertility that need to be addressed too. This review plans to compile the causes and the therapy which is afforded in such cases. This review focuses particularly on female infertility.

The fertility rate of the human race is impressive but infertility is yet, a cause for concern. Infertility is the state of being unable to get pregnant or to remain pregnant upto the full term. To deliver a healthy baby, after trying for approximately 1 year.

A lack of uniform definitions has compromised the research on infertility. It has been accepted that the terms infertility, childlessness or sterility, all refer to the incapacity of couples in conceiving or in bearing children when it is desired. The WHO definition which was drawn up by the Scientific Group on the Epidemiology of Infertility has used a two-year reference period:

**Primary infertility:** In the present study, the infertility was labelled as primary if the couple had never conceived despite cohabitation and exposure to the risk of pregnancy (absence of contraception) for a period of 2 years.

**Secondary infertility:** In the present study, the infertility was labelled as secondary if the couple had failed to conceive following a previous pregnancy, despite cohabitation and exposure to the risk of pregnancy (in the absence of contraception, breastfeeding or postpartum amenorrhoea) for a period of 2 years [1].

Due to the small study population, the primary and secondary infertility cases were analyzed together. This review was aimed at determining the medications and the interventions for female

infertility and at analyzing the causes and the factors which led to it.

## METHODOLOGY

A compilation on the treatment and the causes for female infertility was looked for in various Indian journals and in Indian reports in international journals over the past 5 years. Comparisons were made with the earlier study practices. The Indian scenario patients had a strong belief in Ayurveda and hence, noting the prescribing pattern of the Ayurvedic drugs that were often used along with the drugs from the modern system of medicine was required. Our methodology did not analyze statistically as is the usual practice in Evidence Based Medicine, but it only put forth relevant data on the promising treatment options.

## DISCUSSION

A. **The burden of female infertility:** A report states that in India, 13% of the ever-married women who were aged 15-49 years were childless in 1981 (rural 13.4% and urban 11.3%), which had increased to 16% in 2001 (rural 15.6% and urban 16.1%). Over half of the married women who were aged 15-19 years were childless in 1981, which had increased to 70% in 2001 [2].

Infertility affects females in a one third proportion as males, but unknown and combined factors comprise the final third of this proportion. The infertility statistics quote 10% of women in the U.S. ie 6.1 million.

B. **The aetiology of female infertility:** In India, the primary infertility cases are 3.9% (age-standardized to 25-49 years) and 16.8% (age-standardized to 15-49 years), which were found by using the "age but no birth", which was put forth

by the WHO. In Mysore, India, the prevalence of primary infertility in one study on young women was found to be 12.6%, which was within the range which was reported by the WHO. Their analysis revealed that the HSV-2 seropositivity was significantly associated with primary infertility in that group of young, reproductive-age women. The prevalence of the HSV-2 infection was 11.5%, and many of these women had the concurrent *T. vaginalis* infection and BV, as was also reported in other studies. Primary infertility was not associated with the *Candida* infection, the *T. vaginalis* infection, and BV24 [3].

According to the National Family Health Survey (NFHS) 2007, some states in India show low fertility rates, ie. Tamil Nadu -1.8, Himachal Pradesh -1.9, Punjab -2 and Karnataka -2.1, while some other states show high fertility rates i.e., Madhya Pradesh-3.1, Jharkhand -3.3, Uttar Pradesh -3.8 and Bihar -4 [4].

Studies which were conducted in Kanyakumari and Thiruvananthapuram showed the maximum infertility between 25-30 years of age, ie. 43.80% and 36.26% respectively. The %age of the infertile females was more in the urban than in the rural areas in both the districts. Infertility in females has been reported in all the religious groups like Hinduism, Islam, Christianity, etc. In Kanyakumari, 76.64% of the infertile females were unemployed and 23.36% were employed, while in Thiruvananthapuram, the infertility rate was 70.18% in unemployed women. This infertility was significantly correlated with a family history of infertility as well as with menstrual irregularities (40%, 44.11%) [5].

In the U.S., the pregnancy rates by the age of the woman were the highest in 1990 and 2005 for women in their twenties, they were intermediate at the ages of 18–19 and 30–34 years, and they were lowest at the ages of under 18 years and 35 years and older [6]. The infertility in the UK (2010) can equally be attributed to males and females, with both being responsible in 30% of the cases. Combined issues account for 10% and unexplained problems account for as much as 25% of the fertility cases [7].

The female infertility is difficult to diagnose, but it abounds in therapeutic options. Usually, a history of ectopic pregnancy, irregular periods, pelvic inflammatory disease and thyroid disease reflect infertility. The increased risk factors for the female infertility are advancing age, sexually transmitted diseases, weight problems, endocannabinoid discrepancy, radiation and chemotherapy insults and substance abuse, especially smoking and alcohol use. The ultimate cause of the female infertility translates to the anovulatory cycles, blocked fallopian tubes and uterine and ova malformations.

Acquired and genetic factors have an equal share in the aetiology of infertility. Mutations, spontaneous and environmental, indeed are also responsible- BMP15, CBX2, FEF8, EMRF, KISIR, etc.

The prevalence of obesity is low in India as compared to that in the western countries like England and the US. It affects the fertility and the fertility treatments. A high BMI reduces the chances of conception in ovulatory women and it also affects the outcome of the ovulation induction treatment. Obesity is associated with a lower fertilization rate, poor quality embryos and higher miscarriage rates. The obese also need higher doses of gonadotropins if they are using the IVF technology. These women also respond poorly to the ovarian stimulation and have fewer oocytes harvested [8].

The diagnosis may be done both by examination and imaging and it can be confirmed by laboratory tests. The prevention is effected by maintaining a healthy lifestyle, treatment and by preventing diseases and an undelayed parenthood.

- C. **The therapeutic modalities for female infertility:** The therapeutic options vary between pharmacotherapy and intervention. Pharmacotherapy is first tried, with the drug of choice being Clomiphene citrate- an ovulation inducer.

**Clomiphene citrate** is a drug of considerable pharmacologic potency. It has been demonstrated to be a useful therapy for anovulatory patients who desire pregnancy. The available data have suggested that both the oestrogenic and the antioestrogenic properties of Clomiphene may participate in the initiation of ovulation. The two Clomiphene isomers have been found to have mixed oestrogenic and antioestrogenic effects which may vary from one species to another. Some data have suggested that *zu*Clomiphene has a greater oestrogenic activity than *en*Clomiphene. Clomiphene citrate has no apparent progestational, androgenic, or antiandrogenic effects and it does not appear to interfere with the pituitary-adrenal or the pituitary-thyroid functions. Clomiphene citrate increases the spermatogenesis by the maturation of the spermatogonia in males.

Clomiphene citrate alone can be used as the first-line therapy for the treatment of infertility in women with the polycystic ovary syndrome. There is no significant benefit of combination therapy with clomiphene and metformin over clomiphene alone with respect to the live-birth rate [9].

The Follicle Stimulating Hormone (FSH), the human menopausal gonadotropin, the gonadotropin releasing hormone, Metformin and Bromocriptine are also used in combination or alone.

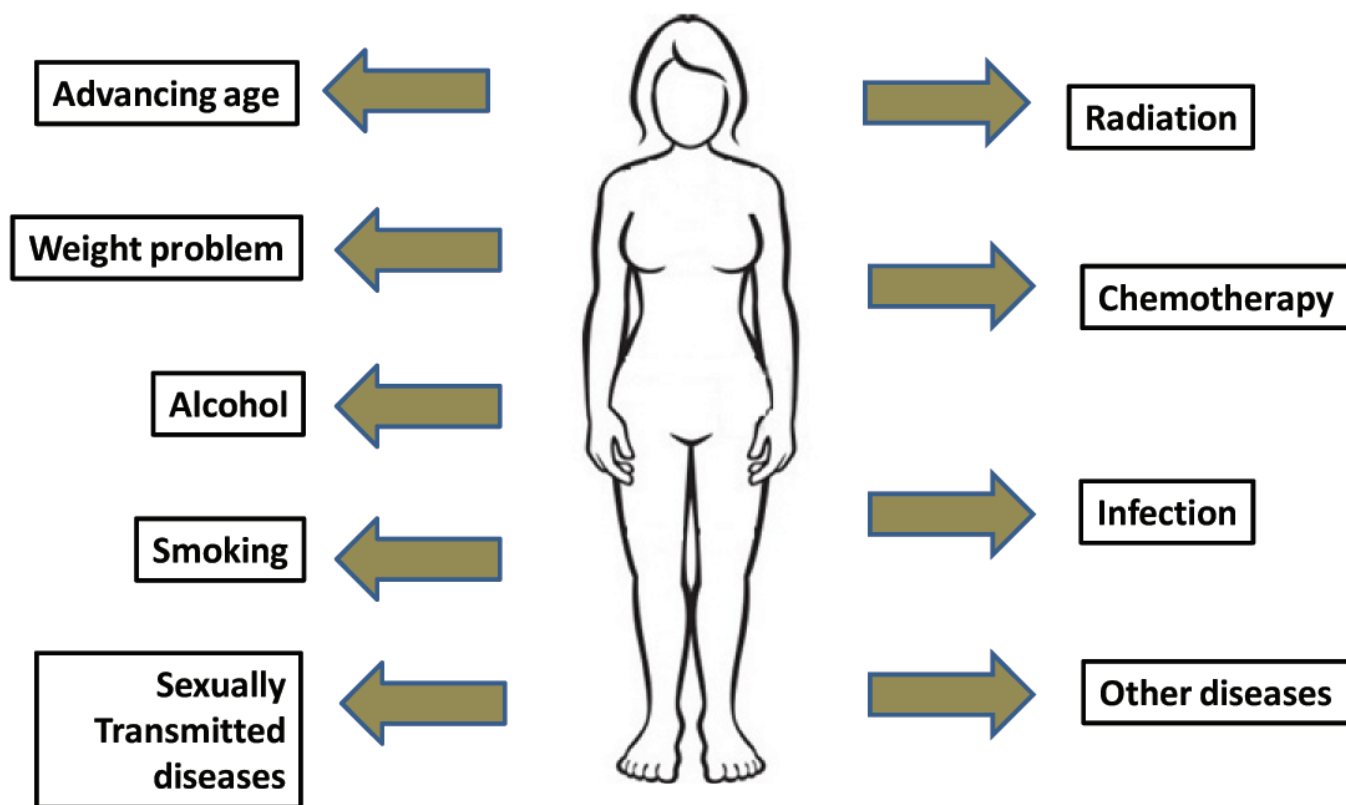
The **FSH** test is usually done to diagnose the problems with the sexual development, menstruation, and fertility. This test is used to diagnose or to evaluate menopause, polycystic ovary syndrome, ovarian cysts, irregular vaginal bleeding, or infertility. It is also done in children who start sexual development at a very young age and in men who have infertility, who do not have testicles or whose testicles are underdeveloped.

The normal FSH levels will differ, depending on a person's age and gender. In males, a normal FSH level of 0–5.0 mIU/ml

Pharmacotherapy	ART	Ayurvedic	Folklore Medicine	Faith Healing
Clomiphene Citrate Metformin Bromocriptine FSH LH GnRH analogues	IVF (ZIFT & GIFT) ICSI IUI Surrogacy Gestational carrier	Solanum surrattense Ficus bengalensis Aloe vera Asvagandha Brahmi Shatavari	Shivlingi Majuphal	

Different Therapies for Female Infertility

## Causes of female infertility



is seen before puberty, during puberty, it is 0.3–10.0 mIU/ml and in adults, it is 1.5–12.4 mIU/ml, while in females, before puberty, it is 0–4.0 mIU/ml, during puberty, it is 0.3–10.0 mIU/ml, in menstruating women, it is 4.7–21.5 mIU/ml and in postmenopausal women, it is 25.8 - 134.8 mIU/ml (mIU/ml = milli international units per millilitre).

Sometimes, abnormal FSH results can be seen in some clinical conditions like hypopituitarism, Klinefelter's syndrome, polycystic ovary disease, Turner's syndrome, ovarian failure (ovarian hypofunction), ovarian or adrenal cancers, precocious puberty in girls and boys, anorexia, etc. [10-12].

In India, generally we give an FSH and an LH recombinant rather than FSH and LH alone (LH alone is not used in India).

**The Gonadotropin-releasing hormone analogue (GnRH-a)** therapy has been approved for the treatment of endometriosis and uterine fibroids. The GnRH-a therapy may be used for dysfunctional uterine bleeding or ovarian cysts and endometriosis and when an ultrasound has confirmed that uterine fibroids are present and that they cause significant symptoms.

The GnRH-a therapy decreases the production of the hormone, oestrogen, to the levels that women have after menopause. This decreases

- ovulation and stops menstrual periods (but it does not provide a dependable pregnancy prevention).
- the growth and the size of the endometriosis sites (implants).
- the uterine size.
- uterine fibroid growth and it promotes fibroid shrinkage [13,14].

The side effects of this GnRH therapy includes hot flashes, mood swings, vaginal dryness, a decreased sexual interest, increased LDL (low-density lipoprotein) cholesterol levels, decreased HDL (high-density lipoprotein) cholesterol levels, insomnia and headache.

The GnRH analogues are goserelin acetate, leuprolide acetate, nafarelin acetate.

These GnRH analogues are given by the parenteral route. Nasal sprays are not used in India.

The human Menopausal Gonadotropin (hMG) and the recombinant human Follicle-Stimulating Hormone (rFSH) are gonadotropin fertility drugs.

- MG contains natural FSH and LH which are purified and obtained from the urine of postmenopausal women. (After menopause, women produce high levels of gonadotropins which are excreted in their urine.)
- FSH is genetically synthesized in the laboratory.

The combination human menopausal gonadotropin (hMG)/ human chorionic gonadotropin (hCG) or recombinant human follicle-stimulating hormone (rFSH)/hCG treatment can consistently stimulate the ovulation. It results in pregnancies in 60% of the women who fail to ovulate. But among such pregnancies, up to 35% end in miscarriages [15].

**Metformin** is an antihyperglycaemic agent which improves the glucose tolerance in the patients with type 2 diabetes, lowering both the basal and the postprandial plasma glucose levels. The use of metformin, an insulin-sensitizing agent, in PCOS patients who undergo IVF or ovulation induction has been extensively researched, but with divergent results. Now,

a new study has reported that metformin significantly reduces the incidence of the Ovarian Hyperstimulation Syndrome (OHSS) and miscarriage, while positively affecting the oocyte and the embryo quality in CC-resistant PCOS women who undergo IVF. The results of the randomized controlled study have been published in the *Journal of Obstetrics and Gynecology* [16]. On the contrary, a recent review which was written by Tso et al (*Cochrane Database of Systemic Review*, 2009) concluded that metformin administration prior to and during the ART cycles did not increase the pregnancy and the live birth rates in PCOS women [17].

**Bromocriptine** has been the most widely used prolactin-lowering agent since its introduction in 1972. Bromocriptine is highly effective for normalizing or reducing the prolactin levels in hyperprolactinaemic patients, and it restores the normal gonadal function in approximately 70-90% of the patients. A new dopaminergic ergoline derivative, cabergoline, has been found to suppress the serum prolactin levels in hyperprolactinaemic patients and several reports concerning women have been published [18].

These results have shown the better efficacy of cabergoline, both in pregnancy and in lowering the serum level of prolactin. In addition, most of the side effects had a significantly lower incidence among the patients who received cabergoline than those who were administered bromocriptine.

Multiple pregnancy is the main downside of this option. Mostly, anovulatory cycles and infertility, despite the normal reports, are amenable to the drug therapy and they achieve a success rate of 50%.

An interventional approach in the form of Assisted Reproductive Technology (ART) is commonly tried in those who are without financial problems. ART, which includes in vitro fertilization, gamete in vitro fertilization, zygote intra fallopian tube and intrauterine insemination have been tried although they are expensive ventures with substantial success. Surrogacy uses the ovum of the surrogate and the fertilized embryo is allowed to grow. It is handed over to the concerned parent at the birth of the offspring. Gestational carriers are used in cases of uterine malformations in the women who thus require the hiring of a womb till the offspring is delivered.

One hospital in Mumbai, India, made success in assisting the birth of over 2300 babies through the IVF technology since October 1990 till now.

**Assisted Reproductive Technology (ART):** According to the 2009 CDC fertility clinic success rates (U.S.), the average percentage of the ART cycles that led to a live birth were:

- 41% in women who were younger than 35 years of age
- 32% in women who were aged 35–37 years
- 22% in women who were aged 38–40 years
- 12% in women who were aged 41–42 years and
- 5% in women who were aged 43–44 years

In the Indian system of Ayurveda, the approach to the female infertility is entirely different. The modern system of medicine, as we have seen, is only successful in 17% of all the infertility cases. Assisted reproductive technology and pharmacotherapy have been the most fruitful methods. The inadvertent loose of medication in infertility has not very successful due to ambiguous aetiology. The patients in India

who have exposure to an array of alternative systems of medicine, impatiently resort to one of these systems; folklore medicine, Ayurveda, Pranayama, Siddha and Unani.

### The Ayurvedic Preventions which are Commonly Used

In ayurveda, we compare the human body to the miniature universe. There is a sun–pitta, moon–kapha and vayu–vata in our body, which is the same as compared to the universe. As a sprout comes out as a result of the combination of the season, soil, water and seed, conception takes place positively if these 4 factors are combined properly. In the human body, the fertility factor depends on the Ritu-ovulation period, the kshetra-uterus, the ambu–pervading rasa dhatu which is formed by the digested food, the bija- ovum and the sperm. (Su Sharira ch.2: 33).

If there is any impairment in the above 4 factors, conception will not take place. In Ayurveda, 20 types of pathologies which are related to the genital organs have been discussed as yoni vyapath. These are caused by the wrong regimen, menstrual morbidity, genetic defects and as a result of evil actions which were done in the previous life (Daiva ). [Charak, chikitsa sthana chapter 30]

When the reproductive system is afflicted by any of this yoni rogas, a woman becomes incapable of retaining or receiving the semen, as a result of which she does not conceive.

### Yoni Vyapath

1. **Vatika yoni Roga:** If a woman has a vata constitution (Prakriti) and if she resorts to food and regimens which aggravate the vayu, then the aggravated vayu gets located in the reproductive organs and produces pain, ache, stiffness, a tingling sensation, dryness, numbness, fatigue, etc and she gets an untimely menstrual discharge which is frothy, thin and dry, which is associated with sound and pain.
2. **Paithika yoni roga:** It is caused by the intake of pungent, sour, salty, alkaline and similar other types of food. The woman suffers from a burning sensation, suppuration and fever. The menstrual discharge becomes heavy, blue, yellow or black in colour and it has an offensive smell.
3. **Kaphaja yoni roga:** With the intake of abhishyandi (which obstructs the channels ) food, the aggravated kapha vitiates the reproductive system and causes itching, sliminess, mild pain and pallor of the genital organs. Her menstrual discharge will be pale and slimy.
4. **Sannipatika Yoni roga:** If the woman indulges in samashana ( intake of good and bad food which has all tastes together), then all the 3 doshas which are located in the genital tract and the uterus get vitiated and they cause the signs and symptoms of all the 3 doshas.
5. **Rakta yoni, Asradgdhara (D.U.B):** If the woman resorts to food and regimens which increase the rakta and pitta, then her blood gets vitiated by the excess flow of the pitta through the genital tract. The blood flow does not stop even when he woman becomes pregnant. The pregnancy does not continue because of the excess blood flow.
6. **Arajaska (Amenorrhoea):** If the pitta is located in the vagina and the uterus, this vitiates the blood and there will be no menstruation. There will be extreme emaciation and discolouration of the skin. In Astanga samgraha, Vagbhata explains this as Lohita kshaya, which is manifested by the aggravation of vata and pitta, which causes a decrease or



loss of the menstrual fluid, which is accompanied by a burning sensation, emaciation and discolouration of the vagina (A.S. uttara. 38) [20]

7. **Achra:** If hygiene is not maintained, micro organisms grow in the genital tract and cause itching.
8. **Aticharana:** Because of excessive sexual acts, the aggravated vayu causes swelling, numbness and severe pain.
9. **Udavartini (dysmenorrhea):** If a woman controls her bowel movements, flatus and the urge for urination, the vayu gets aggravated and causes severe pain. The pain stops immediately after the menstrual flow starts.
10. **Putraghni:** The aggravated vata pollutes the ovum and the formed embryo gets destroyed. Vagbhata describes Jaataghni (astanga sangraha uttarasthana ch. 38) which is of similar symptoms.
11. **Mahayoni:** The openings of the uterus and the vagina remain dilated after intercourse. There will be pain and the discharge of frothy blood. There will be protuberance of the muscles and pricking pain in the joints and the groins.

Then, there is Prak chra in puberty, Upapluta in pregnancy and Paripluta (due to the suppression of natural urges like sneeze, etc, the vata gets aggravated, causing oedema, tenderness and pain in the genital tract.), Karnini (polyp), Antarmukhi yoni roga (distortion of the cervix), Suchimukhi yoniroga (Pin hole os), Shushka yoni (dryness of the vagina), Vamini (Semen is thrown out after 6-7 nights) and Shandi (female impotency).

### Rtukala

After the pathology of the uterus, one should consider about the season of the conception. As per Sushruta, it is 12 days after the commencement of the menstruation. (Su Sharira 3: 6) On even days (6,8,10 and so on), the arthava (ovum) will be less and on odd days (5,7 and 9) it will be more. So, the copulation on these days will lead to male and female babies respectively. (A.S. sharira.1) [21].

**Pumsavana Karma:** Once the lady has conceived, before the signs of the pregnancy manifest clearly, pumsavana (a rite which is done to beget a male child) should be done on the Pushya stellar constellation. Milk which is prepared by using herbs like Lakshmana (*Solanum surrattense*) and the sprouts of Vata (*Ficus bengalensis* Linn), is put into the right nostril of the woman if she desires a male child and into her left nostril if she desires a female child. The milk should be swallowed. (A.S. sharira 2)

### Line of Treatment

For the diseases which are caused by vata, the patient should give oleation, fomentation, enema, and such other therapies which alleviate the vayu. Her body should be massaged with oil which is mixed with rock salt and she should be then given fomentation. After the fomentation, her body should be sprinkled with warm water and she should drink meat soup which is prepared by using vayu alleviating drugs. The affusion (decoction of Triphala [*Terminalia chebula*, *Terminalia bellerica*, *Phyllanthus emblica*] or Guduchi (*Tinospora cardifolia*), massage and Pichu kriya (insertion of tampons' soaked in medicated oils in the genital tract). Oils like Guduchyadi taila, Saindhavadi taila and Sukumara taila are used. The paste of Himsra (*Capparis sepiaria* pessary) is kept in the vagina.

In case of the ailments which are caused by Pitta, cooling therapies which are curative of rakta and pitta are administered. The paste

of Panchavalkala [(the bark of Nyagrodha (*Ficus bengalensis*), Udumbara (*Ficus glomerata*), Ashvatha (*Ficus religiosa*), Parisha (*Thespesia populanea* Soland ex correa) Plaksha (*Ficus lacor*)] is applied inside the vagina. Affusion, massage and pichu kriya (insertion of tampons which are soaked in ghee or oil in the genitalia) with the pitta pacifying drugs are also effective. For eg. Shatavari (*Asperagus recemosus*).

In case of Kapha aggravation, pessaries which are prepared by using barley flour, rock salt and the latex of Arka (*Calatropis gigantea*) should be kept in the vagina for a short period. Then the genital tract is cleansed with a douche of luke warm water. If there is stenosis, the dilation is done after the administration of oleation and fomentation. A pessary (varti) which is of the shape and size of the index finger should be prepared out of Pippali (*Piper longum*), Maricha (*Piper nigrum*), etc and it should be inserted in the genital tract. It cleanses the genitalia.

Douching the female genital organs with a decoction of Nimba (*Azadirachta indica*), Jambu (*Eugenia jambolana*), Vasa (*Adathoda vasica*) Triphala, Amra (*Mangifera indica*), Arjuna (*Terminalia arjuna*), Palasa (*Butea monosperma*) and Karanja (*Pongamia pinnata*) cures the morbid vaginal discharges.

Enemas which are given according to the dosha predominance is useful. For eg, in vatika type oil, pittika type medicated milk, in kaphaja decoction of pungent drugs.

### Rakta yoni, Asrgdara ( Menorrhagia )

The intake of yogurt which is mixed with sugar, honey, Yasstimadhu (*Glycyrrhiza glabra*) and Nagara (*Zinzeber officinalis*) is useful. The paste of the root of Thanduliyaka (*Amaranthus spinosus* Linn) which is mixed with honey should be taken along with rice water. Ghee which is cooked with a decoction of Kashmarya (*Gmelina arborea*) and Kutaja (*Holerrhena antidysentrica*) should be used as a douche. Vasa ghrita and maha tiktaka ghrita are given internally.

In Udavarta yoni roga, anuvasan enema and a douche which is made with ghee, oil or enema with milk which is boiled with Dasa mula (roots of Bilva (*Aegle marmelos*), Agnimantha (*Premna mucronata*), Shyonaka (*Oroxylum indicum*), Gambhari (*Gmelina arborea*), Patala (*Stereospermum suaveolens*), Gokshura (*Tribulus terrestris*), shalaparni (*Desmodium gangeticum*), Prashnaparni (*Uraria picta*), Brihati (*Solanum indicum*) and Kantakari (*Solanum xanthocarpum*) are useful.

### The Treatment for Leucorrhoea

The paste of Amalaki (*Phyllanthus emblica*) which is mixed with sugar and honey with water. Vaginal pessaries which are made of Plaksha (*Ficus lacor*), Lodra (*Symplocos recemosus*) or Triphala and *Eugenia jambolana*, samanga (*Mimosa pudica*) are inserted to dry the exudation. Also, the decoction of the same can be used as a douche. A tampon which is soaked in Udumbara tail (the oil which is prepared from *Ficus glomerata*) is inserted in the genital tract. Thereafter, a douche which is prepared with the cold decoction of the same drugs is given. When the genital organs get cleaned by the aforesaid measures, the woman becomes capable of conception, provided the sperm and the ovum (beeja) are unpolluted.

**The medicines for ovulation are as follows:** the powdered roots of *Solanum surrattense* which are taken with milk or ghee in the fertile period with Kumari (*Aloe vera*) juice. Milk which is processed with a decoction of *Asvagandha* (*Withania somnifera*), to which

ghee is added, is given on the 4th day of the menstrual period. A combination of Pippali ( Piper logum ), Sunti ( Zinzeber officinalis), Maricha (Piper nigrum) , Nagakeshara (Mesua ferrea) – should be taken with ghee. (Chakradatta ch. 62:27, 28, 29).

The chraka mentions the Prajasthapana (procreants ) drugs which eliminate the doshas which cause obstruction to the conception. (Ch. Su 4)

### Mode of Action

Amalaki (Phyllanthus embilica), Shatavari (Asperagus recemosus), etc give strength to the uterus and nourish the foetus by their madhura rasa vipaka (sweet taste and metabolite), sheeta (cold) and snigdha (oily) characteristics.

The uterus is made up of blood and muscle tissue. The uterus becomes weak due to mamsa (muscle), meda (fat) – kapha vitiation leading to the accumulation of kleda (exudation). Brahmi (Bacopa monnieri), Katuki( picrorhiza kurroa), Doorva (Cynodon dactylon), Patala(Stereospermum suaveolens) and Haritaki (Terminalia chebula), by their katu (pungent)– tiktha (bitter) – kashaya (astringent) taste, laghu (light) and rooksha (dry) qualities dry the exudation, stimulate the circulation and nourish the foetus.

For a better progeny, drugs like Brahmi (Bacopa monnieri), Lakshmana (Solanum surretense), Amalki (Phyllanthus embelica), Haritaki (Terminalia chebula), Shatavari (Asperagus recemosus), etc be consumed by the mother before and after the conception. (Dravya Guna Vignana 19) [22]

In modern times, because of stress and wrong food habits and life styles, more cases of infertility are being observed. Along with the problems which are mentioned in the ancient classic texts, new problems like polycystic ovarian disease, chocolate cysts, simple cysts, and endometriosis are the reasons which cause infertility. Consuming too much of chicken, cocoa products, spicy and oily food and working late at nights are the causes for above said pathology.

As the first and fore most line of treatment, we ask the women to avoid these foods and lifestyles. The drug of choice for female infertility is Ashoka ( Saraca asoca Roxb De Wilde) – by its astringent taste and cold potency, it strengthens the uterus. It stops the bleeding by contracting the uterine blood vessels and promoting uterine muscular contraction. It stimulates the uterine function by stimulating the decidual and the ovarian functions.

**Kumari (Aloe vera ):** It improves the blood flow to the decidual membrane and it stimulates the uterine musculature to contract. It thus improves the menstrual flow. It should not be given during pregnancy as may cause abortion. It is useful in inducing ovulation.

**Shatavari (Asperagus recemosus):** It nourishes the uterus and gives strength to the muscles and the rakta dhatu which is associated with it. It induces ovulation and it also prevents abortion or miscarriage.

Ashokarista (fermented medicine which is prepared by using Saraca asoca and other herbs) is most commonly used to regulate the menstrual cycle, improve the endometrium and to stimulate ovulation. From the 4th day of the menstruation, Ashokarista, in combination with Kumaryasava (fermented medicine which is made by using Aloe vera and other herbs) should be given. I usually combine this with Aloes compound [a tablet which is made by using Aloe vera, Manjistha (Rubia cardifolia), etc], Rajapravrtini

vati (asafoetida, etc) to induce ovulation. From the 14th day, Ashokarista with Ashvagandharista ( Withania somnifera, etc ) or Punarnavasava ( fermented medicine which is made by using Boerhvia diffusa and other herbs) should be given to maintain the embryo. Along with this, Laptaden (a tablet which is made by using Jeevanti [Leptadina reticulate, etc) and Garbhapala rasa which helps in sustaining the pregnancy should be given. It normalizes the environment which is required for the conception.

In case of the women with high prolactin levels, Chandraprabha vati (shilajit etc.) is given.

When there is heavy menstruation, shatavari (Asperagus recemosus) is the drug of choice to control the bleeding and to strengthen the uterus.

When there is too much of hormonal imbalance or amenorrhea for a long duration and in spite of consuming all types of emmenagogue herbs, when there is no menstruation, we have to opt for Panchakarma treatments like Virechana (removing the toxins by purgation) and Basti chikitsa (introducing the medicine through the anus to remove the toxins in the pelvic region, to strengthen the genital organs and also to pacify the vata ).

When there is leucorrhoea, the vaginal media becomes acidic, which is not favourable for sperms. Giving a vaginal douche of Udumbara (Ficus glomerata) is very beneficial in such cases. Phala sarpi (Ghee which is prepared with Manjistha (Rubia cardifolia), Bala (Sida cardifolia), etc) is another drug of choice for infertility. It is highly effective for all diseases of the reproductory system and also the best for Pumsavana. It is especially useful in cases of threatened abortion and for pregnant women. (A. S. Uttara 39).

The traditional medicine which is being used over the centuries is Ayurveda, which is being held in high esteem and trust. In the event of infertility, couples turn to ayurveda and modern medicine for succour. Indians are known to visit religious places and to take vows and penance for success. Faith healing is integral to the Indians, as their religious fervour runs deep. The ayurvedic concepts are precisely outlined in this review [24].

## CONCLUSION

The incidence of infertility in females is definitely an issue of concern, although it affects only a small%age of the total population. The options which are available, range from ART, despite it being an expensive alternative. Pharmacotherapy is the initial approach for most of the women. The patients look forward to the alternative systems of medicine and faith healing for a quick and successful outcome. Ayurvedic preparations have been reported to be effective in correcting the female infertility.

## REFERENCES

- [1] Kumar D. The tribal literacy disparity in India. *Current Science*. 2005; 88:676.
- [2] Dey S. Infertility rises at an alarming pace in India. English. News. *CN* 2010-07-16 15:04:38
- [3] Adamson PC, Freeman AH, Klausner JD, Reingold AL and Madhivanan P. The prevalence and the correlates of primary infertility among young women in Mysore, India. *Indian J Med Res*. Oct 2011;134:440-46.
- [4] The National Family Health Survey (NFHS), International Institute of Population Science (IIPS), designated by Ministry of Health and Family Welfare (MOHFW) Mumbai, Government of India. 2007
- [5] Shamila S, Sasikala SL. A primary report on the risk factors which affect female infertility in the south Indian states of Tamil Nadu and Kerala. *Indian Journal of Community Medicine*. 2011; 36 (1):59-61
- [6] Ventura SJ, Abma JC, Mosher WD, Henshaw SK. Estimated pregnancy rates for the United States 1990-2005: An update. *National Vital Statistics Reports*. 2009 Oct14;58(4).

- [7] Kathryn Senior UK. *Infertility Facts and Figures*. 22 Feb 2011.
- [8] Pandey S, Pandey S, Maheshwari A, Bhattacharya S. The impact of female obesity on the outcome of the fertility treatment. *Journal of Human Reproductive Sciences*. 2010;3(2):62-67.
- [9] Legro RS, Barnhart HX, Schlaff WD, et al. Clomiphene, Metformin, or both for infertility in women with the polycystic ovary syndrome. *The New England Journal of Medicine*. 2007 Feb8; 356:551-66.
- [10] Lobo RA. Menopause: Endocrinology, consequences of the estrogen deficiency, effects of the hormone replacement therapy and treatment regimens. In: Katz VL, Lentz GM, Lobo RA, Gershenson DM, eds. *Comprehensive Gynecology*. 5th ed. Philadelphia, Pa: Mosby Elsevier;2007;chap 42.
- [11] Lobo RA. Primary and secondary amenorrhea and precocious puberty: etiology, diagnostic evaluation, management. In: Katz VL, Lentz GM, Lobo RA, Gershenson DM, eds. *Comprehensive Gynecology*. 5th ed. Philadelphia, Pa: Mosby Elsevier;2007;chap 38.
- [12] Melmed S, Kleinberg D, Ho K. Pituitary Physiology and Diagnostic Evaluation. In: Kronenberg HM, Melmed S, Polonsky KS, Larsen PR, eds. *Williams Textbook of Endocrinology*. 12th ed. Philadelphia, Pa: Saunders Elsevier; 2011; chap 8.
- [13] Wallach E, Vlahos NF. Uterine myomas: An overview on their development, clinical features, and management. *Obstetrics and Gynecology*, 2004; 104(2):393-406.
- [14] Speroff L, Fritz MA. Dysfunctional Uterine Bleeding. In L Speroff, MA Fritz, eds., *Clinical Gynecologic Endocrinology and Infertility*, 7th ed., pp. 548-71. Philadelphia: Lippincott Williams and Wilkins.
- [15] Davis B, Jocoy S. Gonadotropin treatment for infertility. *Medical Review*. 2008.
- [16] A study reports positive IVF outcomes with Metformin in Clomiphene Citrate-resistant PCOS women. 25 Oct 2009. IVF News. Direct.
- [17] Tso Lo, Costello MF, Albuquerque LE, Andriolo RB, Freitas V. Metformin treatment before and during IVF or ICSI in women with polycystic ovary syndrome. *Cochrane Database Syst Rev*. Apr 2009; 15(2): CD006105.
- [18] Motazedian S, Babakhani L, Fereshtehnejad SM, Mojtahedi K. A comparison of bromocriptine and cabergoline with respect to the fertility outcome of hyperprolactinemic infertile women who undergo intrauterine insemination. *Indian Journal of Medical Research*. May 2010.
- [19] Charaka Samhita Chikitsa Sthana vol. 5 by Dr Ram Karan Sharma and Bhagvan Dash.
- [20] Astanga Sangraha by Prof. Srikanth Murty.
- [21] Sushruta samhita By P.V . Sharma.
- [22] Dravyaguna Vijnana by Dr A. P. Deshpande, Dr Subhash Ranade.
- [23] Bhavaprakasha by Prof. Srikanth Murty.
- [24] Valsangkar S, Bodhare T, Bele S, Sai S. An evaluation of the effect of infertility on the marital, sexual satisfaction and the health- related quality of life in women. *Journal of Human Reproductive Sciences*. 2011;4(2):80-85.

**AUTHOR(S):**

1. Dr. Princy Louis Palatty
2. Mrs. Pratibha S Kamble
3. Dr. Meera Shirke
4. Mr. Sanjay Kamble
5. Dr. Manohar Revankar
6. Dr. Vijaya M. Revankar

**PARTICULARS OF CONTRIBUTORS:**

1. Professor, Department of Pharmacology, Father Muller Medical College, Mangalore, India.
2. Lecturer, Department of Pharmacology, Father Muller Medical College, Mangalore, India.
3. Consultant Ayurvedic Practitioner, Sanjeevani Chikistalaya, Mangalore, India.
4. Assistant Professor, Department of Radiotherapy, Father Muller Medical College, Mangalore, India.
5. Tutor Cum PG., Department of Pharmacology, Father Muller Medical College, Mangalore, India.

6. Associate Professor, Department of Obstetrics & Gynaecology, Kasturba Medical College, Mangalore, India.

**NAME, ADDRESS, E-MAIL ID OF THE CORRESPONDING AUTHOR:**

Dr. Princy Louis Palatty (MBBS, MD)  
 Professor, Department of Pharmacology,  
 Father Muller Medical College, Mangalore -575002,  
 Karnataka, India.  
 Phone: 09686578701  
 E-mail: drprincylouispalaty@yahoo.com

**FINANCIAL OR OTHER COMPETING INTERESTS:**

None.

Date of Submission: **Feb 29, 2012**  
 Date of Peer Review: **Mar 22, 2012**  
 Date of Acceptance: **Jul 22, 2012**  
 Date of Publishing: **Sep 30, 2012**