ejpmr, 2016,3(7), 194-201.

SJIF Impact Factor 3.628

EUROPEAN JOURNAL OF PHARMACEUTICAL AND MEDICAL RESEARCH

www.ejpmr.com

Review Article

ISSN 2394-3211

EJPMR

INFERLTILITY TREATMENT USING HERBAL DRUGS: A REVIEW

Ankaj Kaundal[1]*, Reetika Rana[2] and Mamta Devi[2]

[1]Assistant Professor, Department of Pharmaceutics, Laureate Institute of Pharmacy, Kathog (H.P) – 177101.
[2]Student, Laureate Institute of Pharmacy, Kathog (H.P).

***Corresponding Author: Ankaj Kaundal**

Assistant Professor, Department of Pharmaceutics, Laureate Institute of Pharmacy, Kathog (H.P) – 177101.

Article Received on 11/05/2016 **Article Revised on 31/05/2016** **Article Accepted on 21/06/2016**

ABSTRACT

Infertility is defined as failure of a couple to conceive after 12 months of regular intercourse without use of contraception in women less than 35 years of age; and after 6 months of regular intercourse without use of contraception in women 35 years and older. There are several causes of male and female infertility i.e. Drugs, alcohol, smoking, genetic factors, impotence etc. There are several therapeutic approaches for the treatment of male and female infertility problem including Allopathy, Ayurveda, Unani etc. Drugs derived from natural resources have always been considered safe and also promote the health because they provide various nutritional supplements in addition to the active ingredients which are required for the treatment of disorder. Among the methods used to treat male and female infertility problems, medicinal plants have been used as extracts, decoctions, fractions or semi-purified compounds. For example, extracts of Panax ginseng, Panax quinquefolius and Lepidium meyenii have shown positive effects on sexual desire, while extracts of Asparagus racemous, Withania somnifera, Andrographis paniculata etc. improved sperm parameters, Saraca indica for ovoulation disoreder, Leptadania reticulata for Premature ovarian failure. Plants provide a treatment option that is affordable and available for infertile couples and phytotherapy is an essential form of treatment in our health system. The present review provides an overview of the prevalence, causes, treatment of male and female infertility using herbal medicines.

KEYWORDS: Infertility, Causes, Diagnosis, Treatment, Herbal drugs for infertility.

INTRODUCTION

Infertility is a growing problem all over the world. Infertility is defined as failure of a couple to conceive after 12 months of regular intercourse without use of contraception in women less than 35 years of age; and after 6 months of regular intercourse without use of contraception in women 35 years and older.[1] About 13–18% of couple suffers from it. Infertility is a common condition with important psychological, economic, demographic and medical implications. Demand for infertility services has grown substantially even though the prevalence of infertility has been stable.[2] The World Health Organization (WHO) estimates that 60–80 million couples worldwide currently suffer from infertility. Infertility varies across regions of the world and is estimated to affect 8–12% of couples worldwide. The WHO estimates the overall prevalence of primary infertility in India to be between 3.9% and 16.8%. Estimates of infertility vary widely among Indian states from 3.7% in Uttar Pradesh, Himachal Pradesh and Maharashtra, 5 to 6% in Andhra Pradesh and 15% in Kashmir. Moreover, the prevalence of primary infertility has also been shown to vary across tribes and castes within the same region in India. However, it should be noted that many of these estimates use different definitions of infertility and consider different time periods, which makes direct comparisons difficult between any studies. In a 1982–1985 WHO multicenter study, 20% of cases were attributed to male factors, 38% were attributed to female factors, 27% had causal factors identified in both partners and 15% could not be satisfactorily attributed to either partner. In Indian couples seeking treatment, the male factor is the cause in approximately 23%.[1]

Traditional remedies are part of the cultural and religious life of the people. Herbals drugs have a potential to treat the various types of body ailments. The demand of herbal drugs is increasing day by day in developed as well as developing countries because they are safer and well tolerated as compared to those of allopathic drugs. Further investigation on the plants can increase the isolation of the newer molecules which will be helpful for the treatment of Sexual dysfunction. These plants should be subjected to animal and human studies to determine their effectiveness.[3]

INFERTILITY IN FEMALE

Risk Factors and Causes of female infertility

Infertility may be caused by an underlying medical condition that may damage the fallopian tubes, interferes with ovulation, or causes hormonal complications. These

medical conditions include pelvic inflammatory disease, endometriosis, polycystic ovarian syndrome, premature ovarian failure, uterine fibroids and environmental factors. Other causes of infertility in females include ovulation problems, tubal blockage, age-related factors, uterine problems, previous tubal ligation and hormone imbalance while the main cause of male infertility is poor semen quality.

Environmental factors and infertility

The etiological importance of environmental factors in infertility has been stressed. Toxins such as glues, volatile organic solvents or silicones, physical agents, chemical dusts and pesticides are implicated in infertility. Other potentially harmful occupational environmental exposures such as chlorinated hydrocarbons and fumicides have also been discovered to be associated with the increased link of spontaneous miscarriage in women. Hence individuals having direct contact with or exposure to such chemicals have high chances of having primary or secondary infertility. Estrogen-like hormone-disrupting chemicals such as phthalates are of particular concern for effects on babies of women.

Weight changes and infertility

Ovarian dysfunction could be caused by weight loss and excessive weight gain with body mass index (BMI) greater than 27 kg/m2. Excess weight has also been found to have effect on treatment efficacy and outcomes of assisted reproductive technique. Estrogen is produced by the fat cells and primary sex organs and thus, state of high body fat or obesity causes increase in estrogen production which the body interprets as birth control, limiting the chances of getting pregnant. Also, too little body fat causes insufficient estrogen production and thus menstrual irregularities with an ovulatory cycle. Proper nutrition in early life had been linked to be a major factor for later fertility.

Age and Infertility

Fertility declines with age. Female fertility is at its peak between the ages of 18 and 24 years, while, it begins to decline after age 27 and drops at a somewhat greater rate after age 35. In terms of ovarian reserve, a typical woman has 12% of her reserve at age 30 and has only 3% at age 40. 81% of variation in ovarian reserve is due to age alone, making age the most important factor in female infertility. Ovulatory dysfunction is more common in younger than old couples.

Life style and infertility

Fertility of an individual may be influenced by life style choice. Tobacco smoking and alcohol intake contribute to infertility. Cigarette smoking interferes with folliculogenesis (nicotine and other harmful chemicals in cigarettes interfere with estrogen synthesis), embryo transport, endometrial receptivity, endometrial angiogenesis, uterine blood flow and the uterine myometrium. Some damage is irreversible, but stopping smoking can prevent further damage. Smokers are 60% more likely to be infertile than non-smokers. Smoking reduces the chances of IVF producing a live birth by 34% and increases the risk of an IVF pregnancy miscarrying by 30%. Canabis smoking, such as marijuana causes disturbances in the endocannabinoid system, potentially causing infertility. Alcohol intake, on the other hand, is associated with elevated oestrogen level and this elevated oestrogen level reduces FSH secretions which then suppresses folliculogenesis and results in anovulation.

Hormonal Imbalance and Infertility

The hypothalamus, through the release of gonadotrophin releasing hormones, controls the pituitary gland which directly or indirectly controls most other hormonal glands in the human body. Thus, alterations in the chemical signals from the hypothalamus can affect the pituitary gland, ovaries, thyroid, mammary gland and hence, hormonal abnormalities. Hormonal anomalies that affect ovulation include hyperthyroidism, hypothyroidism, polycyctic ovary syndrome (also known as Stein-Leventhal syndrome) and hyperprolactinemia. Hormonal imbalance is an important cause of anovulation. Women with hormonal imbalance will not produce enough follicles to ensure the development of an ovule. Changes in hormonal balance of the hypothalamo-pituitary-adrenal axis (HPA-axis) could be caused by stress.

Hyperprolactinemia and infertility

Hyperprolactinemia (HP) is the presence of abnormally-high prolactin levels in the blood. Values lesser than 580 mIU/L are considered normal for women. Prolactin is produced by the anterior pituitary gland and is primarily associated with breast development during pregnancy and induces lactation. However, prolactin also binds to specific receptors in the gonads, lymphoid cells and liver. Hyperprolactinaemia may occur primarily as a result of normal physiological changes during pregnancy, breastfeeding, mental stress, hypothyroidism, or sleep. Pathologically, it may be due to diseases affecting the hypothalamus and pituitary gland or secondary to disease of other organs such as the liver, kidneys, ovaries and thyroid. Also, it may be as a result of disruption of the normal body regulations of prolactin levels by drugs, medicinal herbs and heavy metals. Hyperprolactinemia causes infertility by increasing the release of dopamine from the hypothalamus which inhibit gonadotrophin-releasing hormone (GnRH) and thus gonadal steroidogenesis and eventual infertility.

Ovarian functional problem and infertility

Infertility resulting from ovarian dysfunction may be due to absence of eggs in the ovaries or due to a complete blockage of the ovaries. Ovarian dystrophy (physical damage to the ovaries, or ovaries with multiple cysts) and luteinized unruptured follicle syndrome (LUFS), in which case the egg may have matured properly but the follicle failed to burst or even burst without releasing the

egg may occur and cause an ovulatory cycle. Polycystic ovaries syndrome (PCOS) is usually a hereditary problem and accounts for up to 90% of cases of an ovulation. In PCOS the ovaries produce high amounts of androgens, particularly testosterone and thus amenorrhea or oligomenorrhea is quite common. The increased androgen production in PCO results in high levels of luteinizing hormone (LH) and low levels of follicle-stimulating hormone (FSH), so that follicles are prevented from producing a mature egg. The hyperandrogenism can cause obesity, facial hair and acne, although not all women with PCOS have such symptoms. PCOS also poses a high risk for insulin resistance, which is associated with type 2 diabetes.

Tubal factors and infertility

Tubal (ectopic) and peritoneal factors of importance in infertility include endometriosis, pelvic adhesions, pelvic inflammatory diseases usually due to Chlamidia, tubal occlusion and tubal dysfunction. Tubal factors have similar prevalence as peritoneal factors. Endometriosis is a noncancerous condition and may cause adhesions between the uterus, ovaries and fallopian tubes, thereby preventing the transfer of the egg to the tube and thus infertility.

Uterine factors and infertility

Notable amongst uterine factors are uterine malformation such as abnormal uterine shape and intrauterine septum, polyps, leiomyoma and Asherman's syndrome. Benign fibroid in the uterus are extremely common in women in their 30s. Large fibroids may cause infertility by impairing the uterine lining, blocking the fallopian tube, distorting the shape of the uterine cavity or altering the position of the cervix.

Thyroid disease and infertility

Thyroid disease had been shown to be associated with increased risk of prematurity or stillbirth. The prevalence of hypothyroidism in women of reproductive age (20-40 years) varies between 2% to 4%. In primary hypothyroidism the serum thyroxine (T4) level is low and there is decreased negative feedback on the hypothalamopituitary axis. The resulting increased secretion of thyrotropin releasing hormone (TRH) stimulates the thyrotrophs and lactotrophs, thereby increasing the levels of both thyroid stimulating hormone (TSH) and prolactin and thus ovulatory dysfunction due to hyperprolactinemia. Prolactin production can also be stimulated by vasoactive intestinal peptide (VIP), epidermal growth factor and dopamine receptor agonists. Hyperthyroidism on the other hand is characterized by suppressed serum TSH and increased thyroxine (T4), triiodothyronine (T3), or both. Hyperthyroidism in women of reproductive age is caused by Graves' disease, toxic goiter and thyroiditis. In the work of Krassas et al a higher incidence of hyperthyroidism was associated with irregular menstrual cycle ranging from hypomenorrhea, polymenorrhea and oligomenorrhea, to hypermenorrhea.

Sexually transmitted disease (STD) and infertility

STDs are diseases transmitted from either sex through sexual activity with an infected partner caused by viruses, bacteria, or parasitic microorganisms. STDs are a leading cause of infertility. They are often asymptomatic but may display few symptoms, with the risk of failing to seek proper treatment in time to prevent decreased fertilit. Some of the identified STDs (such as syphilis, trichomoniasis, chancroid, Chlamydia, gonorrhea, herpes simplex virus, human papilloma virus, HIV, lymphogranuloma venerum) are treatable while many are not, with HIV virus being the most serious sexually transmitted infection as it eventually leads to death. STDs can also be transmitted vertically from mothers to children during pregnancy and childbirth.

Pelvic inflammatory disease (PID) and infertility

Pelvic inflammatory disease (PID) comprises of a variety of infections affecting the pelvic organs caused by different microorganisms such as bacteria and inflammatory conditions of parts of the gastrointestinal tract that lies in the pelvic area such as salpingitis from septic abortion or ascending infection. PID may be caused by sexually transmitted diseases from Chlamydia trachomatis and Gonorrhea and can eventually result into abscess formation, adhesions, scarring, tubal blockade, tubal damage, ectopic pregnancy and thus infertility. Mumps had also been reported to cause spontaneous abortion in about 27% of cases during the first trimester of pregnancy.

Structural obstruction and infertility

Congenital abnormalities that affect the genital tract may cause infertility. In Mullerian agenesis the vagina or the uterus fail to develop and thus infertility. Also, following pelvic surgery, postsurgical or postinfective uterine or abdominal adhesions and scarrings may occasionally result and this could restrict the movement of ovaries and fallopian tubes and cause infertility. Asherman syndrome as a result of repeated injuries to the uterine linings from multiple dilatation and curettage of the uterus can cause obstructions and secondary amenorrhea.

Chemotherapy and infertility

Studies have shown that the antral follicle count decreases after the third series of chemotherapy, whereas follicle stimulating hormone (FSH) reaches menopausal levels after the fourth series; inhibin B and anti Mullerian hormone levels also decreases following chemotherapy. Drugs with high risk of infertility include procarbazine, cyclophosphamide, ifosfamide, busulfan, melphalan, chlorambucil and chlormethine; drugs like doxorubicin, cisplatin and carboplatin have medium risk while therapies with plant derivatives (such as vincristine and vinblastine), antibiotics (such as bleomycin and dactinomycin) and antimetabolites (such as methotrexate, mercaptopurine and 5-fluoruracil) have low risk of gonadotoxicity.[4]

Diagnosis of infertility in female

a. Medical History and Physical Examination

b. Diagnostic and Imaging Tests

- Imaging tests for examining the uterus and fallopian tubes include ultrasound (particularly saline-infusion sonohysterography), hysterosalpingography, hysteroscopy, fertiliscopy, and laparoscopy. An endometrial biopsy to verify ovulation and Pap smear test are done to view pelvic organs and check for signs of infection. Magnetic resonance imaging (MRI) is the imaging study of choice as it can detect adenomas that are as small as 3-5 mm. Combinations of these imaging procedures may be used to confirm diagnoses.
- Measuring blood urea nitrogen and creatinine is important for detecting chronic renal failure as a cause.
- Pregnancy testing is required unless the patient is postmenopausal or has had a hysterectomy done.
- Insulin-like growth factor-1 (IGF-1) level measurement is done in acromegaly.
- Hormonal assay involves determining the plasma levels of hormones notably luteinizing hormone (LH) to determine ovulation in women and discover pituitary gland disorder, follicle-stimulating hormone (FSH) to determine ovarian reserve, prolactin level to confirm anovulatory cycle, and thyroid-stimulating hormone (TSH) to check for thyroid gland problems. A thyroid stimulating hormone (TSH) level of between 1 and 2 is considered optimal for conception. Measurements of progesterone in the second half of the cycle help to confirm ovulation.
- Immunological tests are done to determine antisperm antibodies in the blood and vaginal fluids. Antibody infertility blood tests are conducted to detect antibodies that destroy the spermatozoa.
- A postcoital test, may be done soon after intercourse to check for problems with sperm surviving in cervical mucous.[4-5]

Treatment for female infertility

- Weight reducing drugs: In obese anovulatory infertile women, a loss of 5-10% of body weight had been discovered to be enough to restore reproductive functions in 55- 100% of women within 6 months.
- Induction of ovulation using gonadatrophins, Human Menopausal Gonadotrophin (HMG)
- Bromocriptine in hyperprolactinemic females.
- Clomifene citrate-human menopausal gonadotrophin (CC-HMG) combination.
- Hormone therapy (e.g., Perganol).
- Surgical intervention.
- Artificial Insemination (AI): AI may be achieved by intracervical or intrauterine insemination. It is performed in an ovulating woman with patent tubes.
- In Vitro Fertilization (IVF): IVF could be used to treat women with damaged fallopian tubes and endometriosis or in cases of unexplained infertility. A standard IVF requires the presence of a functioning fallopian tube and the procedures include gamete intrafallopian transfer (GIFT), zygote intrafallopian transfer (ZIFT) or GIFT-ET which is a combination of GIFT and IVF.
- Intracytoplasmic Sperm Injection (ICSI): ICSI is used when male infertility is the main problem. It involves injecting a single sperm into an egg obtained from in vitro fertilization (IVF).[4, 6]

INFERTILITY IN MALE

The causes of male infertility can be divided into four main areas:

1. Hypothalamic-pituitary disease: 1–2%
2. Testicular disease: 30–40%
3. Disorders of sperm transport: 10–20%
4. Idiopathic: 40–50%

Hypothalamic-Pituitary Disease

Any hypothalamic or pituitary disease can cause gonadotropin-releasing hormone (GnRH) or gonadotropin deficiency (hypogonadotropic hypogonadism) and therefore infertility. These conditions can be subdivided into congenital, acquired, or systemic disorders. It is important to diagnose hypogonadotropic hypogonadism as there are specific therapies available.

Primary Hypogonadism

Primary gonadal deficiency (hypergonadotropic hypogonadism) is an important cause of azoospermia and oligozoospermia. Congenital or developmental disorders, disorders of the androgen receptor, Y chromosome defects, and acquired disorders such as infection, drugs, environmental toxins, and smoking can cause male infertility.

Disorders of Sperm Transport

The epididymis is an important site for sperm maturation and an essential part of the sperm transport system. The vas deferens then transports sperm from the epididymis to the urethra, where they are diluted by secretions from the seminal vesicles and prostate. Abnormalities at any of these sites, particularly the epididymis and vas deferens, can cause infertility.

Idiopathic Male Infertility

Despite careful assessment of all possible causal mechanisms, a cause of abnormal sperm number, morphology, or function cannot be identified in a substantial proportion of infertile men. There are also men who have repeatedly normal semen analyses but cannot impregnate an apparently normal female partner.[7, 8]

Diagnosis of infertility in male

1. **History**
2. **Physical examination**

a. General Appearance

Eunuchoidal proportions suggest androgen deficiency antedating puberty. On the other hand, increased body fat and decreased muscle mass suggest current androgen deficiency.

b. Skin

Loss of pubic, axillary, and facial hair, decreased oiliness of the skin and fine facial wrinkling suggest long-standing androgen deficiency.

c. External Genitalia

- Several abnormalities that can affect fertility can be recognized by examination of the external genitalia:
- Incomplete sexual development can be recognized by examining the phallus and testes and finding a Tanner stage less than 5.
- Diseases that affect sperm maturation and transport can be detected by examination of the scrotum for absence of the vas deferens, epididymal thickening, varicocele and hernia. The presence of a varicocele should be confirmed with the man standing and performing a Valsalva maneuver.
- Decreased volume of the seminiferous tubules can be detected by measuring testicular size by Prader orchidometer or calipers. In an adult man, testicular volume below 15 mL and testicular length below 3.6 cm are considered small.

d. Gynecomastia suggests a decreased androgen to estrogen ratio.

3. **Standard semen analysis**

a. WHO Lower Reference Limits

The WHO has published revised lower reference limits for semen analyses.14 Volume, 1.5 mL; sperm concentration, 15 million spermatozoa/mL; total sperm number, 39million spermatozoa per ejaculate; morphology, 4% normal forms; vitality, 58% live; progressive motility, 32%, total (progressive + nonprogressive motility), 40%.

b. Specialized Semen Analysis

More specialized semen tests are not routinely performed. Sperm autoantibodies, semen biochemistry, semen culture, sperm-cervical mucus interaction, sperm function tests, computer-aided sperm analysis, acrosome reaction, zona-free hamster oocyte penetration test, human zona pellucida binding test, sperm biochemistry and sperm chromatin and DNA assays can be used to help to determine the cause of male infertility under certain circumstances.

c. Genetic Tests

The introduction of intracytoplasmic sperm injection (ICSI) has made it possible for men with severe oligozoospermia and azoospermia to father children, but the genetic risks of this highly invasive technique must be considered. These include the risks of transferring the cystic fibrosis conductance regulator (CFTR) gene, somatic and sex chromosome abnormalities and microdeletions of the Y chromosome.

d. Endocrine Tests

The endocrine assessment of an infertile man includes measurements of serum testosterone, luteinizing hormone (LH), and follicle-stimulating hormone (FSH) and perhaps other tests:

- **Serum Testosterone**

Measurement of a morning serum total testosterone is usually sufficient. In men with borderline values, the measurement should be repeated and measurement of serum-free testosterone may be helpful.

- **Serum Luteinizing Hormone and Follicle-Stimulating Hormone**

When the serum testosterone concentration is low, high serum FSH and LH concentrations indicate primary hypogonadism and values that are low or normal indicate secondary hypogonadism. Presence of low sperm counts and low serum LH concentrations in men who are well androgenized give a suspicion of exogenous anabolic or androgenic steroid abuse.

- **Other Hormones**

Serum prolactin should be measured in any man with a low serum testosterone concentration and normal to low serum LH concentration. Although inhibin assays are not widely available outside of research laboratories, low serum inhibin concentrations may be an even more sensitive test of primary testicular dysfunction than high serum FSH concentrations, provided the assay is specific for inhibin B.[5, 9]

Treatment for male in fertility

1. **Gonadotropin therapy**
2. **Pulsatile GnRH treatment**
3. **Treatment of Uncertain Efficacy**

a. Genital Infections

b. Sperm Autoimmunity

4. **Empirical Therapy**

Many treatments have been used empirically for male infertility, including clomiphene citrate and other hormones, vitamins and kallikrein. However, when placebo-controlled prospective clinical trials have been performed with adequate numbers of subjects in randomized placebo-controlled trials, none of these methods, including clomiphene citrate and human recombinant FSH, has been proven clinically effective in idiopathic oligospermia or azoospermia.[5]

TREATMENT OF INFERTILITY USING HERBAL DRUGS

Fertility herbs address fertility issues by assisting the body in creating hormonal balance. Many couples that start taking fertility herbs get pregnant faster even after years of infertility.

In women, herbal remedies herb treat the underlining reproductive problems like hormonal imbalance, toxic overload, mineral deficiency, endometrial inflammation, stress and metabolic imbalance.

In men herbal remedies support sperm production and increase libido and sexual stamina. The body is capable of balancing, healing and rejuvenating itself when stimulated through the use of herbal remedies and proper nutrition. Herbs posses incredible healing powers and have been used for centuries with great results to treat infertility. Most fertility herbs used to make fertility herbal remedies because these stimulate ovulation, promote healthy uterine lining, increase sperm count and libido.

Herbs for fertility also replenish the body from important minerals and vitamins providing antioxidant compounds, called phytochemicals, which are present only in plants.

Table.1. Herbal Plants used as remedy for infertility condition[1, 2, 3, 10]

S.No.	BOTANICAL NAME	COMMON NAME	FAMILY	PART USED	USES
1.	*Phyllanthus amarus*	Stone breaker	Euphorbiaceae	Aerial part	Treatment of menstrual disorder
2.	*Manihot esculenta*	Cassava	Euphorbiaceae	Root	Treatment of lowsperm count and weak erection
3.	*Macaranga barteri*	Macaranga	Euphorbiaceae	Leaves and bark	Used as remedy for Irregular menstruation.
4.	*Uapaca heudolotti*	Akun	Euphorbiaceae	Root and bark	Treatment of sterility in women
5.	*Glycine max*	Soya beans	Fabaceae	Seed	To boost potency
6.	*Mucuna pruriens*	Cowhage, buffalo bean	Fabaceae	Aeriel part	Treatment of male infertility
7.	*Mucuna sloanei*	Sea bean, Horse eye	Fabaceae	Seed	Used as remedy for low sperm count and weak erection
8.	*Mimosa pudica*	Sensitive plant	Fabaceae	Leaves	Treatment of menstrual disorder.
9.	*Voacanga africana*	Kokiyar	Apocynaceae	Stem bark	Treatment of abnormal menstrual flow.
10.	*Holarrhena floribunda*	Holarrhena, Conessi	Apocynaceae	Root	Treatment of infertility in female.
11.	*Picralina nitida*	Akuamma	Apocynaceae	Leaves	Treatment of infertility in women.
12.	*Raucolfia vomitoria*	Serpent wood, Snake root	Apocynaceae	Root and leaves	Treatment of menstrual disorder
13.	*Uvaria chamae*	Bush banana, finger root	Annonaceae	Root	Treatment of abnormal menstrual flow
14.	*Annona senegelensis*	Custard apple	Annonaceae	Leaves	To enhance potency in male
15.	*Xylopia aethiopica*	Ethiopian pepper	Annonaceae	Fruits	Treatment of infertility in women
16.	*Enantia chlorantia*	African whitewood	Annonaceae	Stem bark.	Promotes fertility in women
17.	*Ficus platyphylla*	Gutta percha tree	Moraceae	Leaves	Treatment of infertility in women
18.	*Ficus capensis*	Fig	Moraceae	Leaves	Treatment of Threatened miscarriage
19.	*Pinnisatum purpureum*	Elephant grass	Graminae	Leaves	To boast fertility in women
20.	*Zea mays*	Maize	Graminae	Seed (dried)	Used as remedy for low sperm count and weak erection
21.	*Cocculus pendulus*	Falor	Menispermaceae	Leaves	Treatment of infertility and irregular menstrual flow in women
22.	*Sphenocentrum jollyanum*	Moonseed	Menispermaceae	Root	Treatment of impotency and erectile dysfunction
23.	*Newbouldia laevis*	Tree of life, fertility tree	Bignoniaceae	Leaves and root	Management of Threatened miscarriage
24.	*Sida acuta*	Broom weed	Malvaceae	Leaves	To arrest threatened miscarriage
25.	*Hibiscus sebdariffa*	Sour Tea	Malvaceae	Root	Promotes fertility in women
26.	*Allium cepa*	Onion	Amaryllidaceae	Leaf (bulb)	Enhances sexual ability
27.	*Allium sativum*	Garlic	Amaryllidaceae	Leaf (bulb)	Promotes and restores fertility in male
28.	*Zingiber officinale*	Ginger	Zingiberaceae	Stem	Treatment of threatened abortion and hormonal imbalance
29.	*Afromomum melegneta*	Alligator pepper	Zingiberaceae	Fruit	Remedy for female infertility
30.	*Glyphea brevis*	Litambia	Tiliaceae	Root	Treatment of menstrual disorder
31.	*Corchorus olitorius*	Bush okra, Jew's mallow	Tiliaceae	Leaf	Treatment of menstrual disorder
32.	*Momordica charantia*	Bitter melon, bitter gourd	Cucurbitaceae	Aerial part	Treatment of female infertility
33.	*Citrullus colocynthis*	Bitter apple, desert gourd	Cucurbitaceae	Fruits and	Promotes and restores fertility in

				leaves	male
34.	*Vernonia amygdalina*	Bitter leaf	Asteraceae	Fruit	Treatment of menstrual disorder
35.	*Dracaena mannii*	Soap tree	Agavaceae	Leaves and bark	Decoction of bark is used to treat male impotency
36.	*Ceiba pentandra*	Silk cotton	Bombacaceae	Stem bark	Management of Threatened miscarriage
37.	*Heliotropium indicum*	Indian helotrope	Boraginaceae	Leaves	To arrest threatened miscarriage
38.	*Anthocleita djalonensis*	Cabbage tree	Loganiaceae	Root	Treatment of infertility and irregular menstrual flow.
39.	*Piper guineense*	African black pepper, Bush pepper	Piperaceae	Leaves	Treatment of infertility and irregular menstrual flow in women
40.	*Ciccus populnea*	Food gum	Vitaceae	Stem	Treatment of low sperm count
41.	*Ocimium gratissimum*	African basil, Clove basil	Lamiaceae	Leaves and fruit	Treatment of low sperm count
42.	*Plantago major*	Plaintain	Plantaginaceae	Fruit (unripe)	To boost potency
43.	*Viscum album*	Santalaceae	Santalaceae	Leaves	Treatment of infertility and menstrual disorder
44.	*Azidirachta indica*	Neem	Meliaceae	Leaves	Treatment of low sperm count
45.	*Musa sapientum*	Banana	Musaceae	Fruit	Treatment of low sperm count
46.	*Glorisa superb*	Flame lily, glory lily	Colchiaceae	Leaves	Treatment of infertility
47.	*Garcina cola*	Bitter cola	Clusiaceae	Seed	Treatment of low sperm count
48.	*Sesamum radiatum*	Benniseed, black	Pedaliaceae	Leaves	Treatment of male infertility
49.	*Cola nitida*	Kola	Sterculiaceae	Seed	Treatment of low sperm count and weak erection
50.	*Cnetis ferruginea*	Leaf of the dog	Connaraceae	Leaf and root	Leaf is used for the treatment of menstrual disorder while the roots are used for the treatment of low sperm count and weak erection
51.	*Psidium guajava*	Guava	Myrtaceae	Fruit	Treatment of erectile disfunction and low sperm count
52.	*Moringa oleifera*	Horseradish tree	Moringaceae	Seed	Treatment of infertility in female and low sperm count
53.	*Carica papaya*	Paw paw	Caricaceae	Fruit (unripe)	Treatment of impotency in men
54.	*Aloe vera*	True Aloe, Burn plant	Liliaceae	Leaf	Increases sperm count
55.	*Amaranthus spinosus*	Spiny amaranth, prickly amaranth	Amaranthaceae	Leaves	Increases sperm count
56.	*Saraca asoca*	Ashoka	Caesalpiniaceae	Bark	Stimulatory effect on the ovarian tissue and may produce an oestrogen-like effect that enhances the repair of the endometrium and stops bleeding.
57.	*Symplocos racemosa*	Lodhra	Symplocaceae	Stem bark	Treatment of Female disorders
58.	*Asparagus racemosus*	Shatavari	Asparagaceae	Root	To arrest threatened miscarriage
59.	*Withania somnifera*	Ashwagandha	Solanaceae	Leaf, Root	Helpful in sexual disorder like erectile dysfunctions and oligospermia
60.	*Chlorophytum tuberosum*	Safed musli	Liliaceae	Root	in curing impotency and low sperm count

Table. 2. Traditional Plants Containing Aphrodisiac Potentials [2,3]

S.No.	Name of Plant	Common Name	Family	Part used
1.	*Abelmoschus esculantus*	Bhindi	Malvaceae	Root
2.	*Abrus precatorius*	Ganja	Fabaceae	Seed
3.	*Acacia catechu*	Catechu	Mimosaceae	Heartwood
4.	*Artocarpus heterophyllus*	Jack tree	Moraceae	Fruit, Seed, Leaves, root
5.	*Bacopa monnieri*	Brahmi	Scrophulariaceae	Whole plant
6.	*Benincasa hispida*	Ash gourd	Cucurbitaceae	Fruit
7.	*Boerhavia diffusa*	Punarnava	Nyctaginaceae	Root

8.	*Cajanus cajan*	Arhar	Fabaceae	Root
9.	*Cannabis indica*	Indian hemp	Cannabinaceae	Leaf
10.	*Cocos nucifera*	Coconut	Arecaceae	Endosperm
11.	*Capsicum annuum*	Capsicum	Solanaceae	Seed
12.	*Coriandrum sativum*	Coriander	Apiaceae	Leaf
13.	*Crocus sativus*	Saffaron	Iridaceae	Stigma
14.	*Dalbergia sissoo*	Shisham	Fabaceae	Wood
15.	*Daucus carota*	Carrot	Umbelliferae	Root
16.	*Emblica officinalis*	Emblic	Euphorbiaceae	Fruit
17.	*Ficus religiosa*	Peepal tree	Moraceae	Bark
18.	*Linum usitatissimum*	Alsi	Linaceae	Seed
19.	*Mangifera indica*	Mango	Anacardiaceae	Bark
20.	*Myristica fragrans*	Nutmeg	Myristicaceae	Seed
21.	*Nerium indicum*	Kaner/Kanail	Apocynaceae	Roots
22.	*Panax ginseng*	Ginseng	Araliaceae	Root
23.	*Prunus amygdalus*	Badama	Rosaceae	Kernel
24.	*Ricinus communis*	Castor	Euphorbiaceae	Seed
25.	*Solanum melongena*	Brinjal	Solanaceae	Unripe fruit
26.	*Syzygium aromaticum*	Clove	Myrtaceae	Dried flower bud
27.	*Tamarindus indica*	Tamarind	Fabaceae	Bark
28.	*Trichosanthes dioica*	Methi	Fabaceae	Seed
29.	*Valeriana jatamansi*	Jatamansi	Valerianaceae	Root
30.	*Zingiber officinale*	Gingembre	Zingeberaceae	Rhizome

CONCLUSION

Herbals drugs have a potential to treat the various types of body ailments. The demand of herbal drugs is increasing day by day in developed as well as developing countries because they are safer and well tolerated as compared to those of allopathic drugs. The outcome of this survey shows that several herbal practitioners employ different plant species as remedy for various fertility cases and therefore the information about the medicinal value of the plant species and the diseases they treat vary from one individual to another. Most of the natural plants in this review are those with aphrodisiac potentials. The therapeutic potential of the plant species under this investigation shows that they possess some phytochemicals and metabolites which are relevant in the treatment of these diseases. The search for natural supplement from medicinal plants is being intensified probably because of its reduced side effects, its ready availability and reduced cost. The potency of the herbal plant drug is significant. Scientific studies and experimental screening of these plants are on the increase. Hence, forest reserves, farms and medicinal gardens should exist to protect these plants from extinction.

REFERENCES

1. Nduche MU, Omosum G, Okwulehie IC. Ethnobotanical Survey of Plants Used as Remedy for Fertility Conditions in Ebonyi State of Nigeria. Scholars Academic Journal of Biosciences. 2015; 3(2B): 214-221.
2. Akondi RB, Pawar KM, Challa SR. Natural compounds to treat male infertility. Pharmacologyonline. 2009; 2: 240-251.
3. Singh R, Singh S, Jeyabalan G, Ali A. An Overview on Traditional Medicinal Plants as Aphrodisiac Agent. Journal of Pharmacognosy and Phytochemistry. 2012; 1(4): 43-56.
4. Olooto, Eniola W, Amballi, Adetola A, Banjo, Abayomi T. A review of Female Infertility; important etiological factors and management. Journal of Microbiology and Biotechnology Research. 2012; 2(3): 379-385.
5. Infertility Diagnosis and Treatment: Medical Policy. Proprietary Information of United Healthcare. Copyright 2016 United HealthCare Services, Inc.
6. Gaware VM, Parjane SK, Merekar AN, Pattan SR, Dighe NS, Kuchekar BS, Godge RK. Female infertility and its treatment by alternative medicine: A review. Journal of Chemical and Pharmaceutical Research. 2009; 1(1): 148-162.
7. Abarikwu SO. Causes and Risk Factors for Male-Factor Infertility in Nigeria: A Review. African Journal of Reproductive Health December. 2013; 17(4): 150-166.
8. Brien LO, Varghese AC, Agarwal A. The genetic causes of male factor infertility: A review. American Society for Reproductive Medicine. 2010; 93(1): 1-12.
9. Sinclair S, Lac ND, Male infertility: Nutritional and environmental considerations. Alternative Medicine Review. 2000; 5(1): 28-38.
10. Hariram SB, Nithyananthi M, Smila KH, Kumar SMRL. A Review on the Male Anti Sterility Herbs in Practice among the Rural and Tribal Communities of Western Ghats for a Potent Drug Discovery. Research Journal of Pharmaceutical, Biological and Chemical Sciences. 2014; 5(3): 961-965.