Current Knowledge of Infertility and its Treatment

[1]Aisha Rassoul Arshad, [2]P.Meenalochini, [3]Muhammad Akram, [4]Muhammad Daniyal, [5]Naveed Munir, [6]Aatiqa Ali

[1, 3]Department of Eastern Medicine, Government College University, Faisalabad,Pakistan

[2]Assistant Professor, Department of EEE, Sethu Institute of Technology, Tamil Nadu, India.

[4.6]TCM & Ethnomedicine Innovative & Development International Laboratory, School of Pharmacy, Hunan University of Chinese Medicine, Changsha, Hunan 410208, PR China

[5]Department of Biochemistry, Government College University Faisalabad-Pakistan

[1]aishaarshad703@gmail.com, [2]meenalochinip@gmail.com, [3]makram_0451@hotmail.com, [4]daniyaldani151@gmail.com, [5]naveedmunir.pk@gmail.com, [6]draatiqaali@yahoo.com

Abstract: Infertility is an inability to conceive for a couple after more than 1 year of regular unprotected intercourse. The study aims to review the current information and treatment strategies of infertility. Data were obtained from Google Scholar, Science Direct, Cochrane data and recently published articles on infertility. There are several causes of male and female infertility, i.e. Drugs, smoking, genetic factors and ejaculation dysfunction. Different therapies are effective in infertility. Here, concluded that early diagnosis and treatment could reduce the rate of infertility

Key words: Infertility, alternative treatments, global databases.

Introduction:

Infertility is the incapability of the couple to conceive for up to 12 months or 1 year in spite of having regular and unprotected sex. The problem may affect both gender and people of all race, color, countries, cultures, socioeconomic status etc. According to an estimate, 60-80 million people suffers from infertility every year worldwide, various conditions can affect the fertility of the women, and those conditions can hinder with the secretions of hormones and ovulation, amongst all those conditions few most common are polycystic ovarian disease, obesity, thyroid disorder and endometriosis [1].

Corresponding Author: P.Meenalochini, Asst. Professor,
Department of ECE, Sethu Institute of Technology
Tamil Nadu, India.
Mail: meenalochinip@gmail.com

The fertility of the women is at its peak up to the age of 24 years, and it begins to turn down after the age of 27 years, and its rate fall by great extent after 35 years of age. According to the population study about fertility 24% male factor, 21% ovarian dysfunction, 28% unexplained factors, 14% tubal factors and 13% other factors are responsible for infertility [2]. Every one person out of six couples is affected by infertility. Female infertility is a condition defined as in which the infertility problem is present only in female partner. One-third of infertility cases are found in which infertility is only due to female infertility, and 50% of cases are those in which female contribute as male infertility is also responsible[3-6]. Though a percentage of the couple need medical advice for conception because not all couples get conception one spontaneously. Fertility of the women is at its peak up to the age of 24 years. While it begins to turn down after the age of 27 years and it's rate fall down by great extent after 35 years of age, according to the population study about fertility 24% male factor, 21% ovarian dysfunction, 28% unexplained factors, 14% tubal factors and 13% other factors are responsible for infertility. The World Health Organization (WHO) is also considering infertility as a public health issue by worldwide. Unexplained infertility is a term, which we mostly heard in the reproductive world. Primary infertility refers to the condition of an infertile woman who has never considered, and secondary infertility to one who has had a previous pregnancy [7]. Female infertility may be due to; when eggs are attaching to the lining of the uterus, at that time, if there some problem occurs with fertilized egg or embryo than it can be a cause of infertility. If eggs not adequately attached to the lining of the uterus than it can be a cause of infertility. If eggs do not move from ovary to uterus then it can also be a cause of female infertility. If there is some problem in ovaries related to the production of eggs than it can also be a cause of female infertility [8].

Physiology of female reproductive Systems

The human reproductive system comprises of uterus, ovaries, fallopian tubes and the vagina. Firstly, the ova are released through ovaries. As an ovum is exerted from ovarian follicles in the abdominal cavity in the monthly cycle, then the ovum passes to the uterus through fallopian tubes where a sperm is reached for the union with ovum. Now this ovum after union with sperm will become a fetus and develop fetal membranes and placenta. Different hormones are used to maintain the conception. So, the hormones, which are ovarian one, are used in pregnancy like estrogen and progesterone. Progesterone is concerned by corpusluteum and growing follicles conceal estrogen hormone. When the conception occurs the ovulation, cycle stops, and the hormones progesterone and estrogen are increased, which produces effects on corpusluteum and uterus. Therefore, that is why these hormones avoid the early miscarriage.

Causes of female infertility

Factors leading to anovulation accounts for 40% cause of infertility these factors include:

Ovarian failure, polycystic ovarian disease, aging, resistant ovarian syndrome, corpus luteal phase defect, excessive secretions of prolactin hormone due to hypothalamus pituitary ovarian dysfunction can also lead to anovulation, a disorder related to hormone and endocrine gland (hypothyroidism, hyperthyroidism, hyperprolactinaemia, hypothalamus pituitary ovarian axis disorder

The tubal factor may cause infertility in 30% of the cases; these factors are:

Salpingitis, history of pelvic inflammatory disease, tubal surgery, genital tuberculosis, any infection-causing blockage of the fallopian tubes, uterine fibroid, uterine polyps, endometriosis (in 15% of the cases)

Cervical factors are responsible for about 4-5% of infertility

Asherman's syndrome, uterine factors such congenital abnormality in the uterus, retroverted uterus, excessive physical activity (i.e. exercise), malnutrition, peritonitis and vaginismus (maybe psychological) [9]

Symptoms of Female Infertility

Infrequent an ovulation, scarring in fallopian tubes, if there is some abnormality in the shape or lining of the uterus and irregular period

Symptoms of hormone fluctuation

Signs of hormone variations in women could specify potential issues with fertility. Skin issues, thinning hair, reduced sex drive, weight gain and pain during intercourse are symptoms are hormone fluctuation.

Primary Infertility

The type of infertility in which the couple has no pregnancy after 1 year of regular intercourse without any birth control method is mentioned as primary infertility [10]. Endometriosis is a condition in which there is some stroma like lesions, and the endometrial glands are found outside the uterus is mentioned as endometriosis. The peritoneal lesions or deep infiltrating disease, superficial implants or cysts on the ovary are different forms of lesions.70% of woman with chronic pelvic pain and 10-15% of all woman are effected by endometriosis in their reproductive age [11, 12]. The polycystic ovary syndrome (PCOS) is predictably demarcated as an amalgamation of anovulation (dysfunctional uterine bleeding, oligomenorrhea and infertility) and hyperandrogenism (acne and hirsutism) with polycystic ovaries [13]. Because of anovulation, the PCO'S is the most common cause of infertility. PCOS is the main leading cause of infertility in worldwide now a days [14]. The ovulation problems like failing to ovulate at all or uneven periods are instigated too. about 40% of female infertility problems. Hormone imbalances or thyroid problems, stress and excessive weight loss, are such things which can be cause of an ovulatory disorders in a female [15]. Ritoneal periorificial implants on the ovary, or deep infiltrating disease Leiomyomas are benign uterine tumors of unknown etiology. Due to precise pathological and physiological conditions the myometrial transformation occurs which produces different kinds of lesions. It mostly affects a woman during their reproductive age, and about 80% of them suffer from it during their whole life [16]. Lesions can be cysts or superficial implants, peritoneal lesions. On the ovary or deep infiltrating disease, with chronic pelvic pain, 70% of a woman is affected by endometriosis, and 10-15% of a woman is affected by it in their reproductive age. Before ultrasound or histological detection of pregnancy (<6 weeks), when serum human chorionic gonadotrophin (hCG) or urinary test is positive than if

there is the loss of a pregnancy or biochemical pregnancy loss is mentioned as miscarriage[17]. The chromosomal or genetic problem of the embryo is the main leading causes of recurrent early miscarriages (within the first trimester) mostly the abnormal chromosomal number causes 50-80% of unprompted losses. In early miscarriages, the structural problems of the uterus is also the main cause which causes pregnancy loss[18].

Secondary infertility

If a couple has prior pregnancy in their reproductive age group, and now, they are not conceiving after one year of vulnerable, unprotected intercourse is named as secondary infertility. The secondary infertility is affecting more than 80 million people worldwide, and 10-15% of couples are infertile. Secondary infertility outnumbers primary infertility[19]. If a couple, have a failure to conceive for whom no exact cause of infertility is found is mentioned as unexplained infertility. Unexplained infertility is also called as idiopathic infertility. Mostly more than the duration of 2 years after unprotected intercourse is considered for the diagnosis to infertility. The criteria for unexplained infertility are varied in different studies, but it affects couples to mostly 10-20% [7]. Factors leading to anovulation accounts for 40% cause of infertility. These factors include; ovarian failure, polycystic ovarian disease, aging, resistant ovarian syndrome, corpus luteal phase defect. Excessive secretions of prolactin hormone due to hypothalamus pituitary ovarian dysfunctioning can also lead to anovulation. Disorder related to hormone and endocrine gland (hypothyroidism, hyperthyroidism, hyperprolactinemia, hypothalamus pituitary ovarian axis disorder. Tubal factor may be a source of infertility in 30% of the cases. These factors are; salpingitis, pelvic inflammatory disease, tubal surgery, genital tuberculosis, uterine fibroid, uterine polyps, endometriosis (in 15% of the cases), cervical factors are responsible for about 4-5% of infertility, asherman's syndrome, uterine factors such congenital abnormality in the uterus, retroverted uterus, malnutrition, peritonitis and vaginismus. The detailed history of the patient can be quite helpful which include her menstrual history, past medical and surgical history, obstetric history, history of any pelvic infection and inflammation, history of any endocrine disorder, contraceptive history any genetic disorder, sexual practices, presence of any symptom of inflammation such as pyrexia, pain and discharge. General physical examination is the second step after history taking which can make the diagnosis clearer; the examination should include: assessment of weight blood pressure, body mass index, hirsutism and acne, an abdominal and pelvic examination can help to rule out the tenderness and pain due to any disease. The vaginal examination may show discharge having the foul smell in case of any pelvic infection, or it may have vaginismus or signs of hyperandrogenism. Transvaginal scan may also useful. Hysterosalpingography is helpful to analyze the presence of any lesion and help to assess the status of fallopian tubes and intrauterine structures. Magnetic resonance imaging can be helpful to diagnose any mass, abnormality of uterus or pelvis and myomas. Making a chart of basal body temperature is a simple way to evaluate about ovulation, as the temperature of the body slightly raised during 12th to 14th day of the menstrual cycle due to the increased level of progesterone in the second half of the cycle. Performing cervical culture can be useful in the identification of any infection (i.e. gonorrhoea, genital tuberculosis, Chlamydia, etc.). To diagnose any defect in the

luteal phase, an endometrial biopsy is the gold standard test. Hormonal detection specifically estrogen, follicle-stimulating, and luteinizing hormones are also beneficial to diagnose about the cause, as LH surge can be seen 12 to 60 hours before ovulation. Hysteroscopy is a procedure used for both diagnostic as well as therapeutic purpose; it can be used to envision the internal structure of the uterus along with fallopian tubes. Laparoscopy (a surgical technique in which a tool is inserted through a small opening by which reproductive organs can be examined). The detailed history of the patient can be quite helpful which include her menstrual history, past medical and surgical history, obstetric history, history of any pelvic infection and inflammation, history of any endocrine disorder, contraceptive history any genetic disorder, sexual practices, presence of any symptom of inflammation such as pyrexia, pain, discharge etc. General physical examination is the second step after history taking which can make the diagnosis clearer; the examination should include Assessment of weight blood pressure, body mass index, hirsutism and acne. An abdominal and pelvic examination can help to rule out the soreness and pain due to any disease. The vaginal examination may show release having the foul smell in case of any pelvic infection, or it may have vaginismus or signs of hyperandrogenism. The transvaginal scan may also beneficial. Hysterosalpingography is helpful to analyze the presence of any lesion and helps to evaluate the status of fallopian tubes and intrauterine structures. Magnetic resonance imaging can be supportive of diagnosing any mass, abnormality of uterus or pelvis and myomas. Making a chart of basal body temperature is a simple way to estimate about ovulation, as the temperature of the body to some extent raised during 12th to 14th day of the menstrual cycle due to the increased level of progesterone in the second half of the cycle. Performing cervical culture can be convenient in the identification of any infection (i.e. gonorrhoea, genital tuberculosis, Chlamydia etc.) To diagnose any flaw in the luteal phase, an endometrial biopsy is the gold standard test. Hormonal detection precisely estrogen, follicle stimulating, and luteinizing hormones is also valuable to detect about the cause, as LH surge can be seen 12 to 60 hours before ovulation. Hysteroscopy is a method used for both diagnostic as well as therapeutic purpose; it can be used to predict the internal structure of the uterus along with fallopian tubes.

Management

Dopaminergic drugs are given in hyperprolactinaemia to restore ovulation. Glucophage or metformin can show results and increased ovulation amongst the patients with polycystic ovarian disease. Clomiphene citrate can also help to induce ovulation and it seems quite effective in it, nearly 80% of the patients respond to this treatment however, there is a risk of having twin pregnancy, normally 50-100 mg per day are given at 3rd day of the menstrual cycle for up to 5 days. Reparative surgery can be done in case of tubal disease but it can increase the risk of consequent ectopic pregnancies. If the patient is suffering from endometriosis then laparotomy or laparoscopic ablation might be required in some cases. If the cause of infertility is unexplained then intrauterine insemination can be considered, it is the procedure in which the healthy sperms taken from the male partner is positioned under the uterus of the female near the time of ovulation.

Alternative treatments

There are many methods which are used in the treatment of infertility. Firstly, we did simple trials to treat infertility: By quitting smoking, timing sexual activity regarding the ovulation cycle and by maintaining a healthy weight are the different lifestyles measures, which are done for fertility. Clomiphene and gonadotropins are the drugs, which are used for persuading the ovulation. In vitro fertilization (IVF) is used as assisted reproductive technologies(ART) as alternative measures to treat infertility [4, 20, 21].

Yoga for natural fertility

If a couple is having difficulty in getting conception than a type of yoga, which is named as fertility yoga, is suggested for such couples. Infertility yoga, it consists of such postures, which are used to expand individuals' generative health, and it increases their chances of getting conception. Infertility yoga the yoga consists of traditional yoga postures and the basic principle of yoga, which produces positive effects on the couple's health [22].

Couples yoga

A progressively common form of fertility yoga, the type of yoga in which postures are completed by the partners help is named as couples' yoga. The couple's yoga is very helpful as it makes better communication between couples and improves their confidence. The couple's yoga also produces benefits to those couples who are experiencing infertility [23].

Naturopathy

Health care system also consists of naturopathy. In naturopathy, the persons are treated on well-founded philosophy without the drug system. In naturopathy, there are some different principle of treatments used to treat the disease. Naturopathy has its own impressions of health. Naturopathy has lesser effects on curative health as compared to defensive health. Naturopathy produces more effects on defensive health, so that's why naturopathy is becoming famous with time[23]. In naturopathy, diet and exercise are used to produce defensive effects on health. An ancient Chinese technique, Acupuncture, is used to treat the diseases by natural methods. Different kinds of yoga-like infertility, yoga is also included in naturopathy to treat the problems. Different kinds of aromatherapies are also included. Homeopathy and herbal medicine are also included in naturopathy to treat the diseases. Different kinds of massage, like oil massage or oil burner massage are used to treat the diseases. To improve individual's health the naturopathy is used.[24, 25].

Flower remedies

In naturopathy to treat the infertility, the flower remedies are used so flower remedies may be taken in combination or alone. Take a glass of water and keep it three quarters then add 3-4 drops of different flower essences in glass (the drops of flower essences should not be more than 7). You can choose your own flower essence drops collection for the remedy. Carefully, the dosage of flower remedy is given to the person because the dropper should not touch the mouth of the person. Only4-6 drops of flower remedy dosage are given on the tongue of the person [26].

She Oak: The hormonal imbalance and fertility issues which cause stress to the patient, which is not good for a person's health. So, she oak is used to diminish the stress.

Wisteria: The flower Wisteria is used to improve the calmness of the patient and encourages the sensuality feelings in the body.

White Chestnut: Also promotes positive thinking.

Aromatherapy

Aromatherapy is used in the treatment of infertility. Aromatherapy also improves the menstrual problems of a woman and makes generative system healthier. Aromatherapy also reduces anxiety and depression. The oils are extracted from plants barks, roots, leaves, and that's why they are affluent[27].

Massage

By the daily massage, starting from the final day of the menstrual cycle on her reproductive organ system can be helpful for the infertility treatment. The wheat germ or almond oil and grape seed oil are the bases which are added in essential oils to dilute it[28].

Oil burner

Oil burners are used to treat infertility. You have to use a container which consists of water and aroma fill in the air, so now add some drops of indispensable oil in that container. It is believed that through the nose capillaries the properties of healing of aromatherapy enter in the body.

Bath

For the reduction of depression, anxiety and stress, a warm bath is taken in which some 5-10 drops of essential oils can be added [29, 30].

Acupuncture

Acupuncture is a technique of treatment that was familiarized 3000 years ago in China, and it is experienced all over the world. It is a procedure of insertion and manipulation of fine needles indefinite points on the body to attain therapeutic determinations. In many women the treatment of Acupuncture with ART (assisted reproduction technology) such as IVF used in case of infertility [31]

Avena sativa

A big reason for not getting pregnant is depression, anxiety or stress, so the Avena sativa is used to reduce the stress level because it produces the soothing effects on the nervous system. Avena sativa produces aphrodisiac effects, which favor warm relations, which is good for fertility. Avena sativa is also beneficial in toning of the uterus. The Avena sativa consists of vitamins and protein, which produces the beneficial effects on the health of the female. Avena sativa can be taken in the form of tea as oat straw tea or by eating oatmeal.

Angelica sinensis

Angelica sinensis is a plant, which boosts fertility because by the use of this plant, the blood flow is increased towards the reproductive organs like the uterus. Angelica sinensis also gives strength to the uterus. Angelica Sinensis is a very famous plant in china. However, there is a specific way to use the Angelica sinensis plant for its action as it is used from the 1st day of the menstrual cycle to the beginning of ovulation. Angelica sinensis is used to produce uterine contractions. Angelica sinensis can be taken as a tea, or it can also be used in cooking [32].

Vitex agnus-castus

The chaste berry can be used in cooking or can also be taken in the form of tea. Chaste berry produces positive effects on the female reproductive system as it strengthens the uterus and also enhances blood flow towards the uterus, which improve fertility. The duration of taking chaste berry plant is specific as it is taken from 1st day of periods. The use of chaste berry is stopped at the start of ovulation days. Chaste berry is a Chinese plant[33].

Punica granatum

Pomegranate is very useful as make the fetus healthier in the womb of the mother. This is also used to increase the blood flow through reproductive organs, which improve infertility. Pomegranate also makes the uterus lining stronger, which lessen the chances of miscarriages. [34-36].

Cinnamomum verum

Cinnamon is used in the treatment of infertility and in ovarian dysfunctions. It is also used to treat PCOS, which is a main leading reason for infertility. Different problems of female-like endometriosis, amenorrhea (when there is the absence of periods) and uterine fibroids which are the causes of infertility can be treated by the use of cinnamon. A woman who is suffering from PCOS, cinnamon is used, which improve the female menstrual cycles [34-36].

The risk associated with herbal medicine

For the positive effect of treatment, it is necessary that the herbs be taken in an appropriate amount. As allopathic medicines, which are used have some side effects the same as if the herbal remedy is not taken in the correct amount then it will produce some harmful effects on health. Following side effects can occur such as heart attack, stroke, seizure, dizziness, headache, dry mouth, cramps, nausea and vomiting, diarrhea, elevated blood pressure, anxiety, irregular heartbeat and insomnia[36]

Conclusion

The current paper also involves a variety of plant drugs and their phytoconstituents involved in the mechanism of anti-fertility. This paper may aid researchers to recognize natural medicine responsible for the anti-fertility effect.

Reference:

1. Greil, A.L., T.A. Leitko, and K.L. Porter, Infertility: His and hers. Gender & Society, 1988. 2(2): p. 172-199.
2. Zeidan, M.A.K., Body Mass Index Finding among a Sample of Women with Infertility in Baghdad City. kufa Journal for Nursing sciences, 2015. 5(3): p. 232-238.
3. Muscogiuri, G., et al., Shedding new light on female fertility: The role of vitamin D. Reviews in Endocrine and Metabolic Disorders, 2017. 18(3): p. 273-283.
4. Hanson, B., et al., Female infertility, infertility-associated diagnoses, and comorbidities: a review. Journal of assisted reproduction and genetics, 2017. 34(2): p. 167-177.
5. DeBenedectis, C., E. Ghosh, and E. Lazarus. Pitfalls in imaging of female infertility. in Seminars in roentgenology. 2015. Elsevier.
6. P, Rengaprabhu, Mosquito Auto Identification Scheme using Image Extraction Techniques (July 2, 2020). Journal of Science Technology and Research (JSTAR), Volume No.1, Issue No.1 (2020), Available at SSRN: https://ssrn.com/abstract=36426717.
7. Templeton, A.A. and G.C. Penney, The incidence, characteristics, and prognosis of patients whose infertility is unexplained. Fertility and Sterility, 1982. 37(2): p. 175-182.
8. Sharma, S., et al., Female infertility: an overview. International Journal of Pharmaceutical Sciences and Research, 2011. 2(1): p. 1.
9. Sudha, G. and K. Reddy, Causes of female infertility: A crosssectional study. International journal of latest research in science and technology, 2013. 2(6): p. 119-123.
10. Larsen, U., Primary and secondary infertility in sub-Saharan Africa. International Journal of epidemiology, 2000. 29(2): p. 285-291.
11. Karthick, R and Akram, Muhammad, Anti-Viral Medicinal Plants & Their Chemical Constituents, Experimental and Clinical Pharmacology of Antiviral Plants (June 21, 2020). Journal of Science Technology and Research (JSTAR), Volume No.1, Issue No.1 (2020), Available at SSRN: https://ssrn.com/abstract=3632133.
12. Nisolle, M. and J. Donnez, Peritoneal endometriosis, ovarian endometriosis, and adenomyotic nodules of the rectovaginal septum are three different entities. Fertility and Sterility, 1997. 68(4): p. 585-596.
13. FRANKS, S., Polycystic ovary syndrome: a changing perspective. Clinical endocrinology, 1989. 31(1): p. 87-120.
14. Barbosa, G., et al., Polycystic ovary syndrome (PCOS) and fertility. Open Journal of Endocrine and Metabolic Diseases, 2016. 6(01): p. 58.
15. Czeizel, A.E., J. Métneki, and I. Dudás, The effect of preconceptional multivitamin supplementation on fertility. International journal for vitamin and nutrition research, 1996. 66(1): p. 55-58.
16. Dhasarathan, N, Comparison of Various Multi-core Processor using FPGA (June 28, 2020). Journal of Science Technology and Research (JSTAR), Volume No.1, Issue No.1 (2020), Available at SSRN: https://ssrn.com/abstract=3640914.
17. Farquharson, R.G., E. Jauniaux, and N. Exalto, Updated and revised nomenclature for description of early pregnancy events. Human Reproduction, 2005. 20(11): p. 3008-3011.

18. Bricker, L. and R. Farquharson, Types of pregnancy loss in recurrent miscarriage: implications for research and clinical practice. Human Reproduction, 2002. 17(5): p. 1345-1350.
19. Ali, T.S., N. Sami, and A.K. Khuwaja, Are unhygienic practices during the menstrual, partum and postpartum periods risk factors for secondary infertility? Journal of health, population, and nutrition, 2007. 25(2): p. 189.
20. Martin Sahayaraj, J, A Novel Design of Microstrip Antenna for Wireless Applications (June 30, 2020). JSTAR Volume No.1, Issue No.1 (2020), Available at SSRN: https://ssrn.com/abstract=3640920.
21. Ried, K. and K. Stuart, Efficacy of Traditional Chinese Herbal Medicine in the management of female infertility: a systematic review. Complementary therapies in medicine, 2011. 19(6): p. 319-331.
22. Sengupta, P., Challenge of infertility: How protective the yoga therapy is? Ancient science of life, 2012. 32(1): p. 61.
23. Goldin, B.R., et al., Estrogen excretion patterns and plasma levels in vegetarian and omnivorous women. New England Journal of Medicine, 1982. 307(25): p. 1542-1547.
24. Thomas, A.J., Factors affecting the emergence times of seven sympatric insectivorous bat species. 2011.
25. Dervarics, C., National Service Act Becomes Law. 1993.
26. Triantaphyllidis, G., T. Abatzopoulos, and P. Sorgeloos, Review of the biogeography of the genus Artemia (Crustacea, Anostraca). Journal of biogeography, 1998. 25(2): p. 213-226.
27. Veal, L., Complementary therapy and infertility: an Icelandic perspective. Complementary Therapies in Nursing and Midwifery, 1998. 4(1): p. 3-6.
28. Valiani, M., et al., The effects of massage therapy on dysmenorrhea caused by endometriosis. Iranian journal of nursing and midwifery research, 2010. 15(4): p. 167.
29. Bullock, M., P. Culliton, and R. Olander, Controlled trial of Acupuncture for severe recidivist alcoholism. The Lancet, 1989. 333(8652): p. 1435-1439.
30. Gallinelli, A., et al., Genetics: Expression of pro-opiomelanocortin gene in human ovarian tissue. Human Reproduction, 1995. 10(5): p. 1085-1089.
31. Steiner, A.Z., M. Terplan, and R.J. Paulson, Comparison of tamoxifen and clomiphene citrate for ovulation induction: a meta-analysis. Human Reproduction, 2005. 20(6): p. 1511-1515.
32. Goh, S. and K. Loh, Gynaecomastia and the herbal tonic" Dong Quai". Singapore medical journal, 2001. 42(3): p. 115-116.
33. Roemheld-Hamm, B., Chasteberry. American family physician, 2005. 72(5): p. 821-824.
34. Lloyd, K.B. and L.B. Hornsby, Complementary and alternative medications for women's health issues. Nutrition in Clinical Practice, 2009. 24(5): p. 589-608.
35. Perry, T.E. and J. Hirshfeld-Cytron, Role of complementary and alternative medicine to achieve fertility in uninsured patients. Obstetrical & gynecological survey, 2013. 68(4): p. 305-311.
36. Rashid, B.M., T.J. Mahmoud, and B.F. Nore, Hormonal Study of Primary Infertile Women. Journal of Zankoy Sulaimani-Part A (JZS-A), 2013. 15(2): p. 137-142.