

## Acupuncture and Moxibustion Treatment for Infertility

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Infertility is defined as the inability to conceive despite normal sexual activity over a specific period of time. The duration varies from 3 years after marriage in Japan, 2 years in the International Society of Obstetrics and Gynecology, and one year in the American Fertility Society. Taking age into consideration, 2 years is considered appropriate for those over 30 years of age, and one year for those over 35 years of age. When a woman has never been pregnant, it is called primary infertility, and when she has been pregnant at least once and has been infertile since then, it is called secondary infertility. The usual tests include basal body temperature, hysterosalpingogram, ultrasound tomography, blood prolactin, the tumor marker CA125 (Cancer Antigen) level, sperm analysis, and laparoscopy. When these tests show no abnormalities, it is called unexplained infertility [1].

Infertility treatment is widely studied not only in Western medicine but also in Oriental medicine. In A-B Classic of Acupuncture and Moxibustion, KI2 is used for a woman who has enough water and blood but fails to conceive [2]. In Valuable Records on Acupuncture and Moxibus-

tion, CV3 or BL23 and GV4 are used for infertility. For a woman who are prone to miscarriage, moxibustion at CV8 will not cause miscarriage for a long time [3]. The infertility may be improved by acupuncture and moxibustion treatment and pregnancy may occur if the infertility is occurred due to the stunted of uterus, uterine malposition, cold, or other constitutional abnormality. Treatment points for both acupuncture and moxibustion are BL23, BL27, BL31 or BL53, CV12, CV6 or ST27, ST36, KI3. For BL23 and BL27, the needle is placed [2]. In moxibustion style of Chujyouryu, a triangle is formed between the lower border of the nasal septum and the corner of the mouth, the apex of which is placed on the navel, and moxibustion of 30 times is applied to both corners of the lower border for 2 to 6 months [4].

Infertility has many possible causes and is classified variously in terms of functional and organic causes. Infertility is increasingly caused for men as well as women. It is also influenced by social factors such as declining reproductive rates, rising rates of unmarried women, and older age of childbearing. The number of

elderly births aged 35 and over increases. This is due to the trend toward later marriage and later childbearing, which is associated with lifestyle changes such as more highly educated women and increased employment rates. This is also due to advances in assisted reproductive medicine. In 2014, 39 thousand per 1 million total births were assisted reproductive births, such as in-vitro fertilization and intra-cytoplasmic sperm injection, the ratio of 3.9% is increasing [5].

Infertility treatment consists first of general infertility treatment, followed by advanced infertility treatment. General infertility treatment includes the timing method and artificial insemination. In the timing method, intercourse is synchronized from 2 days prior to the day of ovulation to the day of ovulation, in the period conception is most likely to occur. If a woman does not conceive at least six times, the subsequent pregnancy rate will stagnate, so the standard is six times. In artificial insemination, the fertile sperm are extracted from the collected semen, concentrated, and injected directly into the uterus at a time when conception is most likely to occur. The process of achieving pregnancy is the same as that of natural conception. The probability of conception through artificial insemination is approximately 10% per cycle. The cost ranges from 200 to 300 US\$. General fertility treatment also includes drug therapy to stimulate the ovaries to ovulate with oral medications or injections of ovulation inducing drugs, and surgical treatment for endometriosis and other conditions [6]. Advanced Reproductive Technology (ART) includes ovum retrieval, in which ova are extracted from the ovaries, and embryo

transfer, in which an ovum and sperm are fertilized outside the body and the fertilized ovum is returned to the uterus a few days later. The probability of childbirth with ART averages 12% per total number of the treatment. The rate declines with age, about 20% until the age of 32, and 7 to 8% after the age of 40. The cost ranges from 3 thousand to 6 thousand US\$ for both [7].

Clinical reports of acupuncture and moxibustion treatment in the literature are shown as follows [8, 9]. For acupuncture treatment, CV3, CV4, SP6, and SP10 are primary points. CV6, GV20, BL23, BL52, BL31 to BL34, ST36 and SP9 are added depending on the situation. For moxibustion treatment, CV3 and CV4 are primary points, ST36 and SP6 are added. If moxa is done after acupuncture, CV4 and CV7, or CV3, CV4, ST36, and SP6 are selected. SP6 and CV4 or Ex-CA1 and ST25 are also available. For warm moxa treatment, CV3, CV4, CV8, GV4, SP6 are primary points, and CV6, BL43, BL18, BL23, and ST36 are added. 3 to 5 points are selected and performed daily or every other day for 10 to 20 minutes. In Extraordinary meridian therapy, such as an ion pumping therapy, PC6 and SP4, or SI3 and BL62 are selected. In auricular acupuncture, uterus point, ovarian point, subcortical point, shenmen, adrenal point, kidney point, and endocrine point are selected. The acupuncture and moxibustion points are listed in order of most reported cases. In 12 classic treatment, the order is CV3, CV4, KI1, KI2, ST30, GV4, BL23, BL21, SP5, and ST28. In 30 modern treatment, the order is BL23, CV3, CV6, BL31, CV12, GV4, BL32, SP6, ST27, and ST36.

The issues that must be resolved for pregnancy include improving the quality of the ovum, promoting follicle development, improving the condition of the uterus, and achieving immunologic tolerance. The issues that must be resolved to maintain pregnancy include improving the quality of placental neovascularization, preventing gestational hypertension, maintaining luteal function by improving ovarian function, and improving blood circulation. In improving the quality of ovum, improvement of menstrual cycle by acupuncture treatment [10] and acupuncture treatment of anovulatory cycles [11] were reported. In the promotion of follicle development, the improvement of condition of ovum by acupuncture and moxibustion treatment are reported [12]. Irradiating linear polarized near-infrared light (LPNIR) deeply into the body increases blood flow and enables ovum development. The case when LPNIR was used for acupuncture and moxibustion treatment as well as infertility treatment was also reported [13]. In the improve of the condition of the uterus, the smooth muscle and blood flow of the uterus were significantly altered by the autonomic nervous system. Somatosensory stimulation applied to the skin was also shown to control uterine movement and blood flow via the autonomic nervous system [14]. In the amelioration of chromosomal abnormalities, increase of the blastocyst probability to 70% by LPNIR to the stellate ganglia was reported [15]. It was thought that the blastocyst probability increased due to an increase in the number of ovum without chromosomal abnormalities. In terms of improvement in implantation rate, acupuncture and moxibustion treatment significantly improved the implanta-

tion rate of blastocysts in patients under 40 years of age. In ART, patients 43 and 45 years old also became pregnant. A treatment period of 3 to 4 months was required. Anti-Müllerian hormone was increased. It was thought that acupuncture and moxibustion treatment improved blood circulation in the ovaries and restored closed follicles [16]. Successful pregnancies in ART patients were also reported with acupuncture and moxibustion treatment on Ex-CA1, SP10, and SP6 [17]. In improving blood flow in the ovarian artery, warm moxa treatment improved blood flow in the ovarian artery, proper ligament of ovary, and uterine fundus [15]. In the relationship between infertility and cold-constitution, acupuncture and moxibustion treatment was reported to improve cold-constitution caused by vasomotor neuropathy in infertile patients [18]. The effect of acupuncture treatment on mental stress in infertile women was reported [19]. Both state and trait anxiety were improved by acupuncture treatment. Minor problems associated with menstrual pain, uterine fibroids, ovarian hyperstimulation syndrome, and endometriosis are also expected to be resolved. Recent report of acupuncture treatments for infertility selected SP6, SP9, SP10, BL23, BL52, and BL33 with placed needles or low-frequency electrical acupuncture (LFEA) [15]. Acupuncture treatment at BL33 was used to improve blood flow in the ovarian arteries and to cure the endometrium. Press needles were applied to assist implantation and to maintain pregnancy. As a general infertility treatment for men, acupuncture treatment for infertility due to male oligospermia was also reported [20].

In discussion, the importance of clarifying based on the findings of Western medicine, that acupuncture treatment for infertility patients or pregnant women is both safe and effective are explained. In Oriental medicine, there is pulse and tongue diagnosis. These diagnosis were systematized at a time when hormones, autonomic nerves, immunity, etc. were not well known. Today, the situation has changed from that indicated in classical Oriental medicine. For example, there is no situation where acupuncture or moxibustion should not be done on SP6 during pregnancy, as indicated in the classics. It is now said that acupuncture and moxibustion treatment on SP6 during pregnancy does not cause miscarriage. Moxibustion treatment on SP6 has been recommended for pregnant women in the stable period as the moxibustion for safe delivery. There is a report that on the SP6 of patient who experienced a miscarriage did not have a miscarriage after electric pulse stimulation, which is more stimulating than the ordinary acupuncture. Discussion among researchers in Oriental medicine needs to be encouraged to clarify the effects of acupuncture and moxibustion on infertility patients and pregnant women. It is also necessary to construct a theory to make acupuncture and moxibustion a medical science rather than an art. Repeatability is also important to verify the constructed theory, so it is necessary to verify it as an integrative medicine that includes Western medicine as well. The causes of infertility are diverse, and the pathological conditions of all patients are different. In the case of artificial insemination, the concept of miscarriage is difficult to understand. In the case of artificial insemination, an ovum

that would not normally be nurtured is placed in the uterus, and as a result, the miscarriage rate may have increased. So, the homogeneous treatment will not be effective. Oriental medicine tailors treatment to each individual patient. By understanding the patient's condition in detail, the suitability of Oriental medicine for infertility treatment is considered to be higher than in Western medicine. The selection of highly effective acupuncture and moxibustion treatment methods is essential for further improvement of suitability in Oriental medicine. In addition, for childbirth, it is important not only to conceive but also to maintain pregnancy. Since hormones from the ovaries also act to maintain pregnancy, treatment of the ovaries and other parts of the body is considered important even after pregnancy.

It is also important to identify diseases that cannot be recovered by acupuncture and moxibustion treatment. For example, fallopian tube obstruction cannot be recovered by acupuncture and moxibustion treatment. Even if the obstetrician says that the baby is breech, in one-third of cases, the baby is not breech. If it is not breech, there is no need for acupuncture treatment. Acupuncture clinics also need to introduce ultrasound imaging technology to improve the accuracy of examinations. If acupuncture treatment is more effective, efforts should be made to deliver the baby. On the other hand, acupuncture treatment for incompatible cases or cases that do not require treatment should be discouraged. This will require improvement in the accuracy of medical interviews and examinations.

From the viewpoint of confirming the effectiveness of acupuncture and moxibustion treatment, the pregnancy rate is important. If the pregnancy rate is high, it is possible to prevent patients from staying at the acupuncture clinic and to treat new patients with acupuncture and moxibustion. If the pregnancy rate is low, the clinic will not be able to accept new patients and the pregnancy rate will decrease, then negative feedback takes place. The accuracy of medical interviews and treatment techniques need to be improved, and the target pregnancy rate should be set at around 70%. High treatment costs will reduce the retention rate. The reduction of retention rate causes a shortage of data. The shortage of data creates a vicious cycle in which therapeutic effects do not improve and the number of patients decreases. In order to achieve the goal of 3 months or more of continuous acupuncture treatment, it is necessary to set a commonsensible treatment cost.

In summary, infertility treatment has been widely studied in Oriental as well as Western medicine. It is mentioned in the classics such as A-B Classic of Acupuncture and Moxibustion and Valuable Records on Acupuncture and Moxibustion. Infertility has many possible causes and can be classified variously in terms. Some are social factors, such as rising rates of unmarried women and older age of childbearing. Infertility treatment in order to realize pregnancy includes improving the quality of the ovum and condition of the uterus, promoting follicle development, and achieving immunologic tolerance. In order to maintain pregnancy, it is important to improve the quality of pla-

cental neovascularization, ovarian function, and blood circulation, and to prevent gestational hypertension. Acupuncture and moxibustion treatment to the stellate ganglia and ovarian artery is expected to improve the pregnancy rate. LPNIR is effective and warm moxa treatment is good for improving blood flow. Acupuncture and moxibustion treatment is effective for infertile women having mental stress as well as minor problems. Treatment points for acupuncture and moxibustion treatment are SP6, SP9, SP10, BL23, BL52, and BL33 using placed needles or LFEA. Press needles are also good to maintain pregnancy. Oriental medicine tailors treatment to each individual patient. Understanding of the patient's condition in detail is higher suitability of Oriental medicine for infertility treatment. For further improvement of suitability, it is important to select highly effective treatment methods, introduce ultrasound imaging technology, improve pregnancy rate, and set a commonsensible treatment cost.

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