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UNVEILING THE SIDDHA HERBO-MINERAL FORMULATION FOR STERILITY- A LITERATURE REVIEW

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ABSTRACT: In recent days some groups are seeking infertility treatment, on the other hand there are groups seeking contraception methods. Nowadays there are several ways are available for contraception such are Oral contraceptive pills, implants, injectable, patches, rings, intra uterine devices, Male and Female sterilization and so on. WHO stated that the number of women desiring to use family planning has increased markedly over the past two decades from 900 million in year 2000 and 1.1 billion in the year 2021. Between 2000 to 2020 the contraceptive prevalence rate increased from 47.7 to 49%. WHO assists countries to adapt and implement contraception tools to strengthen contraceptive policies and programs. Siddhars, who were the founders of Siddha Medicine. From their insights they told lot of medicines for all health ailments. Even for disease prevention, diagnosis and to cure the disease. Siddha literature evidenced that the natural contraception method by using herbal drugs which would be effective. *Poovarasan* (*Thespesia populnea*) tree bark, *Induppu* (Rock or pink salt) and *Kaaichukatti* (Acacia catechu) taken as same quantity, then dried and powdered. Siddha literature suggests that this powder to be taken from the first five days of the menstrual cycle. The siddha literature evidenced that the women will be sterilized until her entire reproductive age. This literature review aims to validate the efficacy of medicine in its contraceptional activity.

INTRODUCTION: *Siddha* system of medicine is in medieval medicine which was pioneered by *Siddhar's*. *Siddhar's* are a person who achieved the supernatural power like *Astamasiddigal (Anima, Mahima, Lagima, Karima, Prapthi, Pragamiyam, Isathuvam, Vasithuvam)* through the practice of *Astanga yogam (Iyyamam, Niyamam, Asanam, Pranayamam, Prathiyagaram, Tharanai, Thiyanam and Samathi)* [1].

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Siddha literature categories the disease into *Vatham*, *Pitha* and *Kabam*. So, finally they arrived with 4448 diseases. They not just treat diseases but also prevent diseases. The *Siddha* literature suggested several information regarding women welfare. One such thing would be in their reproductive age, that is fertility and fertility control (sterility).

In recent days there are several groups of infertility treatment such as *in-vitro* Fertilization (IVF), Intra Uterine Insemination (IUI), Intracytoplasmic Sperm Injection (ICSI), Gamete Intra Fallopian Transfer (GIFT), Zygote Intra Fallopian Transfer (ZIFT) and hormonal therapies [3, 4]. Nevertheless there are group of peoples searching for contraception that is birth control. One of the

Siddha Literature *(Vaithiya perungkural)* stated a simple combination of medicine for contraception through oral administration. *Poovarasan* (*Thespesia populnea*) tree bark, *Induppu* (Rock or pink salt) and *Kaaichukatti* (Acacia catechu) which is efficiently available. This literature review aims to validate the efficacy of medicine in its contraceptional activity [5].

Literature Review: *"Poovarasan pattai indhupunkasukattisaman Naavurape nnunna Maladam" Kaikanda anuboga Vaidhya perungkural* [5]. *Poovarasu Pattai* (Stem bark of *Thespesia populnea*), *Indhuppu* (Rock salt or Himalayan salt) and *Kasukatti* (Acacia catechu) has taken as equal ratio. All the ingredients are pounded and strained through a piece of soft cloth. This medicine is advised to be taken at the time of first five days of menstrual cycle.

Route of Administration: Oral [5]

Dosage: *Verukadi Pramanam* (Volumetric equivalent to cat foot) [6].

In India, sterilisation is the most frequent method of modern contraception and is primarily used by women. The contemporaneous assessment of sterilisation literature focuses only on trends and patterns that are limited to socioeconomic considerations, ignoring the cohort and period issues. Sterilization was part of the earlier family planning programme but during the emergency period (1974–79) [7, 8].

Action of Sterility Drugs: Progesterone is primarily responsible for preventing pregnancy. The primary mechanism of action is the prevention of ovulation; they inhibit follicular development and prevent ovulation. Progestogen-negative feedback works at the hypothalamus to decrease the pulse frequency of the gonadotropin-releasing hormone. This, in turn, will reduce follicle-stimulating hormone (FSH) secretion and decrease luteinizing hormone (LH). If the follicle isn't developing, an increase in the oestradiol levels (the follicle makes oestradiol) does not occur. The progestogen-negative feedback and lack of oestrogen-positive feedback on LH secretion stop the mid-cycle LH surge. Ovulation is prevented when no follicle develops, and no LH surge occurs to release the follicle [9]. Estrogen has some effect on inhibiting follicular development because of the negative feedback on the anterior pituitary with slowed FSH secretion; it is just not as prominent as progesterone's effect. Another primary mechanism of action is progesterone's ability to inhibit sperm from penetrating through the cervix and upper genital tract by making the cervical mucous unfriendly. Progesterone induced endometrial atrophy should deter implantation [9].

The antifertility effect observed in many nonruminant species is overshadowed by toxic effects, particularly in females [10].

The most commonly prescribed pill is the combined hormonal pill with estrogen and progesterone. Progesterone is the hormone that prevents pregnancy, and the estrogen component controls menstrual bleeding. Birth control pills are widely used to avoid pregnancy. However, given their side effects in populations at risk, several other methods of contraception [11].

Oral contraceptive pills (OCPs) are either combined estrogen-progesterone (also called combined oral contraceptive pill-COC) or progesterone-only pill (POP) [11].

The most commonly prescribed pill is the COC pill. Progesterone is the hormone that prevents pregnancy, and the estrogen component controls menstrual bleeding. Birth control pills are primarily used to avoid pregnancy. The type of medicine used estimates the effectiveness of these oral contraceptive medicines [11].

Thespesia populnea (*Poovarasu pattai*) Bark: *Thespesia populnea* bark consists of a phytochemical compound named as gossypol. Gossypol seems to disrupt oestrous cycles, pregnancy, and early embryo development in females of all nonruminant species. Probable mechanisms include an endocrine effect on the ovary as well as a cytotoxic effect on the uterus or embryo [12].

The chemical gossypol activates the anti-fertility activity in rats and hamsters. It also contains antiestrogenic properties that inhibit the activation of estrogen and receptors, thereby blocking the transcription process. It includes non-strogen antiestrogen that interfere with hormones

recognition and pure antiestrogens with long side chains that prevent receptor binding to DNA. The bark and flower possess astringent hepatoprotective antioxidant and anti-inflammatory activity in rats. Gossypol was found to be the major compound of T.P producing anti-fertility effects in rats as well as in human being. The compound is isolated from the tree, was screened for postcoitus anti implantation activity on fertile female albino rats. Gossypol acetic acid was administrated orally. It has a antifertility effect in the female rate because it is luteolytic [13].

The nature and significance of the ultrastructural changes of the endometrium induced by gossypol were analysed and the possibility of developing a new field of research in female contraception with gossypol was considered [14].

The supplement of a combination of exogenous progesterone and estradiol 17β eliminated the inhibitory effects of gossypol on ovum implantation and the maintenance of pregnancy. Our results indicate that gossypol may have some usefulness in female fertility control [15].

Gossypol was also tested in the female for effects on ovulation and pregnancy. Gossypol did not inhibit ovulation in the rat at dosages up to 80 mg/kg/day but did cause 90% inhibition of pregnancy in mice treated with 80 mg/kg/day during the first two weeks of pregnancy [16].

Acacia catechu (*Kaaichukatti*): In rural Bangladesh as component of antifertility pill, arresting nose bleeds, chronic gonorrhea can be treated with an infusion of Acacia catechu [17].

Rock Salt or Himalayan Salt (*Indhuppu*): High saline produces a fewer number in developing follicles and oocytes, and thus induce infertility in females which indicates the addition of *Indhuppu* [18].

***Siddha* Literature:** *Siddha* literature stated that the part of the reproductive organs and cells were compared with *Panjabootha (Aakayam*- Space, *Prithi*- land, *Neruppu*- fire, *Vaayu*- air *and Neer*-water*)* theory. As it mentioned *Aakaya bootham* is compared with Uterus (*Karuppai*), which gives enough space to the growth of the foetus. *Prithvi bootham* is compared with Ovum (*Naatham),* where it commences the formation of zygote. *Sukkilam* (Sperm) is compared with both *Neruppu* (fire) and *Vaayu* (air), so that, it can move like an air and enter into the ovum like a fire. *Neer bootham* is compared with nutrients which was supplied by blood or nutrients which was supplied by the amniotic fluid [2].

Based on the *Siddha* literature every plant has it own property like *Suvai (*taste), *Gunam* (Character) and *Pirivu* (Post absorption state). Based on this taste, character and Post absorption state the medicine is prescribed for the diseases [19].

***Poovarasu* (Thespesia populnea):** Properties of the Poovarasu.

Taste: *Kaippu* (bitter) & *Thuvarppu* (Astringent)

Character: Veppam (hot)

Post Absorption State: *Kaarppu* (Spicy) [20]

***Kaaichu Katti* (Acacia catechu):** Properties of the *Kaaichukatti*.

Taste: *Thuvarppu* (Astringent)

Post Absorption State: *Kaarppu* (Spicy) [20]

Contraindication of having Much Spicy (*Kaarpu)* Food: *Naavaratchi* -Dryness of mouth (Xerostomia), *Sukkilakedu* – dysfunction or destruction of both sperm and ovum, *Nadukkam* – increases tremor and *iduppu & Mudhugu vali*- Pain in the hip and lower back region [19].

Contraindication of having Much Astringent (*Thuvarppu)* Food: *Naavaratchi* -Dryness of mouth (Xerostomia), *Sukkila kedu* – dysfunction or destruction of both sperm and ovum, *Nadukkam* – increases tremor, *maarbu vali*- Chest pain, *Ratha naala churukkam* (Vasoconstriction activity), *Aanmaikuraivu* (Sterility activity) and *iduppu & Mudhugu vali*- Pain in the hip and lower back region [19].

Contraindication of having Much *Kaippu* (bitter) Food: *Naavaratchi* -Dryness of mouth (Xerostomia), *Sukkila kedu* – dysfunction or destruction of both sperm and ovum, *Nadukkam* – increases tremor and *iduppu & Mudhugu vali*- Pain in the hip and lower back region [19].

The Spicy (Kaarpu), astringent (Thuvarppu) and *Kaippu* (bitter) has the ability to increases the Vaatham [19]. When Vaatham humour increases it reduces the S*ukkilam* (Sperm and ovum). So that it may induces the sterility [21].

Indhuppu: "Senni kannapatrursevikalk and ampasunoi

Sanniyasam: *Kaasamthaagammirappunniratha Moolamsilanthinalimoodikarunjsoothaivali, Soolanjsithaiyumminthaar sol* [22].

Sanniyasam: Asceticism consisting in renouncing all worldly affections and possessions with a view to work out for salvation, it is one of the four stages and the last stage of the religious act contemplated in a man's life.

DISCUSSION: In the present literature review emphasize that the siddha herbo-mineral formulation indicated for sterility which constitutes *Poovarasam (Thespesia populnea)* bark, *Kasukatti or Kaaichukatti (Acacia catechu)* and *Indhuppu (Himalayan rock salt)*. The significant phytochemical present in *Thespesia populnea (poovarasam)* bark is gossypol. In seems to be very potent in inducing sterility activity several articles revealed that it has antiestrogenic activity, anti-implantation activity and anti-ovulatory activity.

Regarding *Acacia catechu*, it has been used in antifertility pills. High salinity of *Indhuppu (Himalayan rock salt)* also have the effect over the developing follicles by disrupting the development of oocytes, *Siddha* literature evidence in that the drug constituting in this formulation have the *Kaarpupirivu* (post absorption state) and *Thuvarppu* taste (Astringent) and *Kaippu* taste, which have effect over the sterility activity.

CONCLUSION: In conclusion, this review aims to summarize that sterility action. Many articles revealed that it has the potential anti fertility activity. Further research is required to discover the antifertility action. In vivo model using rats and mice could strengthen their role.

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