



Concept of Infertility among Obese Women in Unani System of Medicine-A Review

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Abstract

Obesity represents a rapidly growing threat to the health of populations which has detrimental effect on fertility by disrupting the neuroendocrinal and ovulatory functions. One quarter of all obese infertile couples have an ovulatory disorder and 90% of those women with an ovulatory disorder have PCOD. Obese infertile women are at risk of type 2 diabetes mellitus, endometrial and breast cancer. Recent studies have shown that, obese women require higher doses of ovulation inducing drugs and has poor outcome with ART. These interventions are also associated with complications such as ovarian hyper stimulation syndrome, reduce ovarian reserve and pelvic adhesions. In Unani system of medicine, infertility is termed as “*Uqr*” which occurs due to defect in male *mani* (sperm) or female *mani* (ovum) or male and female reproductive organs. It is mentioned in various Unani literature that obesity is associated with infertility. Obesity (*siman mufrit*) is classified as a *balghami marz* which leads to *zoa'fe jigar, sudda jigar, sue mizaj sada (barid ratab)* and *sue mizaj maddi (balghami)* of the uterus, *zo'afequwwate tawlidi mani* which alter the ovarian function which results in impaired follicle development and *toole ihtebase mani* (chronic anovulation); these factors are responsible for infertility. Principle of treatment includes elimination of cause of infertility (obesity), use of *mudirre haiz* *advia* having *mufattih sudad* property to induce menstruation, use of *muwallide mani, muqawwi rahim & mu'ine hamladvia* to help in conception. This review gives a complete description of physiology of reproduction, effect of obesity on fertility, diagnosis, principle of treatment and treatment in Unani perspective.

Key words: Infertility, Obesity, PCOD, *Uqr*, *Siman Mufrit*.

Introduction:

Infertility affects approximately one in six couples during their lifetime.¹ In 2010, an estimated 45-52.6 million couples were infertile globally.² The prevalence of obesity and overweight are increasing and become an epidemic because of sedentary lifestyle which includes reduced physical activity, changes in nutrition style, and an increased calorie intake.³ Obesity has detrimental influences on all systems, including reproductive health.⁴ Obese women are three times more likely to suffer from infertility than the women with normal body mass index and may take longer time to conceive. Probability of pregnancy is reduced by 5%

per unit of BMI exceeding 29 kg/m².³ One quarter of all obese infertile couples have an ovulatory disorder⁵ and 90% of those women with an ovulatory disorder have PCOS.⁶ Prevalence of obesity in PCOS ranging from 35% to 63%.¹ In classical Unani literature, infertility is termed as “*Uqr*” which occurs due to defect in male *mani* (sperm) or female *mani* (ovum) or male and female reproductive organs.^{7,8,9,10} It is mentioned in various Unani literature that obesity is associated with infertility.^{7,11} Unani physicians have given a well-established correlation between visceral obesity (deposition of fat on omentum),^{12,13} amenorrhoea, infertility & hirsutism which can be correlated with polycystic ovarian disease.^{9,11} Recent studies have shown that, obese women require higher doses of ovulation inducing drugs and has poor outcome with ART.⁶ Unfortunately, pharmacological treatment of obesity despite short-term benefits are often associated with rebound weight gain after the cessation of drug use, side effects of medication and the potential for drug abuse.¹⁴ These pharmacological and surgical interventions are associated with complications such as ovarian hyper stimulation syndrome,¹⁵ reduce ovarian reserve and pelvic adhesions.¹⁶ In Unani system of medicine plenty of single drugs and compound formulations are available for the treatment of infertility in obese women with no such side effects.

Historical background:

1. Kahun Papyrus (2200-1950 BC) is the world oldest medical text describes gynaecological diseases, methods used for the detection of fertility and 17 prescriptions for infertility.^{17,18}
2. The ancient Egyptians describe infertility as a disruption in the continuity between the reproductive organs and digestive tract and diagnosis was made on physical examination.
3. Hippocrates (460-377 BC) mentioned, “women whose menstruation is less than three days or is meager, robust, with a healthy complexion and a masculine appearance; they will not become pregnant.” He was aware of connection between oligomenorrhoea, obesity, hirsutism and infertility.
4. Soranus of Ephesus (98-138 AD) observed that “sometimes it is also natural not to menstruate at all...It is natural too in persons whose bodies are of a masculine type... we observe that the majority of those not menstruating are rather robust, like mannish and sterile women” This statement is suggestive of PCOS (amenorrhoea, obesity, hirsutism and infertility).⁸
5. Rofas (98-171AD) mentioned that obese women fail to conceive due to dominance of *khilt balgham*, even if they conceive risk of abortion or difficult labour is associated with them.⁹
11,13
6. Ibn Sina (980-1037AD) mentioned in his treatise that obese women could not conceive easily, even if they conceive there is high risk of abortion.⁸
7. Majoosi (930-994 AD) mentioned that if temperament of women becomes cold, it causes *zo'afe jigar* as a result liver is unable to convert chyme into blood, in its place convert it into tenacious phlegm which is the major cause of amenorrhoea. Obesity causes *zo'afe jigar* and excessive production of *phlegm* which causes narrowing of blood vessels and reduces blood supply to the uterus leading to amenorrhoea and infertility.⁷
8. J. Lisfranc (1830) first described polycystic ovaries.¹⁷
9. Achard and Theirs (1921) gave the first description of the relationship between androgen excess in women and disturbance in carbohydrate metabolism, highlighting the presence of polycystic ovaries.²⁰
10. Irving Stein and Michael Leventhal (1935) published a case series of 7 women with amenorrhoea, hirsutism and bilateral polycystic ovaries, a condition that later came to be known as polycystic ovary syndrome.^{17,21}
11. Stein (1945) defined the syndrome of oligomenorrhoea, hirsutism & infertility as polycystic ovaries and Dr. Jo. V. Meigs (1949) used the term Stein-Leventhal syndrome.
12. Lewis *et al* (1950) mentioned a relationship between androgens and insulin secretion.

13. Keetel *et al* (1957) noted increased concentration of androgens and LH in women with polycystic ovaries.¹⁷

14. Yen *et al* (1970) noted that hyper secretion of LH and an increased LH:FSH ratio has been demonstrated to be unfavorable for folliculogenesis; both conditions can be observed in obese infertile patients.

15. Hackl (1973) reported that insulin has been implicated in regulation of endometrial development and receptivity. Hence, insulin resistance would affect fertility.²²

16. Hartz *et al* (1979) mentioned that obese women are at increased risk of menstrual disturbances, including long cycle length (usually defined as >35 days) and anovulation. He has shown that childhood obesity is associated with reduced fecundity in married women, suggesting the association between obesity and fecundity.^{22,23} Anovulatory cycles, oligomenorrhoea and hirsutism were higher in obese than normal-weight women.

Physiology of reproduction:

According to Unani concept each and every organ is furnished with power, *Quwat* (faculty), through which specific physiological functions are performed by that particular organ. There are three major division of *quwa* (faculties) of the body.

1. *Al-quwa al-Tabi'yah* (Natural faculties)

2. *Al-quwa al-Nafsaniyah* (Psychic/ mental faculties)

3. *Al quwa al- haywaniyah* (vital faculties)

Al-quwa al-Tabi'yah serves the functions of nutrition, growth, and reproduction in the body, for the preservation of individual as well as species. *Quwa-e-tanasulliyah* (reproductive faculties) are one of its types which act on *ghiza* (food) for the preservation of species. It is responsible for the generation of *mani* i.e (sperm and ovum), all sexual functions and formation of the foetus in the uterus.

Quwa-e-tanasulliyah is of two types:^{10,24,25}

1- Al quwa al muwallida (Generative faculty):

This *quwa* separates the essence of *mani* from *imshaj badan* (body constituents) inside the testis and ovary and makes each part of it to become a particular organ.^{24,25} Thus, this faculty controls oogenesis, ovulation and menstruation with the help of different *akhlatemuharrika* (hormones).

2- Al quwa al musawwira (Formative faculty):

This *quwa* gives shape to each part of *mani* (sperm and ovum) which is required by that particular species to which *manibelongs*. Thus, this faculty controls fertilization of ovum, implantation, cleavage and differentiation of embryo, formation of fetal membranes, fetal growth and development.²⁴

Rahim (Uterus): Ibn Rushd states that *Rahim* performs two important functions:

1. Child birth

2. Excretion of menstrual blood²⁶

Rahim consists of four types of *quwa* (faculties), weakness of it causes infertility:

Table No.1: Descriptions of *Quwa* (faculties)of *Rahim*

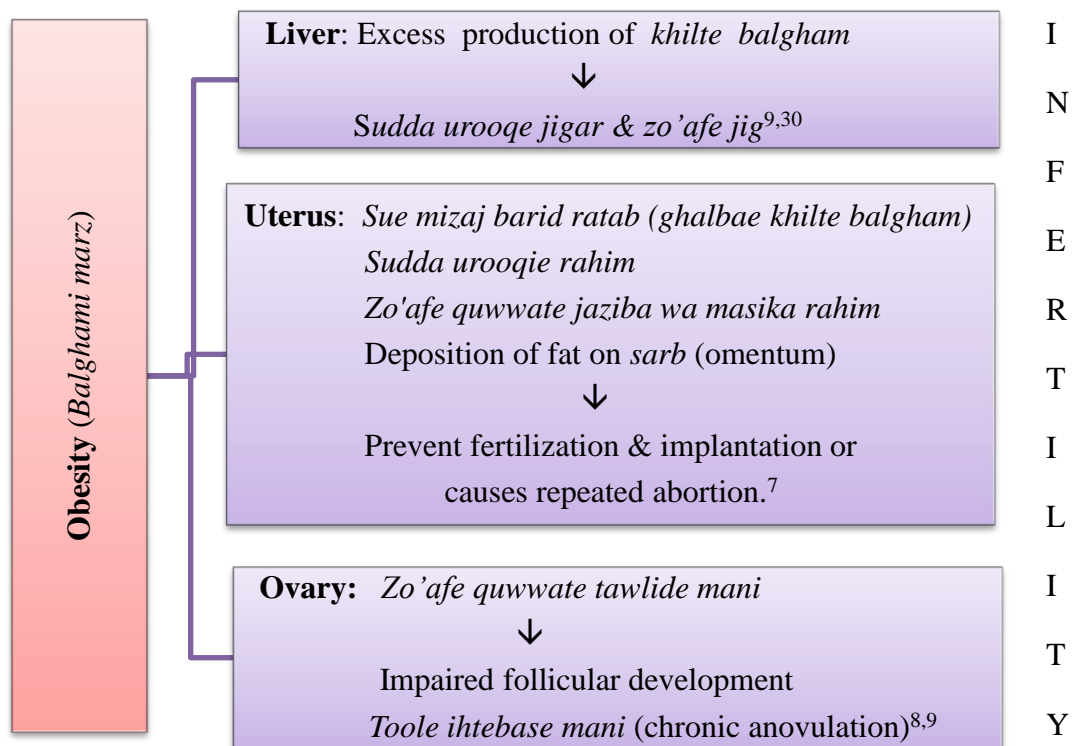
<i>Quwwate jaziba</i>	<ul style="list-style-type: none"> • It absorbs the <i>nutfa</i> (gametes) and its weakness causes infertility.²⁴
<i>Quwwate masika</i>	<ul style="list-style-type: none"> •It retains the foetus with in the uterus till labour by implanting it to the uterine wall and firm closure of uterine os. •Accumulation of excessive <i>rutubat</i> (fluid) in the uterus causes <i>zo'afe quwwate masika</i> leading to abortion.^{11,13,24}
<i>Quwwate hafiza</i>	<ul style="list-style-type: none"> •It protects the fetus. •<i>Sue mizaj barid</i> causes <i>zo'afe quwwate hafiza</i> which leads to infertility.²⁶
<i>Quwwate dafi'a</i>	<ul style="list-style-type: none"> •It expels out the fetus during labour and its weakness causes dystocia.²⁴

Etiopathogenesis:

Siman mufrit (Obesity):Unani system is a comprehensive medical system, which meticulously deals with the state of health and disease. Unique holistic approach of Unani medicine is its seven fundamental principles which make up the totality of human being i.e *Arkan, Mizaj, Akhlat, A'za, Arwah, Quwa* and *Af'al*. Health can be preserved and maintained as long as the overall quality of humours is in harmony with overall quality of temperament of the individual.

Hippocrate states that the main cause of the disease is impairment of humors owing to lifestyle disorders.²⁷ *Siman mufrit* is defined as excessive fat deposition in the body due to increase *burudat* and *rutubat* caused by excessive intake of fatty food, cold items in diet^{13,28} such as cold drinks, cold medicines;²⁹ sedentary lifestyle,¹³ rest,⁶¹ excessive sleep, moderate degree of pleasure, *hammam* & sleep particularly after meals etc.¹³ All these factors are responsible not only for the production of excess amount of *balgham*, but also for excessive fat deposition in the body resulting in obesity.^{7,8} Hence, *siman mufrit* is classified as a *balghami marz*^{12,13} in which *hararateghareeziyya* (inherent heat) is enormously compromised due to excessive coldness causing vasoconstriction which substantially hinders propagations of *rooh* (oxygen) to the organs.^{8,28} Rabban Tabri states that infertility is a complication of obesity. Impacts of obesity on female fertility in view of Unani system of medicine are described below:

Table.No.2: Etiopathogenesis of infertility among obese women



Effect of obesity on liver: Unani physicians mentioned that digestion of food occur in four stages: *hazme me'di wa me'wi*, *hazme kabidi*, *hazme urooqi* and *hazme uzwi*. Al Majoosi cited that excess amount of thick, cold and moist food causes *fasade hazme kabidi*,²⁹ as excessive chyme absorbs from the intestine reaches to the liver; which is unable to convert it into blood, instead it convert it into phlegm.⁷ This thick and viscous phlegm in turn causes *sudda urooqe jigar*^{9,30} and *zo'afe jigar*,¹⁹ which may result in amenorrhoea and infertility.^{8,12,31}

Effect of obesity on uterus: Ibn Rushd states that any alteration in shape, size, position and consistency of uterus may leads to diseases of uterus.²⁶

1. The quality, quantity and timing of food are important for the production of humours and maintenance of normal temperament of uterus, which get alter in obese women resulting in production of abnormal humors which in turn causes infertility.^{11,26}

2. In obese women, *zo'afe quwwate hazima* causes production of abnormal humour (*ghaliz khilt*) leading to *sudda jigar* and *zo'afe jigar*,⁸ which in turn causes abnormal temperament of liver (from hot and moist to cold and moist), as a result all those organs which receive this *balghami khoon* becomes cold and moist in temperament similar to that of *balgham*. Even the temperament of uterus changes to cold and moist²⁶ which is not suitable for conception. Hence, obesity results in *sue mizaj sada (barid ratab)* and *sue mizaj maddi (balghami)* of the uterus.

Sue mizaj barid: It causes uterine vasoconstriction⁹ (which leads to amenorrhoea)^{8,9,11,31,32} & spasm of fallopian tubes so that *nutf*a (gamete) fails to reach the uterus, if it reaches fails to grow further due to placental insufficiency caused by uterine vasoconstriction⁷ which ultimately leads to infertility.^{7,8,10,33}

Sue mizaj ratab: Ibn Sinastates that *sue mizaj ratab* results in infertility due to *zo'afe quwwate jaziba* and *masika* of uterus, which leads to decrease endometrial receptivity and failure of embryonic implantation.^{7,8,12,31,32,33}

Sue mizaj maddi: Al Majoosi cited that *ghalbae balgham*, *safra* or *sawda* causes infertility, but in obese women, infertility mainly occurs due to dominance of *khilte balgham*.^{7,13}

Fat deposition on *sarb*: Al Majoosi and Ibn Sina states, 'obesity as the cause of infertility'. In obese women, excessive fat deposition on *sarb* (omentum)^{12,13} not only causes pressure on *fame rahim* (uterine os) preventing entry of sperm into the uterus, but also on fallopian tube as a result ovum may not reach to the uterus; further it forms *sudda* in uterine blood vessels leading to cessation of menses.^{7,11,28,34,35}

Effect of obesity on ovaries: Obesity causes *zo'afequwwate tawlida mani* due to dominance of *rutubat* and *burudat* in the body,^{8,9} which alter the ovarian function resulting in impaired follicle development^{9,11} and *toole ihtebase mani* (chronic anovulation);^{13,31} both these factors are responsible for infertility.^{8,10,11}

Ibn Sina mentioned in his treatise *Al Qanoon Fil Tibb*, that amenorrhoea is associated with obesity,⁸ infertility,^{9,11} increase ovarian volume, *fasade mani*¹² (dysovulation or anovulation)⁸ and such women resembles men. Hence, there is well established relationship between obesity, amenorrhoea, anovulation and infertility which can be correlated with polycystic ovarian disease.

Diagnosis:

It is made on the basis of history and clinical manifestation.

- Obese infertile women suffer from history of prolonged amenorrhoea which results in masculine features (appearance of excessive hair, beard and change in voice).³¹
- Obesity itself is a sign of infertility.⁸

Diagnosis of temperament of liver: *Sue mizaj barid ratab* is associated with h/o irregular period,³¹ loss of appetite, decrease thirst, fatigue, pain and heaviness at right hypochondriac region. On clinical examination, whitish discolouration of skin, pallor puffy face & *raqeeq bawl*.^{19,30,31}

Diagnosis of temperament of uterus:

General symptoms: Weight gain,¹³ fatigue,^{8,19} excessive sleep and salivation, decrease thirst, increase urination,^{8,13} and cold perspiration.⁸ On examination, white^{8,13,19} and cold skin,^{13,19} *safaid wa raqeeq bawl*^{8,13} *balghamibaraz*,⁸ *saghirbati wa mutafawit nabz*.^{13,19}

Specific symptoms: *Ihtebase tams* or *qillate tams*, thin and pale menstrual blood;^{11,12,36,37} h/o repeated abortions,^{11,31,36} excessive white discharge per vaginum.^{11,13,31} o/e oedema of eyelids,^{10,13} sparse pubic hair,^{8,10} and white discharge coming out from the uterine os.^{9,11,13}

Diagnosis of temperament of ovaries with pubic hair:

Haar Yabis: Rapid growth of pubic hair which is excessive, coarse and thick.

Haar Ratab: Rapid growth of pubic hair which is excess, soft and thin.

Barid Yabis: Slow growth of pubic hair which is sparse and thick.

Barid Ratab: Slow growth of pubic hair which is sparse, soft and thin.^{7,31,32}

Usoole Ilaj (Principle of treatment):

Eliminate the cause of infertility i.e. obesity^{7,31}
Ta'deel sue mizaj sada with tadbeer, ghiza and dawa.^{7,10,11}

Tanqia badan for istifraghe madda followed by tabdil mizaj in sue mizaj maddi.^{7,10,11,37}

Use of *mudirre haiz* advia having *mufattih sudad* property^{14,18} to induce menstruation.⁷

Use of *muwallide mani, muqawwi rahim & mu'ine haml* advia.⁷

Table.No.3: Usoole Ilaj (Principle of treatment) in Unani system of medicine

1- Obesity: Buqrat⁷ and Ibn Sinastates that, if an obese woman wants to conceive¹¹ she has to reduce her weight;^{10,11,36,37,38} even if she conceives risk of abortion is more.^{8,12} Hence, treatment of obesity is the key factor to resume fertility.¹¹

Tadabeer which produces *hararat* and *yubusat*¹² in the body are recommended in obesity like *taqleele ghiza, riyazat, istifraghe madda* and *musakhkhinat*.²⁶

Ilaj bil ghiza (Dietotherapy)

- Diet restriction^{8,11,28,34,38} and starvation.¹¹
- Food should be taken only when one feels true appetite^{8,12,29} and consume food once in a day for weight reduction.^{8,10,12,29}
- Drink lukewarm water or vinegar with *kanji* in empty stomach in the morning.¹²
- **Diet allowed:** Use *qaleel al taghziya wa kaseer al kamiyat ghiza* (less nutritious, food in bulk which fills the stomach)^{8,29} like vegetables & fruits etc.^{7,37,38,39} This will satisfy the appetite without adding much to the quantity of humours.^{8,10,29}
- Add spices such as *filfil, raai, zeera, karuya, lehsan* to the vegetables;^{10,38} use plain soup, only vegetables in diet, dry chapatti,^{11,38} *a'das* or food mixed with *sirka*,^{8,10} *naan khashkar*,⁸ *naan jawain*.¹⁰
- Use salty and bitter foods which act as *mujaffife rutubate badan* and produces *laghari*.
- **Diet restricted:** Avoid cold water,^{8,10} milk, butter, mutton, fish,³⁴ oily and fried food.²⁸

Ilaj bil dawa (Pharmacotherapy)

Oral

- *Istifraghe madda* by purgation, diuresis and excessive vomiting.
- Use *haar, muhallil* and *mulattif* advia¹¹ like *falafali, dawaul luk*.^{8,29}

Single drugs: Ibn Sina mentioned that single drugs which possess *mulattif, mudirre bawl*¹² *wa haiz* properties are recommended to reduce obesity in infertile women: e.g. *juntiyana, tukhme suddab, zarawand mudehrij*,³³ *fitrasaliyoon, sandroos*,²⁸ *koharba, luk maghsool, tukhme karafs, marzanjosh*,^{8,10,38} *laadan, soya*.¹²

Compound drugs:

- Use *mulayyin advia* with *mudirrat* for strong action as *mulayyin advia* reduces the absorption of food in vessels and increases towards intestine and thus helps to reduce obesity. e.g: *dawae kurkum, ma'joone falafali, sanjariniya, anqurooiya, dawaul luk, asanasiya, amroosiya, itrifal sagheer* etc.^{8,10,12}
- Use *maul usool* and *haar mudirrat* like *joshanda poste khyarshamber, mushktaramashi, parsiyaushan, qand siyah kohna* etc.⁹
- Use *ma'joon* having demulcent property e.g: *tiryaqe kabeer, ma'joone kamooni*,^{10,33} *ma'joone biladuri*.¹²
- *Luk maghsool* 3.5gm with vinegar.
- Prepare powder of *zeera, ajwain desi, suddab, karafs, saunf, marzanjosh* each one part, *luk* 2 part and *bura* 1/4th part.³¹

Local:

Huqna (Enema): *Shahm hanzal, raughane zaitoon, namak, boriq.*

Hamool (Pessary): *Shahed, raughane sosan, mur, samagh kankaz, a'sal musaffa, sakbeenaj, muqil, raughane sosan, and mur.*

Firzaja (Tampon): Honey water, *raughane sosan, murmakki*.¹¹

Ilaj bil tadbeer (Regimenal therapy):

1- Riyazat (Exercise): Advice either for *qawi riyazat*^{8,9,33} (followed by massage with resolving oils)^{8,10} or fast running as it liquefies the viscous humours of the body.^{12,29}

2- Mu'arriqat (Diaphoresis): Advice to stay in hot and dry place with exposure to sun light¹² or wear rough and thick cloths^{8,10,38} or apply oil followed by massage⁸ (*dalke sulb kasir*).³⁹

3- Dalk (Massage): Massage over the body with *haar* and *muhallil* oil like *raughan qust* or *raughan shibt* followed by oil prepared from *bikhe karela* and *khitmi, juntiayana, zarawand, marzanjosh, jausheer* and *qanturiyoon*.¹² Massage with *raughan natroonaurzuft* followed by *hammam*.¹¹

4- Abzan (Sitz bath): Advice sitz bath with water that produces *hararat* and *khushke badan* e.g: plain water mix with *namak, shibb, zak, bura armani*.^{8,10}

5- Qay' (Vomiting): Excessive vomiting helps in weight reduction.¹²

6- Hammame yabis (Steam bath): It is recommended preferably before meals,²⁹ obese persons are instructed not to eat immediately after bath, rather they are advised to sleep for a while with empty stomach or perform some exercise followed by intake of small quantity of food.³⁸ *Hammam* with hot water or *aabe mo'addan*^{12,33} are recommended.

7- Fasd (Venesection): *Fasd rage safin* (saphenous vein)⁸ and *rage mabiz* (popliteal vein) are beneficial in obese infertile women, as it divert the flow of blood towards the uterus to induce menstruation.^{9,11}

8- Hijama (Cupping): Razi states that in obese infertile women, cupping over the calf muscle is better than venesection as obesity causes narrowing of vessels and proper removal of morbid matter is not possible through this narrow vessels.¹¹ Cupping improves circulation, divert the flow of morbid matter¹⁰ and helps in its evacuation.¹⁶

2-Ta'deele sue mizaj rahim:

Ilaj bil ghiza (Dietotherapy):

Qaliya, mutanjan, khameeri roti, a'safeer, hot spices, bird's meat, goat's milk¹¹ & carrot⁷ are recommended in diet; advice for less fluid intake or diet restriction.³⁸

Ilaj bil dawa (Pharmacotherapy):

Oral:

- *Tiryaqe mashruditus, ma'joon falasifa, habbe sakbeenaj*
- *Dawa ul misk, ayarije feeqra*¹⁹ *sanjariniya, dehmorsa*.¹²
- *Habb muntin* every 4th day.

- *Irsa* (7gm) with honey water (105 ml).

Local:

Dalk (Massage): *Raughane sosan* or *raughane aqehwan*³² or *raughane bakain* or *raughane balsan*.¹¹

Dhooni (Fumigation):

- Equal quantity of *kalonji*, *gogul*, *kala dana*, *mastagi rumi*.¹²
- Prepare tablets with equal quantity of *mur makki*, *mastagi*, *behroza*, doughed in *rubbe angoor* and used after menses.¹³

Hamool (Pessary):

- Powder of *aqaqiya*, *mazu*, *kundur*, *suk*.
- *Za'fran*, *sumbulut teeb*, *shibb yamani*, 'ood, *sazaje hindi*, *anzaroot*, *zardiye baize murgh*.
- Prepare powder of *jauz buwa*, *kazmazij*, *phitkari*, *poste anar*, each 4.5 gm. (*Mujarrib*)

Firzaja (Tampon): Razi recommended *musakhkhin wa qabiz farzeja* in infertility.¹¹

- *Shibb yamani* 7 gm, *sumaq*, *murmakki*, *za'fran*, 'ood each 3.5 gm, doughed in honey and used for 3 days after menses.³⁸
- *Raughane balsan*, *raughane badam*, *raughane sosan*.

Huqna (Enema):

- 'Ilke saaj, sa'ad, each 90 gm, *murmakki* 30 gm; boiled in 800 ml water and used if one third remains for 3 days.³⁸
- Decoction of *irsa kofta* and *karafs* 200 gms mixed with *raughane badam* 35 gm and *sharbate sikanjabeen*.¹⁴
- *Raughane khazra* or *raughane akhrot* with decoction of *methi*.¹¹

Abzan (Sitz bath):

- Decoction prepared from *s'ad kufi*, *sumbulutteeb*, *qust* & *ajwain*.

3- Sue mizaj maddi (Tanqiya khilte balgham):

Ilaj bil ghiza (Dietotherapy):

- *Baize neem barisht* sprinkled with *darchini* powder.
- *Garam masala*, *qaliya*, *mutanjan*, bird's meat.⁷

Ilaj bil dawa (Pharmacotherapy):

Oral(munzijwa mushile balgham advia):¹¹

- *Habb ayarij*, *habb sakbeenaj*.
- *Maul usool*⁹ with *raughane bede anjeer* 7gm, *ayarij feeqrah* 1 gm and used every morning for 7-9 days.³⁸
- Decoction of *aftimoon*.¹³
- Powder of *mastagi*, *zanjabeel*, *zeera siyah*, each 1 gm with *jawarish jalinoos* 7gm.
- *Mashruditoos*, *sanjareena*, *dawa ul misk haar*, *tiryaqe farooq*, *ma'joone falasifa*, and other *haar ma'joon* and *jawarishat*.⁹
- *Dawa ul misk* with *jawarish buzoor*.¹¹

Local:

Hamool (Pessary):

- *Raughane bede anjeer* or *raughane naardeen*¹⁰ or *gazar dashti*.
- *Za'fran*, *sumbulutteeb*, *shibb yamani*, 'ood, *sazije hindi*, *anzarut*, *charbiye murghabi* and *zardiye baize murgh*.
- *Jauz buwa*, *kazmazish*, *phitkari biryan*, *poste anar* each 4.5 gm finely powdered.¹⁹

Zimad (Ointment):

- *Karnab* and *methi*,²⁶ *tukhme bede anjeer*.⁹

Huqna (Enema):

- Decoction of *babuna*, *soya*, *marzanjosh*, *methi*, *anjeer khushk* mixed with *raughane kunjud*.

Abzan (Sitz bath):

- Decoction of *methi*, *marzanjosh*, *babuna*, *soya*.¹⁰
- Decoction of *shibt*, *pu dina*, *marzanjosh*, *suddab*, *babuna*, *iklilul malik*, *sa'tar*.⁹

Dhooni (Fumigation):

- *Zarneekh surkh*, *mur*, *jauz sar*, *miy'a qinna*, *habbul ghar*; used after menses.
- *Muqil*, *ushq*, *ilak ul ambat*, *shoneez*.¹¹

4- Use of *mudirre haiz* drugs:

Oral:

Single drugs:

- *Darchini*,^{9,33} *abhal*, *asaroon*,^{7,11,33} *anisoon*, *mushk*, *karafs*, *ajwain*, *mur*, *suddab*, *sandroos*¹¹ *tukhme marzanjosh*.⁹

Compound drugs:

- Decoction: *Fotnaj* with *ma'ul a'sal*⁸ or *mur* with *barge anjara* or *methi* with *honey* or *hilteet*, *mur*, *filfil*.¹¹
- Powder prepared from equal quantity of *farfiyun* & *fitrasaliyun*; Oral use of 2 gm powder mixed with decoction of *asaroon*.¹⁰

***Mudirrat qawi*:**

- *Ayarij* and *loghaziya*; ⁷ *Afawiya*, *Fuwwah*.¹¹
- Prepare tablet of *muqil*, *mur*, *abhal* in equal quantity and used in a dose of 10.5 gm.⁹
- *Raughane maghze badam talkh* or *raughane arand*.
- *Joshanda turmus* with *mur* and *suddab*.
- Prepare tablet from the extract of *majeeth*, *mushktaramashi'*, *kirdmana*, *suddab*, *abhal* and *heeng*, each 2 gm and used in a dose of 35 gm.¹¹

Local:

***Hamool* (Pessary):**

- *Farbiyun*¹¹ or *farfiyun*^{10,12} or *bikhe badam talkh*, *usara brinjasif* with *mur*, *zarawand*, *raughane aqehwan*.⁸
- *Ashnan farsi*, *aaqar qarha*, *kalonji*, *suddab taza*, *farfiyun* in equal quantity, mixed with *ganda behroza* and used with *raughane zanbaq*.^{8,11}

***Dhooni* (Fumigation):** (Drugs possess aromatic properties)

- *Nankhwah*,¹¹ *hanzal*, *jao sheer*, *kirdmana*, *hilteet*, *sakbeenaj*⁸ *tukhme karafs*, *heeng*,¹⁰ *mushk*.³¹
- *Methi*,¹¹ *jund bedaster*, *nakchhikni*, *izfarutteeb*, *'ood*, *miy'a saila*.⁷

Abzan (Sitz bath):

- *Suddab*, *abhal*, *karafs*, *karnab*, *raziyana*,⁷ *mushktaramashi'*.

***Zimad* (Ointment):**

- Apply paste of *brinjasif* over supra pubic region¹¹ or *tukhm bede anjeer* over umbilical region.⁹

***Takmeed* (Fomentation):**

- *Afawiya* (over umbilical and suprapubic region).^{7,8,9,11}
- *Sumbul*, *saleekha*, *darchini*, *'ood balsan*, *habbe balsan*, *jawetri*, *jauz buwa*, *elaichi khurd wa kalan*, *qust*, *hamama*, *shagufa izkhar*.^{7,11}

Huqna (Enema):

- *Raughane yasmeen* with *raughane nardeen*,⁷ or *Raughane sumbul* or *qust*.

- *Abhal, turmus, lobiya surkh* each 35 gm, *majeeth, afsanteen, pudina, balcharh, suddab khushk, izkhar*, each 7gm, *shoneez, kundus, behroza, jaosheer* each 4gm, boil in water and mix *rogan yasmeen*. Take 100 ml decoction, add *jund bedaster* 1gmand sprinkle *za'fran* over it.³¹

Ilaj bil tadbeer (Regimenal therapy):

- **Fasd (Venesection):** Ibn Sina states that saphenous vein is situated near to the uterus, hence venesection of saphenous vein is recommended for evacuation of morbid matter before the expected date of menstruation.^{7,8,9,11,13,19}
- **Hijama (Cupping):** Application of *hijama bil shurtover* calf muscle is useful in *ihtebase tams*^{8,9,11,12,31} or *hijama bila shurt* over supra pubic region.¹² Ibn Sina recommended *hijama* over ankle joint & calf muscles in amenorrhoea due to obesity.⁸

5-Use of muwallide maniand mu'ine haml advia:

Ibn Sina mentioned that *mu'ine haml advia* possesses aromatic property with hot and dry temperament.^{7,8,12}

Ilaj bil ghiza (Dietotherapy):

- *Shorba, chapati, moong, arher dal, kaddu, khurfa, turai, bhindi, palak,*¹⁹ *chana, methi.*¹²

Ilaj bil dawa (Pharmacotherapy):

Oral:

- *Tukhme atangan, anisoon, zanjabeel, buzidan, za'fran, qust shireen, harf, siyah mirch, tudari surkh wa zard, behman surkh wa safaid, khulanjan, darchini, kharkhasak, ajwain, shagaqule misri.*
- *Ma'joone laboob, ma'joone buzoor, jwarishe zar'ooni.*¹²
- *Dawa ul misk jawaher wali* (5 gm), *ma'joone qurtum* (7 gm).¹⁹
- *Burade dandane feel* 4.5 gm^{7,9,10,19,31,36,38} *tiryaqe mashruditus, dawae sakbeenaj, tukhme sisaliyoos,*^{8,10} *tukhme anjadan rumi,*^{31,38} *tukhme anjarah barri, rubbe hasram,*¹¹ *tukhme gazar.*⁹
- Prepare powder from *burade a'aj and nabt safaid*, each 3 gm.³⁴
- Used *habbe haml* 1 tablet with *ma'joone mocharas* 10 gm in morning and *habbe marwarid* 2 tablet with *arq ambar* 30 gm, *arqe gao zaban* 70 gm with *misri* 20 gm in evening.
- *Safoofe raishe bargad* mixed with equal quantity of sugar and used with 250 ml milk after menses.¹⁹
- Prepare tablet of *mushk* 250 mg, *afyun, jauz buwa, za'franeach* 1gm, *barge qinnab* 2 gm, *qand siyah kohna* 5.25 gm, *qaranful* 4 pieces, *fofil* 3 pieces mixed with sugar and used for 3 days after menses.⁹

Local:

Firzaja (Tampon):

- Prepare tablet of *miy'a saila, jund bedastar, behroza, jao sheer, habb ul ban, habbe balsan, qust, balcharh, muqil*; mixed with *sharab* and used before intercourse.³¹
- *Za'fran, sumbuluttee, shibb yamani, 'oode gharqi, sazije hindi* and *anzaroot* each 3 gm; finely powdered, mixed with 10 gm of *charbiye murghabi* and *zardiye baize murgh.*¹⁹
- *Za'fran, hamama, sumbul, ikkilul malik* each 12 gms, *sazij* and *qaradmana* each 35 gm, *charbi murghabi* and *zardiye baize murgh* each 17 gms and *raughane nardeen* 35 gm and used after menses.¹¹
- Prepare powder of *shibb yamani* 7 gm, *sumaq, za'fran, 'oode hindi* each 3.5gm mixed with honey and *raughane gul.*⁷
- *Za'fran, mastagi, sumbul, jund bedatser, raughane nardeen.*
- *Shahed, sakbeenaj, muqil, raughane sosan.*⁸
- *Mur makki, jao sheer, balcharh, nakhuna, bikhe sosan*, doughed with honey.
- *Behroza, hartal surkh, habbul ghar, jauz al saru* in equal quantity.³¹

Dhooni (Fumigation):

- *Habbul ghar* and *miy'a saila* doughed in *shahed*, prepare 3.5 gm tablet and used thrice daily.¹¹

- Prepare tablet from equal quantity of *hartal surkh, mur makki, jauzul saru, miy'a saila, gulab* and *habbul ghar* doughed with *sharab* and used one tablet following menstruation. (*mujarrib nuskha*)⁷
- *Raughane balsan, 'oode balsan, habbe balsan*.^{12,33}
- '*Ood, mushk, ambar, ghaliyah* before intercourse.³¹
- *Qurs* prepared from *mur, mi'ya, habbul ghar*.¹¹

Hamool (Pessary):

- *Farbiyun*,¹¹ *brinjasif*,^{12,33} *samagh* and *kundur*,⁸ *tukhme gazar* or *tukhme anjara*,⁹ *raughane bede anjeer*,³³ *gogul*¹² before intercourse.⁸
- *Jund bedastar, miy'a saila, mur makki, qust, ganda behroza, gogul, jao sheer* in equal quantity, mixed with *sharab* and *mushk*.¹²
- *Balchharh, sa'lab misri, raughane balsan, raughane bakyin, raughane sosan*.³⁸
- Prepare powder from *mushk* 250 mg, *za'fran* 2 gm, *sa'lab misri* 3 gm mixed with honey 10 ml.¹⁹
- Prepare powder from *jauz buwa half dana, halela zard 1 dana & zaj* 125 mg.⁹

Shiyaf (suppository):

- *Raughane balsan, ban, izfar ul teeb*.

Huqna (Enema): Razi recommended use of *musakhkhin huqna* in infertile women.¹¹

- *Shahme hanzal*,⁸ *raughane balsan, raughane sosan*,¹⁰ *usara bartang*.
- Prepare powder from *kaephal* and *nabat safaid* each 3 gm.³⁴

Pharmacological Studies: Preclinical and clinical studies provide evidence that herbal medicines may have beneficial effects for the regulation of ovulation, menstruation, improved metabolic hormone profile and improved fertility outcomes in obese infertile women.

1. Sambhalu (*Vitex agnus-castus*) Fig.1: Pre-clinical and clinical evidence was found for *Vitex agnus-castus* for lowered prolactin, improved menstrual regularity and infertility. It contains flavonoid apigenin which has selective binding affinity for the beta-estrogen receptor subtype. Apigenin also shows regulatory effects on fat tissue homeostasis and estrogenic effects on uterus. It inhibits prolactin secretion by dopamine receptors antagonism. **Dose:** German Commission E recommends 30- 40 mg of dried fruit extract daily, 40 drops of tincture or fluid extract ([1:1] g/mL) 0.5-1.0 mL daily for 4-6 months.⁴⁰

2. Hulba/Fenugreek (*Trigonella foenum graecum*) Fig.2: A randomized clinical trial on efficacy of hydroalcoholic extract of Fenugreek on PCOS patients has shown significant decrease in polycystic appearing ovaries on ultrasound and regularization of menstrual cycle⁴¹ due to presence of furostanolic saponins.⁴² Chloroform extract of seeds reported estrogenic activity on in vitro study which is attributed to the presence of phytoestrogens.⁴³ Ethanolic extract of *Trigonella foenum graecum* seed showed lower serum total cholesterol, triglyceride, LDL cholesterol and higher values of HDL cholesterol by decreasing the hepatic lipid content mediated by diosgenin, the main aglycon of fenugreek.^{44,45} **Dose:** The German Commission E recommends an internal daily dose of 6 grams, infusions 0.5 grams, fluid extract 1:1 (g/ml) 6 ml, Tincture 1:5 (g/ml) 30 ml.⁴⁶

3. Darchini/Cinnamon (*Cinnamomum zeylanicum*) Fig.3: A double blind randomized controlled clinical trial conducted on obese PCOS patients indicated that 1.5 gm of Cinnamon for 8 weeks significantly improved antioxidant status and lipid profile. Antioxidant activity is attributed to high levels of phytochemicals compounds with free radical scavenger actions, such as epicatechin, camphene, eugenol, gamma-terpinene, phenol, salicylic acid, tannins & proanthocyanidins. Antihyperlipidemic activity of cinnamon is due to high contents of polyphenols inhibiting the intestinal absorption of cholesterol.⁴⁷ Cinnamon extract has been

shown to reduce insulin resistance in in vitro and in vivo studies by increasing phosphatidylinositol 3-kinase activity in the insulin signaling pathway and thus potentiating insulin action in obese infertile women.⁴⁸

4. Ajwain/Omum seeds (*Trachyspermum ammi* Linn.): Methanol and petroleum extract of *ajwain* powder reported hypolipidemic effect⁴⁹ on in vivo study in albino rabbits, evidenced by decreased total cholesterol, LDL-cholesterol, triglycerides and total lipid and significantly increased HDL-cholesterol.⁵⁰ It also possess significant amount of fibers which effects fat metabolism by reducing its absorption from intestine. Aqueous and methanolic extract of *T. ammi* seeds possess antioxidant activities which helps in reduction of PCOD evidenced by scavenging the free radicals or induced antioxidant enzymes on in vitro study. This activity is attributed to presence of phenols.⁵¹ Thus *Ajwain* helps in reduction of obesity and conception in obese infertile women.

5. Anisoon/Aniseed (*Pimpinella anisum* Linn) Fig.5: *Anisoon* exhibits estrogenic activity, thus beneficial in cases of female infertility associated with irregular menstruation as it maintains hormonal balance. RCTs demonstrated that *anisoon* showed improvement in frequency and intensity of hot flushes in postmenopausal women due to estrogenic property exhibited by trans-anethol.⁵² Aniseed essential oil exhibits antioxidant activity by inhibiting copper catalyzed oxidation of Low-Density Lipoproteins (LDL) due to presence of total phenol, flavonoids and linoleic acid on in vitro study. It also possess anti-hyperlipidemic activity due to presence of total phenol, flavonoids and linoleic acid⁵³ which has got antioxidant and free radical scavenging potential.⁵⁴ Thus it is an excellent choice for treatment of obese infertile women.

6. Karafs/ Celery (*Apium graveolens* Linn.) Fig.6: Methanolic extract of *apium graveolens* has effective role in obesity induced infertility as it has shown anti-obesity,⁵⁵ hypoglycemic,⁵⁶ hepatoprotective, anti-oxidant properties due to presence of flavonoids, glycosides phenolic constituents such as apigenin & luteolin.^{57,58}



Fig.1: *Vitex agnus castus*



Fig.2: *Trigonella foenum graecum*



Fig.3: *Cinnamomum zeylanicum*



Fig.4: *Trachyspermum ammi* Linn.



Fig.5:*Pimpinella anisum* Linn.



Fig.6:*Apium graveolens* Linn.

Conclusion: Infertility affects approximately one in six couples during their lifetime. Obesity has become an epidemic because of sedentary lifestyle and dietary changes. Obese women are three times more likely to suffer from infertility than the women with normal body mass index and may take longer time to conceive. Pharmacological treatment of obesity is associated with rebound weight gain, side effects of medication and the potential for drug abuse. Available treatment in conventional medicine for obese infertile women are associated with complications such as ovarian hyper stimulation syndrome, reduces ovarian reserve and pelvic adhesions. Effective management is available in Unani system of medicine without such side effects. Despite of several Unani drugs mentioned, clinical trial has been conducted on few medicines with inadequate randomization, small sample size, inappropriate placebos & Wide variations in the dose&duration of treatment. There is lack of common standards and appropriate methods for evaluating Unani Medicine to ensure the safety, efficacy and quality control. This indicates the importance and necessity to develop a standard operational procedure for the standardization of drugs and formulations. Hence there is a need for systematic clinical trials to enhance global acceptance.

Conflict of interest: None declared

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