A CONCEPTUAL REVIEW OF LITERATURE OF CAUSES OF INFERTILITY (VANDHYATVA)

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INTRODUCTION

One of the major rising problems in present era is the increase in population. Inspite of promotion of family planning methods by government, it is still a pertaining problem in our society. The population of India was estimated to be 1.34 billion [as per Jan 2017]. This is an increase of 1.26% compared to last year. Although India has a long history of promoting family planning and despite the recent advancements in contraceptive advices, the need for family planning remains higher than anywhere else in world. (as estimated by demographic studies India would be the first highly populated country in the world by 2050) Today, there is a pressing need for limiting the family size at personal level and control population at national level.

The need of birth control has risened through increased cost of living, scarcity of accommodation, a desire for better education to children in the present competitive world and an overall desire for an improved standard of living. Population control is mandatory at national level too, as it causes an increased demand for food, shelter and successful implementation of National programmes. One of the Effective remedy to check the overgrowth of population is to control the birth rate and Contraception is the only “Tool” which can control the fertility rate. Contraception is of two types, permanent and temporary. The permanent method of contraception is adopted when the couple do not need further issues. Temporary method is employed to space or postpone the pregnancies. Barrier contraceptives, chemical contraceptives and Steroidal contraceptives are different methods of
temporary contraception. Steroidal contraceptives are most popularly used temporary contraceptives owing to the less failure rate. 100% contraception can be achieved with proper use. Hormone based contraceptive medicines cause adverse effects like weight gain, nausea, headache, cervical cancer, carcinoma of breast, deep vein thrombosis. Now a days very low dose contraceptives are available but these too have adverse effect on the health of the lady. Hence there is a need for the availance of contraceptive measures which are free from adverse effects, more effective, easily available and cheaper.

REVIEW OF LITERATURE

1. Vedas
Various Methods of male and female contraception are available in the vedas. The man is made impotent or infertile by use of drugs or by crushing his two nadis. Probably this is the oldest documented reference of surgical technique (vasectomy) in the ancient manuscript that renders man sterile. The drugs and mantras to make woman infertile are also narrated in the vedas. In the female the nadis of the yoni are obstructed by stone and the yoni is rendered incapable of receiving garbha. This description reflects on the use of intrauterine contraceptive devices during those days. The unmarried girls used to get themselves aborted, the person inducing abortion was punished.

2. Brahmans
Use of certain mantras to cause absence of virya in a man was in practice to regulate the conception.

3. Upanishad
Brihat Aranyaka Upanishad (100B.C.) provide, the method and to avoid pregnancy and carried an interesting reference of yogic practices of Abhipanana and Apana in the control of ejaculation.

4. Manusmriti
Manusmriti, great Ancient Indian treatises, the oldest text on religion of Hindu written by Manu, sociologist of that era. He has given an account of the social laws of life. He had advocated late marriage. Thus the family life was limited only for 25 years, that too with many other social limitations for coitus like during several sacred days in the year, full moon, first four days after menstrual flow and during menstrual bleeding and for two year postpartum by living at parents house.
5. Samhitas
There is no reference of contraception in Brihatrayees. The references on contraception are available in the treatise of Yogarathnakara and Bhavaprakasha. (17 AD). Various oral preparations, local applications to the vagina and external application like the amulets etc. are mentioned by these Acharyas.

Garbha Sambhava Samagryi (Factors Essential for the Formation of Garbha)
Acharyas have explained various factors which are essential for achievement of conception termed as Garbha Sambhava Samagryi. Normalcy of these factors is also of importance to achieve conception.

Acharya Charaka explains the process of conception as follows: When both stree and purusha after following the specific regimen of diet and other mode of life perform coitus and the unvitiated Shukra enters the healthy yoni, reaches the garbhashaya, unite with shonitha which results in conception definitely. He equates this phenomena to the the milk mixed with yeast resulting into curds or the white cloth taking up any dye. In the same manner sukra also gets changed (in the form of Garbha).

Acharya Sushruta compares the process of garbhothpatti to the germination of seed. He says that the normalcy(avyapanna) of ritu, kshethra, ambu and beeja are essential for conception just like they are for germination of seed. According to Dalhana, the rutu is rutukala, kshetra is garbhashaya, ambu is rasa which is formed from the paka of ahara and beeja is shukra and shonita Anupaghata or normalcy of all these factors are required for the formation of garbha. Vagbhata 1 has given importance to kshethra and beeja in the formation of garbha. Vagbhata 2 says in addition to the healthy garbhashaya, marga, rakta and shukra, properly functioning vayu and normal psychological status are also essential for conception. In a nutshell the factors essential for conception are ritu, kshethra(marga), ambu, beija(healthy Shukra and Shonita) vayu, atma, manas (normal psychology), healthy and properly functioning female reproductive system, (well prepared Garbhashaya). Consolidating the opinions of all Acharyas we can come to a conclusion that Shukra, Shonitha along with Jeevathma, avyappanna kshethra, rasa (ahara rasa), vayu atma, manas are essential for conception Four factors which are essential for conception are given by Acharya Sushrutha.
DISCUSSION

Hormonal Regulation of Menstrual Cycle

1. During the bleeding phase of the menstrual cycle, the levels of estrogen, progesterone, FSH, LH are low.

2. Absence of estrogen leads to secretion of FSH from the pituitary and cohorts of growing follicles are recruited. These follicles each secrete increasing levels of estrogen as they grow in the follicular phase. The increased secretion of estrogen is the stimulus for uterine endometrial proliferation.

3. A stage comes when the Graffian follicle is almost mature, Estrogen secretion from the mature follicles is strong and a small amount of Progesterone is also secreted from the matured follicles. Rise in estrogen levels provide negative feedback on pituitary FSH secretion, which begins to reduce by the midpoint of the follicular phase. In addition, the growing follicles produce inhibin B, which suppresses FSH secretion by the pituitary. Conversely, LH initially decrease in response to rising estradiol levels, but late in the follicular phase the LH level is increased dramatically [biphasic response].

4. At the end of the follicular phase (just before ovulation), FSH induced LH receptors are present on granulosa cells and with LH stimulation, modulate the secretion of progesterone.

5. A very high blood level Estrogen and a little Progesterone cause a +ve feedback on pituitary, the pituitary LH surge is triggered; this induces ovulation 24 to 36 hrs later. LH surge leads to the formation of corpus luteum also. Hence there is theintiation of the luteal phase of the ovary and the secretory phase of the endometrium. Corpus Luteum produces Progesterone and estrogen.

6. Progesterone levels rise precipitously after ovulation. Continued presence of Progesterone causes degeneration of corpus lutem which in turn leads to sharp fall of E and P levels in blood, thereby setting the stage for the next cycle.

Hormones Related To Conception

1. ESTROGEN

Estrogens are defined as the biological substances. They are compounds which can produce estrus in ovariectomised animals. The important estrogen in mammals are steroids with 18 carbon atoms and an unsaturated ring. There are hundreds of non – steroid compounds which
have estrogenic activity. The most important one secreted by the ovary is estradiol. Oestrone is also secreted but its biologic activity is less than that of oestradiol.

**Varieties**

- **Synthetic** – they are benzanthracene compounds and not sterols. E.g. Ethinyloestradiol, Diethylstilboestrol.
- **Natural** – they are all sterol derivatives e.g. Oestrone, oestriol.

**Sources:** Ovary, placenta, testes and adrenal cortex.

**Production:** The main and most powerful estrogen produced by the ovary is estradiol but the less active estrone is also secreted and both are found in circulation they are inactivated by the liver and their metabolites are excreted in the urine and faeces. When liver function is impaired, the amount of active estrogen in circulation is increased and excessive menstrual bleeding can result. The most important metabolite is estriol which has low degree of biology activity. Estradiol is produced by the granulosa and theca cells in increasing amounts as the follicle ripens. The former have FSH receptors and the latter have LH receptors. In response to LH, thecal cells produce androstenedione and testosterone. These are then converted to estrogens in the granulosa cells by the process of FSH induced aromatization. Production, at first moderate in amount, reaches a peak just before ovulation; thereafter it falls until the corpus luteum forms and becomes active to give rise to a second but smaller peak. When the corpus luteum degenerates, the output falls sharply. The total quantity of oestradiol formed during one cycle is estimated to be 10mg., 25% of this excreted in the urine. While estradiol is the chief hormone in the reproductive age, estrone is the main hormone in the menopause and oestrial in pregnancy.

**Functions of the estrogens**

- The principle action of estrogen is to induce estrous. Also helps for the development of the accessory female genital system.
- Sensitization of ovaries to gonadotropins.
- Estrone also stimulates the development of the mammary duct system.
- Deposition of subcutaneous fat.
- Stimulation of growth of both the myometrium and endometrium.
- Maintenance of thick vaginal mucosa.
- Stimulation of cervical glands to secrete copious quantities of viscous mucosa
PROGESTERONE

Progesterone is the pregnancy hormone which is synthesized and secreted in increasing amount from the placenta.

The corpus luteum is the major source of the hormone in adult non pregnant women. It has little or no action on neuroendocrine control of reproduction when acting or administered alone but, combined administration of estrogen and progesterone inhibits gonadotropic function, as evidenced by the anovulatory response of the combined contraceptive pills.

Varieties

- Synthetic e.g. Ethisterone, A–norprogesterone, 19 – norprogesterone.
- Natural – it is sterol derivatives e.g. progesterone, pregnanediol, pregnenolone.

Sources: Corpus luteum, placenta and adrenal cortex.

Production: Progesterone produced by the ovary is rapidly metabolized by the liver. One of its products excreted in the urine is the biologically inactive pregnanediol, but this accounts for only 10 percent of the hormone which enters the circulation, the fate of the remainder is largely unknown. Progesterone is secreted mainly from the corpus luteum so its production during the early follicular phase of the cycle is negligible. However, LH initiates luteinization and progesterone production in the granulosa layer. This preovulatory rise in progesterone facilitates the positive feedback action of oestrogen.

Thus progesterone plays a role in inducing the midcycle FSH peak, which facilitates the release of the oocyte from its follicular attachment. Immediately prior to ovulation, when the theca interna begins to luteinize, and during the luteal phase, the plasma progesterone level rises from 6 to 63nmol/lit, falling in the next follicular phase to 1.3–6 nmol/lit. The total amount of progesterone produced by the ovary during one menstrual cycle is 300 – 400 mg.

Functions of progesterone

- Responsible for premenstrual changes of uterine mucosa.
- Essential part in pregnancy - Embedding the ovum - Essential for the formation of placenta - Inhibits uterine muscles.
- Development of breasts.
- Inhibits oestrous cycle or ovulation.
- Causes enlargement of birth canal.
- Relation with oestrogens.

**Concept of Garbha Niroda**
Niroda: Ni+rudh bhave dhanj
Nirodhaka: Nitharam runadi
Niroda means to obstruct, check, arrest, prevent, stop, restrain, control
Garbha niroda can be interpreted as to control or prevent conception

**Anti-fertility**
Anti-a prefix signifying counter acting, effective against, opposing or opposite.
Fertility-capacity to induce conception or conceive
Anti-fertility means that which counteracts conception

**Action of Oestrogen**
- ↓ FSH release
- Prevent emergence and selection of dominant follicle
- Provide stability to endometrium
- Prevent irregular shedding and unwanted breakthrough bleeding
- Potentiates the action of progestational agents.

**Action of Progestogens**
- Prevent LH surge necessary for ovulation
- Cervical mucus becomes thick and impervious to sperm transport
- Produces an endometrium not receptive for implantation
- Influences secretion and peristalsis of fallopian tubes
- Counteracts undesirable side effects of oestrogen like endometrial hyperplasia and heavy withdrawal bleeding.

**Contraception in Ayurveda**
Brihatrayees discus in detail regarding the treatment of vandyatwa but there is no mention on the topic of contraception. Probably because of there was no population explosion. The later treatise like Bhava Prakasha Yogarathnakara discus regarding the contraceptives (Garbha nirodaka). In Yogarathnakara description of abortificients (Garbha pathaka) is also highlighted. These contraceptive measures are either local/external or oral.
Garbha Nirodhaka measures

Local or External applications

- Application of paste prepared by Saindhava lavana and thila thaila to the vagina prior to coitus
- Yoni dhupana with Nimba twak during rithkala
- Yoni purana with Dattura moola kalka
- Tying the Root of dhattura uprooted on Krishna chaturdashi to waist of the woman. Conception will not take place in the woman until the root is removed.

Oral measures

- Pippali, Vidanga, Tankana powder in equal quantity with water or milk during ritukala
- Talisa patra and gairika in a dose of one karsha with cold water on 4th day of menstruation
- Menstruating women should take Japa kusuma pasted with kanji followed by 100 years old Guda for three days during menstruation.

Local/external abortificients

6 inches long Eranda kanda inserted into vaginal canal causes abortion of even four months.

Oral medication

- One karsha chitraka moolakalka with nirgundi swarasana and honey
- Powder of Grinjana beeja and dadima moola-3 karsha each, tuvariand sindhura-2 karsha each with water
- One karshaof the scrapings of white wash(lime wash) of temples mixed with cold water
- Dung of mare dissolved in kanji, strained through a cloth and mixed with Saindhava lavana, ugra, asuri, taila, visha

REFERENCE

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