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Review Article

UTILITY OF THE CONCEPT OF GARBHOTPADAKA SAMAGRI (ESSENTIAL FACTORS FOR CONCEPTION) IN THE PRESENT ERA

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ABSTRACT

Fertilization is essential for propagation of species and their evolution. It is the process of union of male and female gametes resulting in the formation of a zygote. Thereafter implantation and growth of the fetus takes place in the uterus till delivery. So formation of a baby from the period of conception till delivery depends upon the factors such as fertile period, healthy uterus, nutrition from the mother and healthy sperms. The proper knowledge about all these factors will definitely lead to the production of a healthy offspring. This concept is well explained in Ayurvedic classics as healthy progeny will be formed when there is proper union of Rutu (fertile period), Kshetra (Uterus), Ambu (Nutrition) and Beeja (Gamete) in their superior state.

Keywords: Rutu, Kshetra, Ambu, Beeja, Sperm, Ovum

INTRODUCTION

Pregnancy is a unique, exciting, responsible and often joyous time in a woman's life, as it highlights the woman's amazing creative and nurturing powers while providing a bridge to the future. But in the present scenario childlessness and infertility cases are rising dramatically. Despite the incredible fertility of some women, most women find that it takes a little effort to get conceived. The timing of that intercourse must be just right so that sperm and egg get to meet. There must be no significant obstacles that would prevent the sperm from reaching the egg. The sperm and egg must be good-enough quality. It also depends upon the condition of the uterus also. If any of these or other important coincidences do not occur, pregnancy will not occur. Ayurvedic classics also have highlighted the same factors in the form of Garbhotpadaka Samagri (Essential factors for conception). Here is an attempt made to understand the concepts of Garbhotpadaka Samagri in detail in comparison with modern concepts of conception and its utility in different obstetrical and gynecological conditions such as infertility, intrauterine growth retardation, congenital abnormality and family planning methods.

Literary Review

The union of Shukra (sperm) and Aartava (Ovum) along with Aatma (soul) inside the Kukshi (Uterus) is known as Garbha (Fetus).¹ After the development of body parts such as arms, legs, tongue, nose, ears it is termed as Shareera (Human body).² Garbhotpadaka Samagri refers to a complete collection of factors for the production of the Garbha in their purest or un diseased form.

The co-ordination of four factors-Rutu (fertile period), Kshetra (healthy womb), Ambu (the nutrient fluid of healthy mother) and Beeja (healthy gamete) along with proper observance of

rules are necessary for the conception and development of the healthy child. Just as the proper season, good soil, water containing nutrients and pure seeds together with proper care help the germination of a strong undiseased sprout.³

Rutu (Fertile period/Age)

Rutu means the time favorable for procreation to get a healthy progeny⁴ or fertile age. Rutu is the period of ovulation in a female. Since seeds deposited during this period likely to bear fruit (conception) it is termed as Rutukaala (Fertile period).⁵ The Rutu is of sixteen days' duration in which first three days and last one day should not be considered since in first three days there will be bleeding and last day there will be constriction of the Yoni (Cervix/vagina). So total duration of Rutu becomes twelve.⁶

As lotus flower closes after sunset, similarly after Rutukaala, Yoni of woman gets constricted and does not accept Shukra (sperm) or permits the entry of Shukra (sperm).⁷ Hence conception will occur only during Rutukala.

After the previous menstrual period a new cycle has started, after taking bath, a woman possessing healthy Yoni (cervix), Garbhashaya (uterus) and Shonita (healthy reproductive system and ovum) is termed as Rutumati (woman who is under fertile period).⁸ In this period the woman looks bright and healthy, anxious to have sexual relations, happy and excited.⁹

The coitus during menstrual flow is not good, as a light article thrown in the flowing river against the current never reaches upwards, similarly sperm deposited during menstruation does not reach uterus.¹⁰

For females' fertility peaks from age 20-25 years and begins to decrease at age 30 years. Fertile age for male is 25 to 55 year. As age progresses there will be reduced fertility associated with involvement of metabolic or systemic diseases.

Kshetra (Uterus)

Kshetra refers to Garbhashaya (Uterus¹¹). That which becomes abode for Garbha (fetus) is the Garbhashya. The Shuddha Shukra (healthy sperm) passing through healthy Yoni reaches healthy Garbhashaya (Uterus) and mixes with Shuddha Shonita (healthy ovum) leads to the healthy offspring.¹²

Ambu (Nutrition)

It is the Rasa dhaatu produced by the metabolism of food in the mother's body that nourishes the foetus.¹³ The Garbha for its nourishment and excretion of waste material from its body completely depends upon the mother. In initial stage when its specific body parts though present not explicit, it obtains its subsistence by attracting moisture and osmosis. Afterwards when body parts are conspicuous, a part of nourishment is obtained by Upasneha (moisture) permeating through pores of skin situated in hair roots of the body and a part through the passage of the umbilical cord. The fetal umbilicus is attached to the Umbilical cord, Umbilical cord to the placenta and the placenta to the mother's heart. The mother's heart immerses the placenta through running and oozing vessels. Mother's diet contains nourishing factors, which gives strength and complexion to the fetus.¹⁴

Beeja (Gamete)

The Shukra (sperm/seed) and Artava (ovum) are considered as Beeja which take part in the formation of Garbha (fetus).¹⁵ For a successful fertilization the shukra (sperm) and artava (ovum) should be with optimal qualities.

DISCUSSION

Childlessness may be a tragedy to a married woman and can be a cause of marital upset as well as personal unhappiness and ill health. Childlessness may result from recurrent abortion or stillbirth but commonest cause is failure to conceive.¹⁶

Factors responsible for fertility are healthy spermatozoa, capacitation, acrosome reaction, motility of spermatozoa, proper ovulation, reception of the ovum by fimbriae, fertilization at ampulla, entry of the zygote in to the uterine cavity, receptive endometrium for implantation and adequately functioning corpus luteum¹⁷.

By observing the above mentioned factors it can be understood that the factors which are told as Garbhotpaadaka Samagri can be considered as the essential factors for the formation of Garbha.

Rutu (Fertile period/Age)

Based upon the classical references Rutu can be taken as fertile period or fertile age. It is the period where conception can likely to be occurred. In a 28-day menstrual cycle, ovulation takes place at about middle of the cycle. The period between ovulation and the next menstrual bleeding is constant at about 14 days. The days in which conception can likely to occur are calculated as; the shortest cycle minus 18 days gives the first day of the fertile period. The largest cycle minus 10 days gives the last day of fertile period. The cases where calculations are not possible the fertile period is considered to be from 8th to 22nd day of menstrual cycle counting from the first day of menstrual period.¹⁸ The period of ovulation can also be assessed by increase in basal body temperature; production of clear and scanty cervical mucus, pain associated with ovulation etc.¹⁹ So the knowledge

about Rutu either can be used for family planning method for abstinence or to get definite conception.

Advanced maternal age (above 35 years) is one of the significant cause associated with chromosomal abnormalities such as Down's syndrome (trisomy 21), trisomy 13 and trisomy 18. It is believed to be the cause for non-disjunction during meiosis. Also the women who conceive after the age of 30 years have the risk of abortion, preeclampsia because of abruptio placenta, uterine fibroid, pregnancy induced hypertension, gestational diabetes, intra uterine growth restriction, preterm labour or prolonged labour.²⁰ In males as age progresses there will be reduced sperm count, decreases sperm motility and abnormal morphology of sperm.²¹

Kshetra (Uterus)

Uterus serves as the part of the pathway for sperm deposited in the vagina to reach the uterine tubes. It is also the site of implantation of a fertilized ovum, development of fetus during pregnancy and labour. Implantation occurs in the endometrium of the anterior or posterior wall of the body near the fundus on 6th day which corresponds to 20th day of menstrual cycle. Endometrium will be in the secretory phase corresponding to 20-21 days of cycle. There will be growth and coiling of endometrial glands, vascularization and thickening of the endometrium, secretion of glycogen by glands. These preparatory changes peak about 1 week after ovulation.²² The uterine endometrium must be sufficiently enough for effective nidation and growth of the fertilized ovum. The possible factors that hinder nidation are uterine hypoplasia, inadequate secretory endometrium, fibroid uterus, endometritis and congenital malformations of uterus. So these conditions should be checked and treated to have conception.²³

Ambu (Nutrition)

The explanation about Ambu in classics clearly indicates about fetal nourishment at different stages. Before implantation blastocyst obtains its nutrition from the uterine endometrial secretions called uterine milk. After implantation decidua or endometrium of the pregnant uterus provides nutrition. The glands show marked dilatation and increased tortuosity and increased secretory activity. The endometrial stromal cells contain extra quantities of glycogen, protein, lipids and minerals necessary for conceptus. Till 8th week in this way, later gradually it is taken up by placenta.²⁴

Placenta is the site of exchange of nutrients and wastes between mother and fetus. Also produces hormones needed to sustain pregnancy. The placental pathology includes placenta previa, abruptio, circumvallate and infarctions.

Umbilical cord is the actual connection between the placenta and the embryo, later the fetus. It develops from the connecting stalk. It consists of 2 arteries carry deoxygenated fetal blood to the placenta, one umbilical vein which contains oxygenated blood and nutrients from mother's intravillous spaces in to fetus. Umbilical cord abnormalities include long cord, short cord and true knot of the cord can act as lethal to the fetus.

The hormones which are essentials to maintain the pregnancy can also be taken under Ambu since they are carried through the fluid media. In pregnancy placenta forms large quantity of Human Chorionic Gonadotrophin (hCG), estrogen, progesterone and human chorionic somatomotropin which are essential to normal pregnancy. hCG secreted by trophoblast cells in to the fluids of the mother. It causes the corpus luteum to secrete large quantities of progesterone and estrogen for next few months. They prevent menstruation and cause endometrium to grow and store large amount of nutrients. Estrogen does the enlargement

of the uterus, growth of the breast ductal structure, relax pelvic ligaments. Progesterone causes decidual cells to develop in the uterine endometrium and thus play important role in nutrition. It decreases contractility of pregnant uterus preventing abortion. It contributes to the development of the conceptus even before implantation by increasing secretions of mother's fallopian tube and uterus to provide appropriate nutritive matter to the developing morula and blastocyst. Human chorionic somatomammotropin helps in development of breast, formation of protein tissue, decreases utilization of glucose by mother's body, increase availability to fetus. Hormonal abnormalities include luteal phase defect, results in early miscarriage as implantation and placentation are not supported adequately²⁵.

So all these entities should be screened during antenatal check up and proper precautionary measures should be adopted to have a healthy baby. The measures advised in Maasanumasika garbhini paricharya (Month wise antenatal care) should be followed. The ideal pregnancy diet should be light, nutritious, easily digestible and rich in protein, minerals and vitamins. Nutrition to the fetus plays important role in its growth and development. So any abnormality of the above mentioned factors either cause growth restriction or become lethal.

Beeja (Gamete)

It is evident that healthy status of gametes is essential for the production of a healthy offspring. Due to the abnormalities of Beeja (gametes), Atma karma (deeds of previous life), Ashaya (uterus), Kaala (time factor/rutukaala) and diets along with mode of life of mother, the vitiated Doshas produce abnormalities in the fetus affecting its appearance, complexion and Indriyas (Sense organs).²⁶

In conditions such as Shukra dushti (Sperm abnormality) and Arthava dushti²⁷ there will be a state of Abeeja (absence of sperm/ovum) which can lead to failure in conception.

If there is vitiation of Beeja bhaaga (chromosome) of Beeja which is concerned with formation of particular organ in the fetus, there will be defect in the related part in the fetus. Vitiating of Beeja bhaaga (chromosome) which is related to the formation of reproductive organs in females cause Vandhya (sterility) and in males cause Vandhya (sterility). Vitiating of Beeja bhaga avayava (gene) which is related to the formation of reproductive organs in females cause Varthaa (Turner's syndrome) or Puthipraja (abortion) and in males cause Vartha (Klinefelter's syndrome) or Puthipraja (abortion).²⁸ There are certain diseases mentioned in the classics which are inherited from their parents with Beeja dushti (abnormal gametes) such as Kushta (Skin disease), Prameha (Diabetes) and Arshas (Hemorrhoid)²⁹.

According to modern science sperm and semen abnormalities are one among the causes of infertility. Sperm abnormalities are categorized by whether they affect sperm count, sperm movement, or sperm shape³⁰. They are Oligospermia, Asthenospermia and Teratospermia. The perfect sperm structure is an oval head and long tail.

Abnormalities of semen are Azoospermia, Oligozoospermia, Haemospermia, Oligospermia, Aspermia and Pyospermia.

Genetic abnormality is the cause for abortion, congenital anomalies and inheritance of certain disorders. Traditionally, hereditary conditions have been considered under the headings of single gene, chromosomal and multifactorial disorders. Single gene disorders include Huntington disease, Muscular dystrophy, Neurofibromatosis, Marfan syndrome etc. Chromosomal abnormalities can cause Down's syndrome, Patau syndrome, Klinefelter's syndrome, Turner's syndrome, recurrent miscarriages. Multifactorial genetic diseases include Diabetes

mellitus, Crohn disease, Hypertension, Coronary heart diseases, Schizophrenia etc.

Over the past decades, prenatal diagnosis-the ability to detect abnormalities in an unborn child has been widely used. The techniques used in prenatal diagnosis are Amniocentesis, Chorionic villus sampling, Ultra sonography, Cordocentesis etc³¹. In some diagnosed genetic diseases pregnancy need to be terminated, but some can be treated in utero effectively.³² Along with the concept of Garbhotpadaka Samagri, Prakruthi genomics provide a wider platform for Predictive, Preventive and personalized aspects in medicine.³³

CONCLUSION

The proper fertile period, parental age, healthy uterus, good nutrition and undiseased gametes will definitely lead to a healthy offspring. The understanding of Garbhotpadaka Samagri and its applied knowledge can be used definitely to diagnose and treat the infertile couples, for regular antenatal check up to screen IUGR and genetic disorders. It is well said in Ayurvedic classics, the child produced by the proper union of the Garbhotpadaka saamagri will be good looking, strong minded, long living and helpful to their parents and society.

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