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Role of preconceptional diet according to *Ayurveda*: a critical analysis

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ABSTRACT:

Preconception nutrition is a vital part of preparing pregnancy. Malnutrition can adversely affect the division and replication of cells in the embryo at pre-implantation stage in which cells divide and replicate most rapidly. It may cause restricted fetal growth, LBW, missed abortion, congenital anomalies etc. In present era faulty life style, dietetic habit, environmental factors contribute in lowering the fertility rate in male as well as females. Nutritional diet before, during and after pregnancy is very important for healthy progeny. Ayurveda describes specific diet for male and female under the title *garbhadhansanskar* for healthy baby. Recent studies also show that the nutrition and fertility is linked to both the male and female.

Key words: *Ayurveda, garbhadhansanskara, nutrition, fertility.*

INTRODUCTION:

Planning for a baby is such a lovely experience for both mother and father. It is a part of real fulfillment of married life. According to Ayurveda proper preparation is an essential prerequisite for a healthy progeny. Sushrut samhita, one of the Ayurveda's prime texts describes that a co-ordination of four factors of *ritu* (proliferative phase including ovulation), *khsetra* (healthy womb /female reproductive system), *ambu* (nutritional elements of the body), *beeja* (healthy sperm and ovum) and proper observance are necessary for the conception and development of a healthy child just as proper season (*ritu*), good soil (*khsetra*), water (containing nutrient matter) and vigorous seeds (*beeja*) together with proper care, helps in germination of strong and

undiseased sprouts. A child which is a fruit of such conception is destined to be beautiful of vigorous health, generous, long lived, virtuous, and attached to the good of its parents and capable of discharging its parental obligation¹. Lacuna in above four factors definitely contribute in lowering the fertility or complicated pregnancy, missed abortion, congenital anomalies etc. So to overcome such complication our stalwarts indicate special food for male and female before conception.

Maharshi Sushruta opines that a man should properly lubricate his body with *ghrita* then partake food composed of boiled shali rice with *ghrita* and milk and then visit the bed of his wife who has lubricated her body with oil, partake food largely composed of oil and *Masha* pulse and then meet her husband at night². Maharshi Charaka also mentioned that the man should use *ghrita* and milk medicated with the drugs of *madhura varga* (sweet/anabolic drugs) and the woman should consume oil and *Masha* after the purifying measures and before coitus³. Vagbhata II has specified *ghritas* as *phalaghrita* and *mahakalyanaka ghrita* for woman; commentators have explained that the *madhura* drugs increase *shukra* and *pittala* drugs *rakta*.

AIM

1. To establish the effect of diet described in classics before conception on fertilization and pregnancy outcomes

OBJECTIVES

1. To ensure a normal pregnancy and delivery of a healthy baby without any obstetric complications.

MATERIAL AND METHODS

Ayurvedic literature regarding *garbhadahansanskar*, *garbhini-paricharya* (antenatal care) and its importance before and after conception was searched thoroughly. Similarly its effect on fetal well being was also studied. Other books, research journals and publications related to the topic were also reviewed. Books related to pharmacology of *Ayurvedic* drugs and related research papers also searched for their mode of action. Other research journals, papers, books related to infertility, conception, pregnancy are also explored to collect the matter.

DISCUSSION

Recent studies illustrate that nutrition and lifestyle factors play a critical role in the normal function of the reproductive system⁴. *Ayurveda* indicates *ghrita*, milk, shali rice, *madhura* varga drugs specially for male where as *taila* (tila taila/sesame oil), *Masha (urad daal)* in female before conception. The drugs described for male are *madhura* (sweet), *snigdha* (unctuous) and *sheeta* (cold) quality and *shukra* is also homogeneous with the drugs on the basis of qualitative aspect. Similarly the drugs described for female are hot in potency which is homogeneous with the property of *artava* i.e. *aagneya* property.

Diet for male

Ghrita-The *ghrita* described in classics is cow *ghrita*. It is the best in all unctuous substances. Cold in potency and sweet in taste as well as *vipaka*. It improves memory, intelligence, digestive fire, semen, *oja*, *kapha* and *meda*. Allivates *vata*, *pitta* and *visha* (toxic condition)⁵, useful in painful condition of female genital tract⁶.

The *ghrita* contain significant level of vitamin A, E, D, B12, high amount of DHA which is the most popular omega 3, omega 6 fatty acid conjugated with linoleic acid and butyric acid, small amount of **Vitamin K**:

Vitamin A is an essential factor for spermatogenesis. Its deficiency causes replacement of the epithelia of epididymis, prostate and seminal vesicle by stratified squamous keratinizing epithelium⁷ and decreased testosterone production. Recent studies have shown that retinoids affect the three types of cell i.e. sertoli, germinal and Leydig cells in fetuses⁸. Approximately 30-80% of infertility cases are caused by oxidative stress and decreased level of seminal total antioxidant capacity. Vitamin E is very good antioxidant, it reduces the sperm DNA damage, improves the number, motility,

morphology and sometimes DNA integrity of sperm. It neutralizes free radicals and protects cellular membrane against O₂ free radicals. It protects sperm from ROS, also prevents lipid peroxidation and therefore improves functions of other antioxidants. It inhibits production of ROS in infertile man⁹. Nutritional deficiency contributes to male infertility¹⁰.

Dr Elisabeth Lerchbaum, from medical university of Graz, has led much research on the effect of vitamin D supplementation in different aspects of male and female fertility. Vitamin D supplementation can improve semen quality, fertility outcomes and testosterone concentrations. Recent studies suggest that Vitamin D supplementation could be beneficial for couples undergoing IVF (European society of endocrinology May 23, 2017). Studies show that Vitamin D with Vitamin K2 (menaquinone a form of vitamin K) work in tandem relationship to improve metabolic health. K2 boosts testosterone by steroidogenesis. It is also found in gonadal tissue. The diet which boosts their levels finds dramatically higher testosterone level¹¹.

Vitamin B12 also has the positive effect on semen quality in primarily increasing sperm count and secondarily enhancing sperm motility and reducing sperm DNA damage¹². In human there is a strong correlation between sperm motility and sperm membrane DHA concentration¹³. DHA plays a role in the formation of a structure called the acrosome of the head of the sperm. Acrosome is the pointy cap like structure containing enzymes that break through the egg's outer layer enabling the sperm to fertilize it. Without DHA membrane fusion doesn't happen. If the vesicle doesn't fuse, the acrosome doesn't get made and sperm maturation halts¹⁴.

Madhur varga dravyas- This class consists of the drugs which are *madhura* (sweet) in taste, *snigdha* (unctuous), *sheeta veerya* (cold in potency). The drugs are congenial to the body, improves *rasa* (body fluid), *rudhira* (blood), *mamsa* (muscles/flesh), *meda* (fat), *asthi* (bones), *majja* (bone marrow), *shukra* (semen), *ojus*, improves life expectancy, soothing the six sense organs, improves strength, immunity, and skin complexion. They balance *pitta*, toxicity and *vayu*¹⁵.

Shali rice (oryza sativa)-These type of corn are cold in potency, sweet in taste as well as *vipaka* (taste conversion after digestion). They improve the body weight, increase sperm production, diuretic, balances all

three doshas¹⁶. *Rakta shali* is the best variety of shali rice. It is a good source of vitamins and minerals such as magnesium, selenium, copper, niacin, thiamin, iron, riboflavin, calcium, possesses high fiber and lesser amount of sugar content. These are rich in antioxidants, higher level of proteins with well balanced amino acids and higher contents of fat, vitamin E¹⁷. Vitamin E is the best antioxidant for the removal of oxidative stress in the male reproductive system. The use of selenium and Vitamin E has the synergistic effect. The deficiency of these leads to degeneration of germinal epithelium and Leydig cells in seminiferous tubules. They enhance the functions of testes and epididymis by increasing their weight¹⁸. Calcium is crucial regulator of many physiologic process in every living cell, including spermatozoa. Ca²⁺ is the trigger of the acrosome reaction in mammalian spermatozoa, it is differentially involved in sperm motility on the stage of sperm maturation. The prostate, seminal vesicles and epididymis are also very rich in calcium¹⁹. Magnesium may play a role in sperm motility. It is a marker in seminal vesicle secretions and acts as an intracellular calcium antagonist²⁰. There is evidence that zinc in seminal plasma influences sperm oxygen consumption²¹, nuclear chromatin decondensation²², and acrosin activity²³. Zinc deficiency causes hypogonadism²⁴ and it is thought to be important in the stabilization of sperm chromatin²⁵. The ionic form of copper (Cu⁺) is highly toxic for sperm. The only way copper normally enters mammals and other terrestrial vertebrates is via alimentary tract. Copper is an important element for numerous metalloenzymes and metalloproteins that are involved in energy or antioxidant metabolism²⁶.

Iron is essential for many metabolic process including DNA, RNA, and protein synthesis, formation and maintenance of myelin. Physiological level of iron is required for normal spermatozoa production. In general semen contains certain amount of Fe, and Fe content of seminal plasma is important for the preservation of sperm motility and viability after ejaculation, its presence in seminal plasma helps spermatozoa to maintain their functions. Study shows that after correction of iron deficiency anemia there is significant enhancement of sperm parameters coupled with increased serum concentration of testosterone, LH, and FSH²⁷.

Diet for female

Taila- *Taila* indicates *tila taila* i.e. sesame

oil. *Maharshi Charaka* opines that of all varieties of oil sesame oil is best for improving strength and imparting oiliness of the body²⁸. He describes the properties of taila that it pacifies vata, and improves strength, hot in potency, cleanses genital organs²⁹. The sesame is *snigdha* (unctuous), *ushna* (hot in potency), *madhura* (sweet) *tikta* (bitter), *kashay* (astringent), *katu* (pungent) in taste. It is good for skin, hairs, improves strength and immunity, aggravates pitta and kapha, vyavayi (undergoes chemical change after it is pervaded all over the body)³⁰.

As per *Bhavaprakasha* black variety of the sesame is best than the white. It is shukrala, and contains more calcium, vitamin K, magnesium, copper, phosphorus, iron, zinc and vitamin B1³¹. It is rich in vitamin E hence acts as a natural antioxidant and prevents cellular damage. It helps to increase endometrial thickness, glandular epithelial growth, development of vascular endothelial growth factor protein expression in the endometrium³² and makes a bed to implant the embryo, healthy amniotic sac, hormonal balance, prevents premature rupture of membrane. Vitamin E has been able to decrease miscarriage rate and to increase IL-6 placental levels, while increasing VEGF (vascular endothelial growth factor) placental levels³³, able to avoid an inflammatory condition of endometrium which is one of the cause in a low embryo implantation rate and allow viability of embryo³⁴. Vitamin E deficiency during pregnancy may cause miscarriage, preterm birth, pre-eclampsia, and IUGR (intrauterine growth restriction)³⁵. It improves uterine radial artery blood flow, endometrial thickness and may be useful for the patients with a thin endometrium³⁶. Decreased concentration of phosphorus, magnesium, calcium may be a cause of threatened abortion³⁷ so the diet rich with these vitamins will definitely improve fertility rate and helps in implantation. Low Vitamin K level leads to higher miscarriage rates and birth defects³⁸, it boosts insulin sensitivity. Supplement of zinc restores the fertility³⁹, its deficiency in pregnant experimental animals limits fetal growth and if severe, causes teratogenic anomalies. Transfer of sufficient zinc to the fetus is dependent on maintenance of normal maternal serum zinc concentrations⁴⁰. Northern scientists, working with mice discovered that healthy eggs need a tremendous amount of zinc to reach maturity and be ready for fertilization.

Zinc helps the egg exit from a holding pattern to its final critical stage of development⁴¹.

Masha (urad daal/black gram/vigna mungo)-It is excellent aphrodisiac, pacifies vata, hot in potency, uncutuous, sweet in taste, guru i.e. heavy to digest. It improves strength, bulk of feces and fertility quickly⁴². It contains small amount of isoflavones, excellent source of B-complex vitamins such as B6, thiamin, pantothenic acid, riboflavin and niacin, folates. Folates along with vitamin B-12 is one of the essential factor for DNA synthesis and cell division. Urad beans also incredible sources of minerals like iron, calcium, copper, magnesium, zinc, phosphorus⁴³.

Adequate folate diet around conception and during pregnancy may help to prevent neural tube defects (NTD)⁴⁴. NTD stands for spina bifida, anencephaly, iniencephaly, cephalocoele in the fetus. The cause of these anomalies is failure of spinal cord to properly develop together with their protective shield of skull and spine, around the 4th gestational week. Supplementary intake of folic acid during preconception period and throughout pregnancy has a preventive effect on its recurrence. Inadequate intake of folic acid is also connected with preterm delivery, intrauterine growth restriction, placental abruption and infarction⁴⁵.

CONCLUSION:

Ancient stalwarts of Ayurveda were really much aware about the maternal care and healthy progeny. They describe diet before conception for male and female which is homologous to the properties of shukra and aartava respectively. According to *Ayurvedic* principle *samanena samanasya vridhhi* this diet is helpful to improve semen parameters as well as ovulation and the factors responsible for conception. It is rich with various vitamins and minerals which are essential to improve fertility, ovulation, and proper environment for embryo. Healthy and balanced diet will help to boost fertility levels. At present clinical trials and interventions trials have suggested that dietary supplementation with several nutrients may improve health outcomes for mother and offspring. Some studies have found a number of apparent benefits from taking prenatal vitamins, including reductions in heart, neural tube and other birth defects. The same thing is described by Ayurveda thousand years ago through dietary supplement. However further study is very much necessary to prove this fact.

REFERENCES:

1. Sushrut samhita, sharirsthana2/33, Poorvardha, By Kaviraj Ambikadutt Shashtri.Chakhambaha Publication Edition Reprint 2007.
2. Sushrut samhita,sushrut sharirsthana 2/28. By Kaviraj Ambikadutt Shashtri.Chakhambaha Publication Edition Reprint 2007.
3. Charaka samhita sharirsthana 8/4,7. Poorvardha by Priyavrat Sharma. Chaukhambha Sanskrit Sansthan Varanasi, Reprint 2007
4. Braga DP, Halpern G, Figueira RC et al. Food intake and social habits in male patients and its relationship to intracytoplasmic sperm injection outcomes. Fertil Steril 2012;97:53-59[pub Med]
5. Charak samhita sutrasthana 232/27,14/13 pg no 183 Poorvardhaby Priyavrat Sharma Chaukhambha Sanskrit Sanstan Varanasi ,Reprint 2007
6. Charak samhita sutrasthana 233/27 Poorvardhaby Priyavrat Sharma Chaukhambha Sanskrit Sanstan Varanasi ,Reprint 2007
7. Wolbach S.B., Howe P.R. Tissue changes following deprivation of fat soluble A vitamin. J. Exp. Med 1925;42:753-777[Pub Med]
8. Livera G, Rouller-Fabre, Pairault c, Levacher C, Habert R Regulation And Perturbation of Testicular Function By Vitamin A, Reproduction. 2202 Aug ;124(2):173-80[Pub Med].
9. Sedigheh Ahmadi, Azadeh Nadjarzadeh. Antioxidant supplements and semen parameters :an evidence based review Int. J Reprod Biomed 2016, Dec 14(12):729-736
10. Wong WY, Thomas CM, Merkus JM, Zilhuis GA, The male Factor Subfertility, Possible Causes And The Impact of Nutritional Factors . Fertil Steri 2000,73:432-442 [Pub Med].
11. Hitoshi Shirakawa, Michio Komai, Vit. K Deficiency Reduces Testosterone Production Through Down Regulation Of The Cyp-11 A A Cholesterol Side Chain Cleavage Enzyme In Rats. Biochem Biophys Act A 2006 Oct,1760(10):1482-84. Epub 2006 Jun 6
12. Salim Ali Banihani. Biomolucules. 2017 Jun;7(2):42.

13. Mohammad Raza, Safarinejad And Shiva Safarinejad Asian J Androl.2012 Jul 14 (4):514-515,Doi-10.1038/Aja-2012.46
14. Jennifer Welsh, Omega-3s Vital For Sperm Health Jan 12,2012.
15. Charak Samhita, Sutrasthana 42/26pg No 345,Poorvardhaby Priyavrat Sharma Chaukhambha Sanskrit Sanstan Varanasi ,Reprint 2007.
16. Charak Samhita, Sutrasthana 8-10/27pg No 369 , Poorvardha by Priyavrat Sharma Chaukhambha Sanskrit Sanstan Varanasi ,Reprint 2007.
17. .Gunaratne A,Wu K,Li D,Bentota A,Corke H,Cai Yz Antioxidant Activity And Nutritional Quality Of Traditional Red Grained Rice Varieties Containing Proanthocyanidins.Food Chem. ,2013 Jun 1;138(2-3):1153-61.Doi:10.1016
18. Muhammad Zubaireffects Of Dietary Vitamin E On Male Reproductive System. Asian Pacific Journal Of Reproduction (2017)145-150
19. Wy Wong Gert Flik, Pascal M.W And Others .The Impact Of Calcium, Magnesium, Zinc Copper, In Blood And Seminal Plasma On Semen Arameters In Men. Reproductive Toxicology 15(2001)131-136
20. Abou-Shakra Fr,Ward Ni,Everard Dm.The Role Of Trace Elements In Male Infertility,Fertile Steril 1989;52:307-10
21. Eliasson Rjohnson O , Lindholmer C. Effect Of Zinc On Human Sperm Respiration. Life Sci I 1971;13:129-49
22. Kvist u,sperm nuclear chromatin de-condensation ability. An in-vitro study on ejaculated human spermatozoa.acta physical scand suppl 1980,486:1-24
23. Steven Fs, Griffin Mm,Chantler En, Inhibition Of Human And Bovine Sperm Acrosin By Divalent Metal Ions.Possible Role Of A Zinc As A Egulator Of Acrosin Activity Int J Androl 1982;5:401-123
24. Sandstead Hh, Prasad As, Schulert Ar, Et.Al. Human Zinc Deficiency, Endocrine Manifestation And Response To Treatment.Am J Clin Nutr 1967;20:422-42
25. Kvist U, Kjellberg S, Bjorndahl L, Soufir Jc, Arver S, Seminal Fluid From Men With Agenesis Of The Wolffian Ducts; Zinc Binding Properties And Effects On Sperm Chromatin Stability .Int J Androl 1990;13:245-52)
26. Wy Wong Gert Flik, Pascal M.W And Others .The Impact Of Calcium, Magnesium, Zinc Copper, In Blood And Seminal Plasma On Semen Arameters In Men. Reproductive Toxicology 15(2001)131-136
27. Ashraf Soliman Mohammad Yasin,Vincenzo De Sanctis Intravenous Iron Replacement Therapy In Eugonadal Males With Iron Deficiency Anemia; Effects On Pituitary Gonadal Axis And Sperm Parameters; A Pilot Study Indian J Endcr And Metabolism, Vol 18.No.3, May-June 2014 Pp 310-316
28. Charak Samhita, Sutrasthana 12/13/pg No 182 ,Poorvardhaby Priyavrat Sharma Chaukhambha Sanskrit Sanstan Varanasi ,Reprint 2007
29. Charak Samhita, Sutrasthana 15/13pg No 183 ,Poorvardhaby Priyavrat Sharma Chaukhambha Sanskrit Sanstan Varanasi ,Reprint 2007.
30. Charak Samhita, Sutrasthana 30/27pg No 373 ,Poorvardhaby Priyavrat Sharma Chaukhambha Sanskrit Sanstan Varanasi , Reprint 2007.
31. www.whfoods.com
32. Takasaki A,Tamura H,Miwa I,Taketani T, Shimamura K,Suginon Endometrial Growth And Uterine Blood Flow : A Pilot Study For Improvement Of Thickness In The Patients With A Thin Endometrium. Fertile steril 2010 apr;93(6):1851-8,doi 10.1016/j.fertnstert.2008.12.062.Epub 2009 feb 6
33. Junovich G, Dubinsky T, Gentile T, Sarto A, Pasqualini S, Gutierrez G Comparative Immunological Effect Of Anticoagulant And Antioxidant Therapy In The Prevention Of Abortion In Mice Am J Reprod Immunol,2011 Feb;65(2):104-9.doi:1111/j.1600-0897.2010.00896.x[Pub Med]
34. Mayorga M, Iborra A,Estany S, Martinez P. Protective Effect Of Vitamin E In An Animal Model Of Lps Induced Inflammation. Am J Reprod Immunol,2004,dec,52 (6) :356-61[Pub Med]

35. <http://www.ncbi.nlm.nih.gov/gangne> a,wei sq,fraser wd, julien p .absorption, transport and bioavailability of vitamin e and its role in pregnant women J Obstet gynaecol can,2009 mar,31(3):210-7[Pub Med]
36. Takasaki A,Tamura H,Miwa I,Taketani T, Shimamura K,Suginon Endometrial Growth And Uterine Blood Flow : A Pilot Study For Improvement Of Thickness In The Patients With A Thin Endometrium. Fertile steril 2010 apr;93(6):1851-8,doi 10.1016/j.fertnstert.2008.12.062.Epub 2009 feb 6
37. (Smolarczyk R, Romejko E, Wojcicka-Jagodzinska J, Pekala M, Piekarski P, Czajkowaski K,Teliga-Czajkowaska J, Kuczynska-Sicinska J Calcium-Phosphorus-Magnesium Homeostasis In Women With Threatened Abortion Ginecol Pol ,1997 Jan ;68(1):11-6[Pub Med]
38. Vitamin K and miscarriage <https://sites.google.com>
39. el-darawany a-high and low litter size trait and its relationship with serum and urine progesterone, serum zinc, and serum phosphorus in new Zealand white rabbits and improvement for the low litter size trait , beitr trop landwirtsch veterinarmed,1992;30(4):451-62
40. King Jc.Determinants Of Maternal Zinc Status During Pregnancy.Am J Clin Nutr, 2000 May; 71 (5 Suppl)1334s-43s.doi..10.1093/ajcn/71.5.1334s.
41. <https://www.sciencedaily.com/august> 9,2010.source-Northwestern university
42. Charak Samhita,Sutrasthana 24/27pg No 371 ,Poorvardhaby Priyavrat Sharma Chaukhambha Sanskrit Sanstan Varanasi ,Reprint 2007
43. <https://www.nutrition-and-you.com>
44. prevention of neural tube defects:results of the medical research council vitamin study.mrc vitamin study research group authors.lancet.1991;338:131-137.[Pub med]
45. Novakov-Mikic A,Vejnovic T,Ivanovic L,Budakov D-Folic Acid In The Prevention Of Neural Tube Defects Med Pregl.1999 Nov-Dec;52(11-12):509-14; [Pub Med] <https://www.ncbi.nlm.nih.gov>

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