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CONCEPTUAL STUDY OF GARBHA POSHANA WITH SPECIAL REFERENCE TO ANATOMICAL STRUCTURES INVOLVED IN FOETAL NOURISHMENT

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ABSTRACT

Ayurveda (ancient science of life) describes basic principle – "Swasthasya Swasthya Rakshanam Aturasya Vikar Prashamanam". Swasthya i.e. physical, social and mental well-being of individual depends upon the Prakruti which is been formed during garbhavastha (intra uterine life). Wellbeing of garbha can be achieved only through proper nutrition taken by mother. Nutrition helps to foetus for his optimal growth and development for healthy outcome in later life. Inadequate or hampered nutrition to mother may end in abortion, IUGR or foetal abnormalities. Ayurveda focuses over garbhaposhana (foetal nourishment) aided by Apara (placenta) and Nabhinadi (umbilical cord). Here is the comparative study is done regarding foetal nutrition providing structures.

KEYWORDS: Foetal nourishment, Placenta, Umbilical cord, Apara, Nabhi nadi, Garbha poshana.

INTRODUCTION

Embryology in Ayurveda describes in terms of Garbhasharir. Ayurveda gives importance to the quality of seed (beeja i.e. sperm and ovum) and concept of conception is compared with planting of tree as for proper growth of tree which needs healthy nourishment. "Garbha is union of shukra, shonit & aatma". After the union of these garbha started the vrudhi that is the masanumasik vrudhi which is from prathma mas to navam mas. In this duration of nine months, garbha require the essential nutrition that is as called the poshana. This begins in the

mother's womb. The foetus from the time of fertilization till its birth receives nutrition and care from its mother. Ancient Ayurvedic physicians (acharyas) proposed two concepts namely the concept of garbha poshana (foetal nourishment) and the concept of garbha matrupartantrata (dependency of child on its mother for its proper growth and development). As the garbha (foetus) formed in garbhashaya (uterus), the developing cells need oxygen and nutrients which are received from the mother through the endometrium, placenta (apara) and umbilical cord (garbha nabhinadi). Ayurvedic classics also explores about the role of apara (placenta) and garbhanabhi nadi (umbilical cord) in foetal nourishment. According to Ayurveda garbhaposhan is described in two stages, one is before formation of apara (placenta) and second after apara (placental) formation. In this duration of nine months of intrauterine life, garbha requires the essential nutrition that is called poshana. According to Acharya charaka, essence of food (rasa) taken by mother is divided into three parts, First nourishes her body (swa-sharir pushti), the second promotes her breast milk (stanya) and third nourishes the foetus(garbha vriddhi). Modern science also mentioned that nutrition to foetus from mother occurs through two circulations namely–placental circulation and foetal circulation. So, in this article, we will study the concept of garbha poshana and its correlation with the modern anatomical structures.

AIM AND OBJECTIVES

To analyze the concept of Garbhaposhana on the basis of ancient Ayurvedic and modern literature with special reference to anatomical structures involved in foetal nourishment.

MATERIALS AND METHODS

References from Ayurveda literary works such as chapters from Charaka Samhita- Sharir Sthana, Sushrut Samhita- Sharir Sthana and Ashtanga Samgraha- Sharir Sthana as well as from modern anatomy literatures were collected, reviewed and analyzed.

REVIEW OF LITERATURE

Ayurvedic Review

According to Acharya Susrutha the umbilical cord is attached to the rasavaha nadi (maternal part of the placenta) of the mother and this carries ahara rasa virya (nutrition) from the mother to the fetus. Aahara rasa forms the ambu part of the garbhotpatti samagri (Ritu, kshetra, ambu and bija). The fetus grows by this indirect supply of nutrition. From the initial stageof foetus i.e. from conception until the different parts of the body and their subdivisions have got manifested, the embryo gets nutrition from the tiriyak gata (obliquely running)

rasavaha dhamanis (vessels carrying rasa) which course through all parts of the body and imparts life to the embryo. The growth and development of the foetus takes place by means of the garbha Nabhi nadi, which serves as a channel for the rasa (lymph-chyle) formed in the mother's body. This nourishment of the foetus from the mother's body begins as soon as the foetus becomes endowed with life and continues up to the time when the child ceases to be connected with the mother. The foetus receives all the nourishment it needs from the metabolic products of the mother and also breathes and sleeps in unison with the mother.

According to Acharya Charaka the foetus is free from thirst and hunger. The garbha is dependent upon the mother for all its activities. The foetus is nourished by the process of upasneha (exudation) and upasweda (thermo-regulation). Some of the organs are well manifested and some others are not so, the foetus draws nourishment by the process of exudation, sometimes through the romakupa (hair follicles) and sometimes through the channels of umbilical cord. The umbilical cord of foetus is attached to the umbilicus on one side and placenta on the other. The placenta is in turn connected with the matru hrdaya (mother's heart) via syantana sira (pulsating vessels). The matru hrdaya is said to flood the apara with rasa with sarvarasa (all taste) which promotes bala (strength) and Varna (complexion) of the foetus. Being supported by that food, the foetus is dependent upon the mother keeps living inside the uterus. Situated inside the uterus, the foetus sleeps when mother sleeps and is awake when she is awake, the activities of the foetus is not independent, from the time of conception it is dependent for its moistness and dryness upon the food of the mother. When all the organs and parts of the foetus become manifested, a tube connecting the umbilicus of the foetus with the apara which is in turn gets connected with the mother's heart is formed. The nutrient portion of the food travels from the mother's heart carried through the dhamanis and reaches the apara and from there to the Nabhi. Then it goes to the pakwaashaya (intestine) where it undergoes further digestion by kaya Agni (digestive juices). Comprised mainly of nutritive materials rasa nourishes all the tissues. Rasa also oozes out through the hair follicles to form the fluid outside the foetus.

In Ashtang Hridaya, the process of nourishment is explained with the example of Kedara eva kulya nyaya (irrigation of a cornfield by means of numerous canals) which can be reffered to the systemic foetal circulation. According to Vagbhata in Aṣṭāṅga Hrdaya, during the 3rd month of gestation manifestation of gaatrapanchaka (5 parts of body) as well as sarvasushma-anga (all minute organs) starts. A tube connecting the Nabhi (umbilicus) of the foetus with

hrdaya of the mother develop which is responsible for the passage of matru ahara rasa (essence of mothers food) resulting in the nourishment of the foetus.

Modern Review

As per modern science, foetus is union of human egg and sperm that is called as the fertilization. This fertilized ovum get implanted in the endometrium with formation of germ layer of foetal development. Nutrition of foetus according to modern science is mentioned to from different sources depending on its various stages of development. This can be categorized in 3 states as follows:- After fertilization till the completion of implantation, after implantation till the formation of placenta and after the formation of placenta. After fertilization the zygote formed undergoes cleavage during this stage the growing embryo receives nutrition from the contents of cytoplasm of the ovum. Also as the growing embryo which is travelling from the site of fertilization to the site of implantation is lubricated and nourished by the uterine tube secretions through diffusion. As the process of implantation commences the secretions from the trophoblast cells contribute the nourishment of the embryo. After implantation the nutrition for the embryo is mainly by the secretions from the trophoblast cells which get collected inside the yolk sac. After the formation of placenta the foetal circulation is established. Placenta provides the growing embryo with nutrition and with oxygen.

After placenta formation get nourished through the circulation from placenta to foetus – foetal circulation. Circulatory system of mother is not directly connected to that foetus, so the placenta function as the respiratory centre for the foetus as well as site of filtration for the plasma nutrients and waste through the umbilical cord which contain- Two umbilical arteries and one umbilical vein. Arteries are return de- oxygenated blood, foetal waste, Co_2 to placenta. Oxygenated blood and nutrients provide foetus by umbilical vein.

Circulation after birth changes occurs in

1) Pulmonary circulation –lungs functional and
2) Systemic circulation –placenta removed

Three shunts present in foetal life--

1. Ductus venosus- connect the umbilical vein to the inferior vena cava
2. Ductus arteriosus- connect the main pulmonary artery to the aorta
3. Foramen ovale - anatomical opening between the right and left atrium.

Development of healthy foetus and to prevent the nutritive anomalies of the foetus, Acharya mentioned Garbhini Aharparichrya and also importance of Garbhini Ahar rasa in Ayurveda in terms of masanumasik ahar.

If we compare the concept of grabhaposhan and foetal nourishment explained in Ayurveda and modern science, similarity related to dependency found.

AYURVEDA	MODERN
Matruhrdya	Maternal blood from heart
Rasvahininadya	Vessels from mother heart
Nabhi	Foetal umbilicus
Nabhinadi	Umbilical cord
Aapra	placenta
Garbhasharir	Foetal circulation
Upsneha	Amniotic fluid(consist of water, glucose, albumin, Na, urea, lipid etc.)
Upsweda	Proteolytic activities of trophoblast and tropholytic activities of chorionic villi provide nourishment to the blastocyst.
Rasvahanadi	Maternal part of the placenta

S No	In Ayurveda	
1.	Charak samhita	By Upsneha and Upsweda
2.	Sushruta Samhita	By upsneha, Ras-nimitta
3.	Ashtanga Samgrah	By Upsneha and upsweda
4.	Ashtang hridaya	By kedarikulaya nyaya
5.	Bhel samhita	By kedarikulya nyaya
6.	Bhoja samhita	By kedarikulya nyaya

RESULT

All the bhrihatrayees have explained the relation between the child and mother is the formers dependency on the latter for its nourishment through aahara rasa and a save environment for its development inside the uterus. In the modern embryology, the fetus receives nourishment by means of cytoplasmic contents of ovum, trophoblast cells, uterine secretions and placenta.

DISSCUSSION

Since the foetus is completely dependent on the mother for nourishment, if there is any improper food intake by the mother, it may directly affect the foetus. This may end up in Garbhasrava (Abortion), Garbha shosha, Upavishtaka, Nagodara (Intra uterine growth restriction), Mrutagarbha (Intra uterine foetal death) and Vikruta garbha (Congenital malformation).

Modern science also explains certain conditions which are caused due to improper foetal nourishment.

1. **IUGR (Intra uterine growth restriction):-** The maternal cause includes deficiency of critical substrate such as glucose, amino acids and oxygen to the mother. Placental causes include case of poor uterine blood flow to the placental site for long time.This can be due to Placental pathologies including Placenta previa, Abruption, Circumvallate, Infarction and Mosaicism.
2. **Intra uterine foetal death:-** Deficiency of Iron, Folic acid, Vitamin B12 and protein will lead to hypoxemia which can lead to foetal death.
3. **Congenital malformation:-** Maternal intake of alcohol, drugs and malnutrition will lead to congenital malformation. To fulfil the optimal nutrition to the foetus and the mother, Ayurvedic classics explores about Masanumasika garbhini paricharya i.e. month wise dietic regimen for the pregnant mother. From the first day of conception itself the pregnant has to have palatable food with predominance of liquid, sweet, unctuous food processed with appetising materials. By proper following these regimens, woman delivers the child possessing good health, strength, all the good qualities and long life.

CONCLUSION

Nourishment plays an important role in healthy growth of the foetus. The concept of Garbha poshana (foetal nourishment) explained in Ayurvedic classics holds good in parlance with modern science. The deficiency conditions, placental and umbilical cord abnormalities which can lead to the improper nourishment of the foetus should be diagnosed in the early pregnancy and should be treated accordingly. Masanumasika garbhini paricharya (month wise dietic regimen) explained in Ayurvedic literature should be followed by the pregnant woman to get a healthy offspring.

Grabhaposhan is one of the important factors responsible for grabhaparivruddhi. Matruhryday, Nabhinadi, Rasvahini are the directly involved structures whereas Apara is indirectly mentioned in process of grabhposhana. Almost all structures found to be foetus this concept was elaborated with keen observation in Ayurveda same as that of modern science.

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