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Ayurveda

IMPACT OF SATTVAJA BHAVAS IN NEUROCOGNITIVE DEVELOPMENT OF GARBHA : A REVIEW

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ABSTRACT The formative period of the intrauterine life is considered to be very much crucial in shaping the foundation of an infant's physical, cognitive and the neurological developmental. Ayurveda outlines the importance of the Shad Garbhakara bhavas and the pivotal role of Sattvaja Bhavas in supporting healthy foetal growth, maternal wellbeing and optimal Garbha Bala. The classical Ayurvedic textbooks emphasizes not only to ensure uncomplicated childbirth but also to nurture higher neurocognitive faculties like Medha, Smriti and Buddhi of the Garbha.

KEYWORDS : Intrauterine Life, Shad Garbhakara Bhavas, Sattva, Foetal Psychology, Neurocognitive Development

INTRODUCTION

According to Ayurvedic texts, a woman's health during pregnancy significantly influences the child's development, personality, and future well-being. The intrauterine phase of life is increasingly known to be the critical period that shapes the physical, neurological and psychological makeup of an individual. From conception to the birth, foetus undergoes various processes of cellular differentiation, synaptic formation and neurochemical maturation. The Ayurveda acharyas developed a precise protocols under Garbhini Paricharya which included Ahara, Vihara, Aushadha and Manovyapara to ensure a healthy offspring. Samhitas provides a detailed specific month – wise guidelines that corresponds to the sequential development of foetal organs. These references states beyond the basic survival and address the quality of life, intelligence, memory, sensory accuracy and the emotional balance of the future offspring.

AIMS & OBJECTIVES

- To understand the role of Shad Garbhakara Bhavas in the Garbha.
- To understand the impact of Sattvaja Bhavas in the Garbhakala.
- To study the psychological changes during pregnancy.
- To understand the association between the maternal stress and the epigenetics of foetus.

MATERIALS

Classical literature of Ayurveda as well as modern medical science on the subjects of Prasoothi Tantra, Foetal Psychology and Genetics were obtained from the library of the Shri Babu Singh Jay Singh Ayurveda Medical College, Farrukhabad. The data obtained were critically analysed and presented.

METHODOLOGY

This was purely a literary study wherein the explored literature was analysed and interpreted.

Shad Garbhakara Bhavas & its Role in Garbha

As per the ayurvedic concepts of Shareera, each Garbhakara Bhava contributed in the physical and mental growth of various structures and functions of the body. Among the Shad Garbhakara Bhavas, Matrija, Pitruja and Atmaja Bhavas cannot be altered as they are inherited from the parents and Poorvajanma Samskaras, while other Bhavas, namely, Satmyaja, Rasaja and Sattvaja Bhavas when practised can modify the intrauterine environment and the psychosomatic wellbeing of the expectant mother, that can produce a healthy impact on the foetus.[1]

Features Developed From Shad Garbhakara Bhavas (Table .1)

Shad Garbhakara Bhavas	Features
Matrija Bhava	Twak, Rakta, Mamsa, Meda, Majja; Nabhi, Hridaya, Kloma, Yakrit, Pleeha, Vrikka, Vasti, Purishadhanam, Amashaya, Pakvashaya, Antra, Uttara guda, Adhara guda, Kshudrantra, Vapa, Vapavahanam Garbhashaya
Pitrija Bhava	Shukra, Kesha, Smasru, Nakha, Loma, Danta, Asthi, Sira, Snayu, Dhamani & Sthira Angas
Atmaja Bhava	Taasu taasu Yonishu Utpatti, Ayu, Atmajnana, Vigyan, Prerana of Prana & Apana, Swara, Sukha, Dukha, Iccha, Dvesha, Chetana, Dhriti, Buddhi, Smriti, Ahankara, Prayatna, Kama, Krodha, Lobha, Bhaya, Harsha, Dharmasheelata, Upachaya
Satmyaja Bhava	Arogya, Analasya, Alolupatvam, Indriya prasadanam, Svara varna beeja sampat, Praharsha, Veerya, Bala, Medha, Ayu, Ojas, Prabha, Uthana, Santosha
Rasaja Bhava	Sharirasya Abhinivritti, Sharirasya Abhivritti, Prana anubandhata, Tripti, Pushti, Utsaha, Bala, Varna, Sthiti, Hani, Aloulyam, Buddhi, Vritti
Sattvaja Bhava	Bhakti, Sheela, Saucha, Dvesha, Smriti, Moha, Tyaga, Matsarya, Shourya, Bhaya, Krodha, Tandra, Utsaha, Taikshnya, Mardava

According to the contemporary literature, there are 3 phases of the intrauterine growth that includes zygote, embryo and foetus. The factors that affect the intrauterine growth of the foetus are genetic constitution of the foetus, nutritional status of the mother, placental status, uterine capacity, exposure to infections and toxic factors. The zygote phase – period I that consists of cell division and implantation of this cell mass in the uterus, where teratogen would cause loss of the conceptus. During the embryonic phase – period II where most of the organ systems develop is the most vulnerable for major congenital malformations to develop. In the foetal phase in which further growth of the tissues and organs takes place and the factors can result in minor or not so severe defects.

Impact of Sattvaja Bhavas in the Garbhakala

The higher level of intelligence and instinct possessed by human beings is caused by the presence of manas. There are various factors that determine the different psychological faculty of a child, that includes;

- The psychological temperament of the parents
- The time in which the pregnant women lives and the impressions that are received by the expectant mother during gestation.
- The influence of the progeny's previous birth actions or karma
- The frequent desires for a specific type of mental faculty by the progeny in its previous life.

Therefore, the Sattva of the Garbha is moulded by three pivotal contributory factors;

- Sattva of the Parents – Genetic Derivatives
- Garbhini Uparjita Karma – Gestational Derivatives
- Janmantara Vishesha Abhyasa – Environmental Derivatives

Stronger the contributory factor, stronger is its influence over the psychology of the Garbha.1Even though, the presence of mental faculties is observed from the pre-embryonic life and are associated with the embryo since the fertilization, its manifestation tends to happen during the time of development of Indriyas in the Garbha. Thus with the emergence of the Indriya, The Manas of the Garbha begins to feel Vedana or perception and desires for things experienced in the Poorvajanma which is called as Dou-hridya, thus exhibits the relevance of Garbha Uparjita Karma in Garbha.[2] According to the Ayurveda classics, Saumanasya of Manas is given prior importance, the activity of the expectant mother during gestational period up to the delivery will result in the Manobhavas of the progeny.

Dauhrida Avastha of Garbhini is considered to be one of the most prominent manifestation of the Sattvaja Bhava, as the Acharyas have stated the suppression of desires of the Dauhridi may influence the psychology of the mother and foetus.

Relationship Between the Desires of Dauhridi & Characters of Progeny[3] (Table .2)

Desires of Dauhridi	Probable Characters of Progeny
To look at king	Rich, lucky
To wear fine, silk garments & ornaments	Fond of ornaments, beautiful
To live in Ashram	Control over Indriyas, religious
To look at idol of god	Courteous, devotee
To look at snakes, wild animals	Ferocious
To eat meat of Godha	Sleepiness, not expressing one's desires
To drink cow's milk	Mighty, great endurance
To eat buffalo's meat	Red eyes, dense body hair, bold
To eat meat of Varaha	Sleepy, brave, bold
To eat meat of mriga	Swift movement, wanderer
To eat meat of Srimara	Terrified, Anxious
To eat meat of Taittiri	Paltroon

- Role of psychological temperament of Parents: Acharya Charaka has mentioned regarding Sattva Vaisheshyakara Bhavas, where one of them is the Matrija and Pitruja Sattva which is responsible for the psychological makeup of the progeny.[4] Recent research updates states that the antenatal stress and anxiety during 18 weeks of pregnancy has its effect on the foetus, which persists until middle childhood and expresses as dyslexia, hyperactivity and attention deficit disorder.[5]
- Gitau et al. (2001) states that maternal and foetal levels of the cortisol, stress hormone were correlated (r = 0.58), which suggests that the maternal cortisol can cross the placenta and significantly alter the foetal exposure. Another research suggest that elevated maternal anxiety in late gestational period is associated with impaired blood flow or raised resistance index to the foetus, through maternal uterine arteries.[6]

Psychological Changes During Pregnancy

Pregnancy is considered as a transformative biological process and one of the most profound events in the life of a woman. This pivotal phase is marked by drastic physiological changes which aids in culminating in the creation of life.

Emotional Changes

The emotional wellbeing of the mother is mainly influenced by various hormonal changes that takes place in her body during gestation. Estrogen and Progesterone, the 2 pivotal hormones throughout the gestation, exhibits dynamic fluctuations contributing to the spectrum of emotional experiences. Estrogen which is recognized for its mood regulating properties, shows variations that may differ during different trimesters. Progesterone commonly known to be the relaxation hormone plays its dominant role in calming the nervous system.

The emotional landscape of gestation is characterised by its drastic highs and lows throughout the trimesters. The psychological journey of gestation begins from the initial excitement and trepidation of the first trimester to the emotional stability experienced during second trimester and the heightened emotional sensitivity and anticipation in the third trimester.

The marked bodily transformations observed during the pregnancy to accommodate the growing foetus causes various psychological responses to these changes among expectant mothers. The changes involving physical appearances, weight gain and changes in bogy proportions causes complex emotions related to body image.

Cognitive Changes

The Pregnancy is often associated with the term pregnancy brain, where expectant mothers may sometimes report lapses in memory and difficulties in focus and concentration. The individuals were frequently observed with forgetfulness and decreased cognitive sharpness. The cognitive changes during gestation grows beyond the scope of memory and concentration, to decision making processes and the emergence of maternal instincts.

Behavioral Changes

Sleep disturbances are a very common issue during the gestation, which is frequently influenced by hormonal shifts, physical discomfort and anxiety. The cumulative effects of sleep disturbances is often manifested as Fatigue, which influences the mental health of the expectant mothers, that may contribute to mood swings, irritability heightened stress levels.

Behavioral changes also extends its scope to health behaviors and lifestyle adaptations which is stated in Garbhini Paricharya that contribute to maternal and foetal wellbeing. Pregnancy brings about profound changes in dietary preferences often influenced by psychological factors.

Pregnancy Associated Psychiatric Illness

Depressive and anxiety disorders are quite common in gestational period. One in seven women is experiences peripartum depression at some point of their pregnancy or in the first few weeks following childbirth, according to estimates.[7] The majority (40%) of the depressive episodes that are identified after birth start early postpartum, within 4-6 weeks of delivery with many episodes starting before or during pregnancy (26.5%).[8] Genetic factors, earlier mental illness, negative life events, lack of social support are the main risk factors for perinatal depressive disorders. According to a recent systematic review, low educational attainment, living with extended family, multiparity, family history of hyperemesis gravidorum, comorbid sleep disorders are considered as the newly emerging risk factors.

Post traumatic stress disorder can be manifested on by present trauma, like violent encounters, losses or it may be related to previous major trauma such as negative events during pregnancy or delivery experiences that have the potential to re-trigger the PTSD. The rates are remarkably higher among the mothers who have stillbirths or neonatal deaths.

The personality disorders which is present in among 6% of pregnant women are much more deeply rooted and are always associated with persistent patterns of behaviour, as they produce rigid responses to various personal and social settings. The most frequently identified type is commonly seen in the young females, where dysphoria, self-image problems, impulsivity, emotional instability, constant emptiness like feeling, self-destructive behaviour are observed.

There are evidences stating that personality disorders are associated with negative obstetric outcomes that includes premature birth, low birth weight and a APGAR score.[9] Preterm birth has been linked to depression, where the women with major depressive disorder have greater rates of premature birth.[10] Maternal mental illness during gestation has been associated to a number of unfavourable outcomes like preterm delivery, neonatal hypoglycaemia, poor neuro-developmental outcomes and disturbed attachment. Addition to these conditions, perinatal outcomes that include stillbirth, small-for-gestational-age foetuses, foetal distress and placental abnormalities is also exhibited.

Maternal Antenatal Psychological State & its Influence on Foetal Physiology

Foetal Heart Rate

The characteristics of Foetal Heart Rate activity are associated with a range of dysphoric psychological states in pregnant women, including perceived stress, lab induced stress, self reported depression, clinically appraised depression, anxiety disorders and anxio depressive comorbidities. According to a child and adult psychiatry research, lower levels of high frequency heart rate is associated with less adaptive transitions towards the emotional cues response.

Foetal Activity

In addition to FHR, foetal activity, sleep pattern and movement had been observed to be influenced by the psychological status of the mother, suggesting the effect of maternal stress over the development of central nervous system in foetus. When observed with the aid of ultrasound monitor for 5 continuous minutes between 18 and 36 weeks gestation in a study of effects of maternal anxiety and depression on foetal development, foetuses of depressed spend a greater time active compared to the foetuses of the nondepressed mothers. This effect of maternal psychological makeup on foetal activity was further strengthened when measurements of maternal anxiety was concurrently included with the depression, which explained the 35% of the variance in the foetal activity.

Physiological Pathways for Transmission of Maternal Distress to the Foetus

According to various empirical studies, HPA axis and uterine functioning were considered as the potential pathways by which maternal psychological state is transmitted to the foetus. HPA axis is often regarded as the central regulatory system for psychological

distress, where the primary modulator of this axis is corticotropin releasing hormone (CRH), which is released by hypothalamus into hypothalamo-hypophyseal portal system. This portal leads CRH into anterior pituitary gland, stimulating corticotropes and secretes adrenocorticotropic hormone (ACTH).[11] ACTH further stimulates ACTH receptors of adrenal gland and synthesizes glucocorticoids especially cortisol into the bloodstream. During gestation, in addition to hypothalamic CRH, placenta also generates and releases CRH into the blood, causing hyperactivation of the HPA axis which leads to rise in free or bound cortisol, thus reaching the values comparable to Cushing syndrome.[12,13] (See Fig 1)

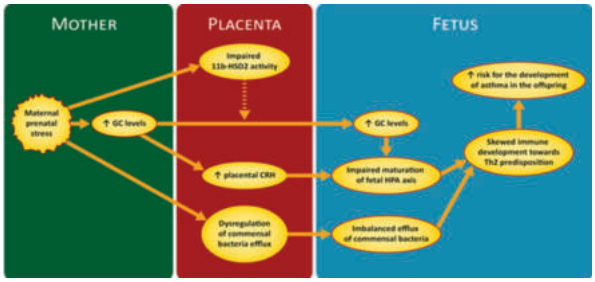

Figure 1

Uterine Artery Resistance is another phenomenon in which maternal psychological state might affect the foetus through the alteration in the blood flow to the foetus via uterine arteries. While HPA axis may be involved with increasing uterine artery resistance, it has been stated that noradrenaline is likely a mediator via sympathetic – adrenal activation.[14] The previous studies have shown a linear relationship between plasma noradrenaline concentration and anxiety.[15]

Maternal Stress and Epigenetics

Epigenetic mechanisms like DNAm, histone modifications and MicroRNAs are potential processes to observe the influence of prenatal stress on foetal development (Fig 1.A). These epigenetic signatures are greatly influenced by prenatal stress and inturn regulates the gene expression.

Studies on humans often focused on candidate genes involved in the HPA Axis. HPA Axis is a main regulator on stress responses and it has been observed that maternal stress during gestation can lead to longer term effects on HPA axis functions and stress related outcomes on the offspring.[16,17] One of the most studied HPA axis candidate gene is NR3C1 encoding the gluco corticoid receptor (GR) which is responsible for the negative feedback loop of the HPA axis.[18] These studies with the interest in DNAm of NR3C1 were initiated in the rats, where NR3C1 exon 1F methylation in the brain of the offsprings varied by maternal care and had relevance for GR expression.[19] In human blood samples of children, DNAm of the NR3C1 promoter was associated with the maternal prenatal experiences, like intimate partner violence and the exposition to the Tutsi genoside[20]. Another systematic review assessed the associations with the maternal prenatal stress which includes stressful life events, perception of stressors, resulting phenotypes of stressors etc and DNAm among commonly studied HPA axis candidate genes 11BSHD2, OXTR, SLC6A4, CRH, CRHBP, FKBP5 conducted among infants below the age of 1 year.[21] FKBP5 is involved in the termination of the stress response by regulating GR sensitivity.[22] 11BHSD2 is involved is known to be the placental gene encoding the enzyme that catalyzes the cortisol into cortisone and thus protects the foetus from excessive cortisol exposure.[23] CRH and CRHBP are responsible in the production and release of cortisol by the pituitary gland as a part of HPA axis functioning.[24] The serotonin receptor gene, SLC6A4 is implicated in the serotonergic modulation of the HPA axis[25] , and the oxytocin receptor gene OXTR is assumed to play a role of HPA axis inhibition.[26]

DISCUSSION

According to the classical Ayurvedic propositions, maternal behaviour and mental state during the gestation period exerts a profound and longstanding influence on foetal development, especially in shaping the early neurological outcomes. Garbhakala is not just a passive recipient of genetic instructions but sentient, responsive entity whose growth is modulated by the Ahara, Vihara, Aushadha and Manovyapara of the Garbhini.

The practice of Sadvritta during the Garbhakala likely plays a role in stabilizing maternal neuroendocrinal balance. The Ayurvedic emphasis on Sattva of a Garbhini is echoed by the modern findings that shows the maternal stress and cortisol levels significantly influence foetal brain development, especially areas like amygdala and hippocampus that regulate emotions, memory and other higher mental functions.

Aptavachanas like listening to Garbhopanishad mantras, recitation of positive affirmations etc reflects an early understanding of foetal sensory receptivity, now well established in foetal psychology.

CONCLUSION

Women mental health specifically during the gestation and postpartum are the major public health concern. As many as 15% of the childbearing women are likely to develop a new episode of major or minor depression in the interval between conception and the first three months post delivery.(Gavin et. al. 2005; Bennet et.al.2004, Rahman, Iqbal and Harrington 2003).

Stress during pregnancy increased risk for women and their fetus like spontaneous abortion, miscarriage, preterm birth, low birth weight baby and longer labor pain, postpartum amenorrhea etc. Currently there is no formal provision in the Indian health care system for dealing with psychological or stress related problems during pregnancy, it is hoped that identifying the problem and drawing attention to its prevalence will improve the awareness and sensitivity of public health care practitioners to this issue and the need to address it at the academic and the policy level to suggest some appropriate measures.

This article demonstrates that wisdom of Sattva in Garbhini aligns well with the current insights from the developmental biology and paediatric neuropsychology, thus offers an experiential, holistic and preventive model.

REFERENCES

1. Agnivesha, Charaka Samhita, Sharira sthana, 4/15 edited & translated by Prof Sharma PV. Chaukhambha Orientalia; 9th ed.2004.p.465
2. Agnivesha, Charaka Samhita, Sharira sthana, 4/15 edited & translated by Prof Sharma PV. Chaukhambha Orientalia; 9th ed.2004.p.431
3. Sushruta, Sushruta Samhita of Sushruta with Nibandha sangraha commentary of Shri Dalhanacharya, Sharira Sthana, 3/19-28. Acharya JT, editor of ayurvedia granthamala, Chaukhamba Surabharati Prakashana; 1st ed. Reprint 1994. P. 272-3
4. Agnivesha, Charaka Samhita, Sharira sthana, 4/15 edited & translated by Prof Sharma PV. Chaukhambha Orientalia; 9th ed.2004.p.465.
5. Glover V, O'Connor TG. Effects of antenatal stress and anxiety: Implications for development and psychiatry. Br J Psychiatry 2002; 180: 389-91
6. Hultman et. al. 1999, Teixeira et al. https://bjp.repsych.org/cgi/content/full/180/5/389
7. R. Cantwell, Mental disorder in pregnancy and the early postpartum, Anaesthesia 76(2021). 76-83.
8. K.L Wisner, D.K.Y Sit, M.C. Meshea, D.M. Rizzo, R.A. Zoretich, C.L. Hughes, et.al., onset timing, thoughts of self harm and diagnoses in post partum women with screen – positive depression findings, JAMA Psychiatry. 70(2013). 490-498
9. C.A. Marshall, J. Jomeen, C. Huang, C.R. Martin, The relationship between maternal personality disorder and early birth outcomes: a systematic review and meta analysis, Int. J. Environ. Res. Publ. Health 17(2020) 1-19.
10. K.L Wisner, D.K.Y Sit, B.H. Hanusa, E.L. Moses Kolko, D.L. Bogen, D.T. Hunker, et. al, Major depression and antidepressant treatment: impact on pregnancy and neonatal outcomes. Am. J. Psychiatry 166(2009) 557-566
11. Heinrich SM, Baumgartner T, Kirschbaum C, Ehlert U. Social support and oxytocin interact to supress cortisol and subjective responses to psychosocial stress. Biol psychiatry. 2003; 54(12): 1389-98. https://doi.org/10.1016/s0006-3223(03)00465-7
12. Kammerer M, Taylor A, Glover V. The HPA axis and perinatal depression: Hypothesis. Arch Women Mental Health. 2006 9(4): 187-196. [PubMed: 16708167]
13. Tsigos C, Chrousos G, Hypothalamic-pituitary-adrenal axis, neuroendocrine factors and stress. J Psychosom Res. 2002; 53(4): 865-871. [PubMed: 12377295]
14. Teixeira JMA, Fisk NM, Glover V. Association between maternal anxiety in pregnancy and increased uterine artery resistance index: Cohort based study. British Medical Journal. 1999; 318: 153-157. [PubMed: 9888905]
15. Starkman MN, et.al. Peripheral catecholamine levels and the symptoms of anxiety: studies in patients with and without pheochromocytoma. Psychosomatic Medicine. 1990; 52:129-142. [PubMed: 2330387]
16. Duthie L, Reynolds RM, Changes in the maternal hypothalamic- pituitary- adrenal axis in pregnancy and postpartum influences on maternal and foetal outcomes. Neuroendocrinology.2013, 98(2). 106-15. https://doi.org/10.1159/00354702
17. Mathews SG, McGowen PO, Developmental programming of the HPA axis and related behaviours. Epigenetic mechanisms. J. Endocrinol. 2019. 242(1): T69-79. https://doi.org/10.1530/JOE-19-0057
18. DeRijk RH, Schaaf M, de Kloet ER. Gluco corticoid receptor variants: clinical implications. J Steroid Biochem Mol Biol. 2002, 81(2): 103-22. https://doi.org/10.1016/80960-0760(02)00062-6
19. Weaver IC, Cervoni N, Champagne FA, D'Alessio AC, Sharma S, Seckl JR, Meany MJ. Epigenetic programming by maternal behaviour. Nat Neurosci. 2004, 7(8); 847-54. https://doi.org/10.1038/nn/276
20. Pernud N, Rutembusa E, Paoloni- Giacobimo A, Mutabaruka J, Mutesa L, Stenz L, Karege F. The tutsi genoside and transgenerational transmission of maternal stress: epigenetics and biology of the HPA axis: World J Biol Psychiatry. 2014; 15(4): 334-45. https://doi.org/10.3109/15622975.2013.86693
21. Sosnowski DW, Booth C, York TP, Amstadter AB, Kliewer W. Maternal prenatal stress and infant DNA methylation: a systematic review. Dev Psychobiol. 2018; 60(2): 127-39. https://doi.org/10.1012/dev.21604
22. Zannas AS, Binder EB. Gene environment interactions at the FKBP5 locus; sensitive periods, mechanism and pleiotropism. Genes Brain Behav. 2014; 13(1): 25-37. https://doi.org/10.1111/gbb.12104
23. Schoof E, Girstl M, Frobenius W, Kischbaum M, Repp R, Knerr L, Dotsch J. Course of placental 11 beta- hydroxysteroid dehydrogenase type 2 and 15- hydroxy prostaglandin

dehydrogenase Mrna expression during human gestation. Eur. J. Endocrinol. 2001; 145(2): 189-92. https://doi.org/10.1530/eje.0.1450187
24. Ketchesin KD, Stinnett GS, Seashottz AF. Corticotropin- releasing hormone binding protein and stress: from invertebrates to humans. Stress. 2017; 20/5: 449-64. https://doi.org/10.1080/10253890.2017.1322575
25. Porter RJ, Gallagher P, Watson S, Young A H. Corticosteroid- serotonin interactions in depression: a review of the human evidence. Psychopharmacology. 2004; 173(1-2): 1-17. https://doi.org/10.1007/s00213-004-1774-1
26. Heinrich SM, Baumgartner T, Kirschbaum C, Ehlert U. Social support and oxytocin interact to supress cortisol and subjective responses to psychosocial stress. Biol psychiatry. 2003; 54(12): 1389-98. https://doi.org/10.1016/s0006-3223(03)00465-7