



Review Article

THE ROLE OF *GARBHINI PARICHARYA* IN PREVENTION OF ADVERSE BIRTH OUTCOMES

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ABSTRACT

Garbhini Paricharya, or the care of a pregnant woman, is a vital aspect of Ayurvedic medicine that emphasizes the importance of holistic health during pregnancy. This traditional practice outlines guidelines for maternal care to ensure both the mother's and the child's well-being. The principles of *Garbhini Paricharya* highlight the interconnectedness of physical, mental, and emotional health, advocating for a nurturing environment during one of life's most transformative periods. Adverse birth outcomes refer to negative results of pregnancy and childbirth, which can include preterm birth, low birth weight, stillbirth, and neonatal complications. Thus, the current review is based on the role of *Garbhini Paricharya* in the prevention of adverse birth outcomes.

INTRODUCTION


Garbhini Paricharya, or the care of a pregnant woman, is a vital aspect of Ayurvedic medicine that emphasizes the importance of holistic health during pregnancy. This traditional practice outlines guidelines for maternal care to ensure both the mother's and the child's well-being. The principles of *Garbhini Paricharya* highlight the interconnectedness of physical, mental, and emotional health, advocating for a nurturing environment during one of life's most transformative periods. In Ayurveda, pregnancy is viewed not merely as a biological process but as a sacred journey. The term "*Garbhini*" refers to a pregnant woman, while "*Paricharya*" signifies care or treatment. According to Ayurvedic texts, a woman's health during pregnancy significantly influences the child's development, personality, and future well-being. Therefore, *Garbhini Paricharya* emphasizes a balanced lifestyle, appropriate nutrition, and mental wellness to foster optimal growth for both mother and child.

Shad Garbhakara Bhavas

To procreate a healthy progeny, 6 procreative factors like, *Matrija bhava*, *Pitrija bhava*, *Atmaja bhava*, *Rasaja bhava*, *Satmyaja bhava* and *Sattvaja bhava* have been given prior importance. The conglomeration of these factors is a mandatory requisite for a healthy progeny.^[1] Each *Garbhakara bhava* is assigned with a certain organogenesis, functional or psychological phenomenon in the offspring during its intra uterine life.^[2] A deviation or deprivation in these factors may lead to physical, functional or psychological defects.

Adverse Birth Outcomes

Adverse birth outcomes particularly preterm births and congenital anomalies are the leading causes for infant mortality in the global level, among which the burden is highest in developing countries. Globally, out of all live births, 27% are small for gestational age (SGA), 1.3% are stillbirths, 10.6% are of preterm and 2.2% of newborns have structural anomalies.^[3-6] Stillbirths and miscarriages have a significant negative impact on the affected families and the children who are born prematurely have higher rates of sensory deficits, respiratory illnesses and experience delay in developmental milestones as well as learning disabilities.

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The aetiologies of adverse birth outcomes are multifactorial and vary across different circumstances. Studies have shown that specific socio-demographic factors, obstetric factors, comorbidities and maternal clinical conditions, including nutritional status and health service utilizations are predictors for adverse birth outcomes. According to a cohort study conducted among 1916 women, 3.4% had still births, 1.8% were miscarriages, 1.2% had congenital anomalies, 11.8% were small for gestational age and 8.4% were preterm.^[7]

Risk Factors for Birth Defects

Overall, 2% to 4% of live births are reported to involve congenital abnormalities where it may be syndromic, involving multiple organ systems or can be isolated.^[8] The risk factors that is being associated with birth defects can be categorized as modifiable and non-modifiable. The modifiable risk factors require patient education or counselling regarding diet and lifestyle modification. The prominent risk factors like age, family history and previously affected child are usually considered as non-modifiable. Looking upon various studies related with risk factors of birth defects, there is a strong link between alcohol use, folic acid deficiency, obesity, uncontrolled maternal diabetes mellitus, uncontrolled maternal phenylketonuria, monozygotic twins and an increased risk of congenital anomalies.^[9] Advanced maternal age also has a crucial association with non-chromosomal abnormalities. Some medications such as angiotensin converting enzyme inhibitors, retinoic acid, folic acid antagonists, certain anticonvulsants are associated with various birth defects.^[10]

Maternal and Foetal Genetic Contribution in Birth Outcomes

Various epidemiological studies have demonstrated that maternal physical and physiological traits are in close association with birth outcomes, like association between higher maternal blood glucose and higher birth weight,^[11] association between maternal blood pressure and reduced birth weight.^[12,13] These birth outcomes can later act as causative factors for long term adverse health outcomes in the offspring like obesity, type II diabetes, hypertension and cardiac diseases. According to a Mendelian Randomization Study, on maternal phenotypes and birth outcomes conducted among 10,734 mother infant pairs with genotype and phenotype data, it was observed that maternal height was positively associated with longer gestational duration, lower preterm risk and higher birth weight. Maternal BMI was positively associated

with birth weight and birth length.^[14] Maternal BP during gestation was negatively associated with gestation duration and birth weight.

Immunogenetics

Various environmental and socioeconomic factors contribute to these outcomes, emerging research highlights the critical role of immunogenetics- the intersection of immunology and genetics. Understanding how genetic variations influence immune responses can illuminate pathways leading to adverse birth outcomes, offering potential for targeted interventions and improved health strategies. Immunogenetics deals with the genetic basis of the immunological phenomenon for the survival and to combat the antigenic challenge faced by an individual. The immune system comprises of two components:

1. Cellular immunity: Conferred by T-cells, these are thymus dependent cells.
2. Humoral immunity: Conferred by formation of antibody produced by B-cells, these are bursa dependent cells.

Pregnancy is a unique immunological state characterized by a delicate balance between maternal immune tolerance and the need to protect against pathogens. The maternal immune system adapts to accommodate the semi-allogeneic foetus, which can lead to altered immune responses. Dysregulation in these immune mechanisms can contribute to complications, including pregnancy loss and adverse birth outcomes.

Genetic Variability and Immune Response

Immunogenetics focuses on how genetic variations- specifically polymorphisms in immune-related genes-affect immune responses. For instance, single nucleotide polymorphisms (SNPs) in cytokine genes can influence the production of pro-inflammatory and anti-inflammatory cytokines. An imbalance in these cytokines can lead to conditions such as gestational diabetes, preeclampsia, and intrauterine inflammation, all associated with adverse birth outcomes.^[15]

Maternal Epigenetics

Epigenetic inheritance can be explained as heritable changes in gene expression or cellular phenotypes that occur without altering the DNA sequence. These gene expression influencing mechanisms governs changes including DNA methylation, which impacts the cystocine guanine dinucleotide motifs, as well as post-translational modifications of the amino-terminal tails of histones. The common post translational modifications are methylation, acetylation,

deamination, phosphorylation and ubiquitination. Recently sumoylation, ADP-ribosylation and proline isomerization have been added as post translational modifications.

According to various studies related to maternal epigenetics, maternal lifestyle and prenatal factors are associated with health consequences and diseases later in life.^[16] This period is characterized by physiological alterations affecting processes including immune system and the metabolism of glucose and fats. Foetal tissue and organs during pre-conception, fertilization, gestation and first year of newborn life are susceptible to environmental and lifestyle factors that protect the child from disease susceptibility. Various studies have offered insight regarding the impact of early life stress during developmental stages on adverse birth outcomes.^[16] These environmental and lifestyle factors modulate cellular function and gene expression through mechanisms including DNA methylation and histone modification. These epigenetic mechanisms have prominent role in birth outcomes as they act as central regulators of systemic physiological and biological processes, diseases, placental developmental and its function.

Maternal Stress

Studies have stated about the resultant changes in DNA methylation caused by the effect of prenatal stress on offspring. Babenko et al., hypothesized that prenatal stress has epigenetically regulated effects on health and diseases of the nervous system from early development to the old age of the individual.^[16] In placenta affected by preeclampsia, increased DNA methylation has been observed at CpG residues associated with the genes encoding glucocorticoid receptor and corticotropin releasing hormone binding protein, compared with normal placental tissues.

Embryo Development

DNA methylation and histone modification, play a predominant role in embryonic and foetal development, including the determination and maintenance of cells and regulation of genome imprinting. Some evidence has explained that premature birth and reduced birth weight is caused by maternal stress during gestational period. The hypothalamic-pituitary-adrenal axis is the chief mechanism that secretes steroid hormones, connecting maternal stress to foetal development and birth outcome. Cortisol is considered as a mediator in linking the maternal stress during gestation birth outcomes. According to the study of Obel et al 2005, established that pregnant women

who experienced high levels of perceived gestational stress had lower morning cortisol levels at 14 gestational weeks and higher levels at 30 gestational weeks.^[17]

DISCUSSION

- 1. Matrija Bhavas:** *Kula* or *Gotra* of parents, maternal age at the time of conception, female reproductive health, quality of *Bija* of mother, *Matrija ahara* during pregnancy and any diseases during the *Garbhakala* can affect the health of the offspring. Certain maternal diseases are directly correlated to the congenital abnormalities of the foetus like, if a pregnant woman is affected by rubella during the time of organogenesis, the foetus may have CRS triad PDA, blindness or sensorineural deafness. Diseases that occur due to mutation in the mitochondrial genome are inherited only from the mother, as only the ovum contains mitochondrial genetic material.
- 2. Pitrija Bhavas:** If a *Bija* from male is afflicted, a progeny may have congenital abnormalities. Abnormalities of *Shukra* and *Vayu* are believed to produce congenital anomalies in the offspring. *Acharya Bhavamishra* stated the abnormality of *Shukra* as a cause of congenital blindness.^[18] Advanced paternal age increases the risk of dominant mutations like, Achondroplasia, Apher's syndrome, Myositis ossificans and Marfan syndrome.^[19]
- 3. Atmaja Bhavas:** According to Indian scriptures, the soul undergoes a series of births depending on the good or bad deeds. The effect of these actions of previous births may be carried onto the successive birth. The results of these actions get transferred to the *Garbha* during the union of *Shukra* and *Artava*. *Lingashareera* is the carrier of these deeds. In the modern concept, we can consider the law of probability, i.e., autosomal dominant trait running in the family and only one partner is affected. 50% of the offsprings are expected to be affected, while the remaining 50% may escape unaffected. Though traits have been passed onto all the offsprings, the result of being affected by the trait differs from individual to individual.
- 4. Satmyaja Bhavas:** Ayurveda believes in the importance of *Kala* especially during the union of *Bija* for the formation of progeny. Thus, due consideration is given to proper time of *Garbhadhana Samskara* for achieving a healthy progeny.

5. Rasaja Bhavas: Here *Rasa* refers to *Ahara rasa*. The *Ahara rasa* consumed by the *Garbhini* helps in the formation of *Saptadhatus* in the *Garbha*. Thus, *Acharyas* have mentioned regarding *Masanumasika Garbhini Pathya*, which are specific month wise dietetic regimens for a pregnant woman. The diet and regimen followed by the pregnant women shows a great influence over the foetus. There have been studies stating that daily consumption of alcohol may result in Foetal Alcohol Syndrome.

6. Sattvaja Bhavas: The *Sattva* of the foetus is developed by:

Sattva of Parents – Genetic derivatives

Garbhini Uparjita Karma – Gestation derivatives

Janmantara Vishesh Abhyasa – Environmental derivatives

Among these 3 factors, the dominant one affects the psychology of the foetus.^[20] Though it is said that presence of psychic factors are there since pre-embryonic life and gets associated in the process of fertilization, its psychic tendencies of foetus can be observed from the development of *Indriyas*. By the emergence of *Indriyas*, the *Manas* of foetus can feel *Vedana* and desires for the things in the previous life, which is known to be *Douhridya*. The *Dauhridha Avastha* of *Garbhini* is an evident manifestation of *Sattvaja Bhava*.

CONCLUSION

Garbhini Paricharya represents a holistic approach to pregnancy, intertwining physical health, emotional well-being, and spiritual growth. By following these principles, pregnant women can cultivate a nurturing environment that supports the development of their children. As we integrate these timeless Ayurvedic practices into modern maternal care, we can honour the wisdom of traditional medicine while promoting healthier pregnancies and families. Ultimately, *Garbhini Paricharya* underscores the profound impact of maternal health on future generations, making it an essential aspect of both Ayurveda and contemporary healthcare.

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