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LONG-TERM EFFECTS OF EXCESSIVE *MADHURA RASA* (SUGAR) CONSUMPTION DURING PREGNANCY ON FETAL HEALTH: AYURVEDA AND MODERN INSIGHTS

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ABSTRACT

Diet plays a pivotal role in maintaining overall well-being. Specifically, the food choices made by pregnant women significantly affect both maternal and fetal health and can have long-term impacts on the child's health. In Ayurveda, Ahara (diet) is one of the Trayopasthamba and is considered of utmost importance during pregnancy. Both Garbhini Ahara (maternal diet) and Vihara (lifestyle) are highly emphasized in Ayurveda, along with the adverse effects of improper dietary and lifestyle choices. One such dietary factor is the excessive consumption of Madhura Rasa (sweet taste), which can lead to disorders like Prameha, Sthoulya, and Mukata in the offspring. In modern times, excessive maternal sugar intake during pregnancy is a major concern, as several scientific studies indicate a correlation between maternal sugar consumption and increased risks of obesity, diabetes, and cognitive impairments in children. This article explores the long-term impact of excessive consumption of sugar during pregnancy on fetal health through Ayurveda and contemporary scientific perspectives.

KEYWORDS: *Ayurveda*, Pregnancy, Diet, *Madhura Rasa, Shtoulya, Prameha*

INTRODUCTION

Ahara, *Nidra*, and *Bhramacharya* are considered as *Trayopasthamba*, the three pillars of health.[1] The balanced state of *Doshas*, along with proper *Upastambana* (supports), fosters *Swasthya* (health). Disruptions in these factors lead to various disorders. Among the *Trayopasthamba*, *Ahara* plays a major role, as inappropriate consumption of food can lead to numerous diseases. According to a recent ICMR study, there has been a significant rise in metabolic and non-communicable diseases, especially in India, with an alarming increase in diabetes and metabolic disorders.[2] The rise in childhood obesity and diabetes in adults is also a growing global concern.

REVIEW

Food sustains life, and its significance cannot be overstated. In Ayurveda, *Ahara* is one of the *Trayopasthamba* and is essential for maintaining health. *Yuktiyuta Ahara* (appropriate diet) consumption provides several benefits, including *Varna* (complexion), *Prasada* (clarity), *Souswarya* (clarity in voice), *Jeevitha* (longevity), *Sukha* (happiness), *Pushti* (nourishment), *Bala* (strength), and *Medha* (intellect).[3]

The classics of Ayurveda describe the six tastes (*Shadrasa*): *Madhura* (sweet), *Amla* (sour), *Lavana* (salty), *Katu* (pungent), *Tikta* (bitter), and *Kashaya* (astringent).[4] *Madhura Rasa* is primarily composed of the *Jala Mahabhuta* (water element) and is considered as *Aajanma Satmya* when consumed in moderate quantities.[5] Madhura Rasa offers benefits like *Preenana* (nourishment), *Tarpana* (satisfaction), *Bhrimhana* (nourishment), and *Sthiryakara* (stability).[6] However, excessive consumption of Madhura Rasa can lead to disorders such as *Sthoulya* (obesity), *Alasya* (laziness), *Anidra* (insomnia), *Anannabhilasha* (loss of interest to food), *Kasa* (cough), *Shwasa* (shortness of breath), and *Meha* (diabetes).[7]

During pregnancy, the fetus depends entirely on the maternal diet for nourishment and development. The food consumed by a pregnant woman serves three primary purposes:[8]

1. ***Swa Shareera Pushti*** – The nourishment of the mother's body.
2. ***Garbhavridhi*** – The nourishment of the fetus for its development.
3. ***Sthanya Vridhi*** – The nourishment for breast development.

DISCUSSION

An unhealthy diet, particularly the consumption of excess *Madhura Rasa*, can lead to significant health concerns. The food choices an individual make is usually, influenced by taste preferences such as sweet, sour, or spicy, however taste of a food apart from sensory perception can also have a profound impact on both maternal and fetal health. Ayurveda emphasizes that *Rasa (*taste*)* is a crucial component of food we consume, especially in pregnancy, as fetal development is entirely dependent on the maternal food intake.

The fetus, being highly delicate and is highly vulnerable to the influences of maternal dietary and lifestyle choices. Ayurveda identifies certain factors as *Garbhopaghatakara Bhavas* that is the factors that may harm the fetus and excessive *Madhura Rasa* consumption is one such factor that can lead to *Janmabala Pravritta Vyadhi* - disorders in the offspring due to unwholesome diet and lifestyle of mother.[9] When a pregnant woman consumes an excessive amount of *Madhura Rasa*, the

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Anna Rasa (digestive essence) formed from digestion in turn becomes predominantly *Madhura*. This *Anna Rasa* which is *Madhura Rasa Pradhana* enters the *Rasavaha Nadi* and reaches the fetus through the *Garbha Nadi*, leads to *Shleshma Vridhi* in *Garbha* resulting in disorders such as *Sthoulya* (obesity), *Prameha* (diabetes), and *Mukata* (speech disorders).[10]

Unhealthy dietary patterns, especially the overconsumption of processed foods high in simple sugars and sweeteners, significantly affect pregnancy outcomes and the long-term health of the child. Hyperglycemia during pregnancy has well-documented adverse effects on the offspring as it is considered as prenatal exposure to second-hand sugar, the impact is either short term or long term. Excessive sugar intake during pregnancy contributes to excessive weight gain, increasing the risk of conditions like gestational diabetes mellitus (GDM), pre-eclampsia, and preterm birth.[11] For the offspring, immediate effects may include being large for gestational age and hypoglycemia in the postpartum period. Long-term effects may include an increased risk of obesity, insulin resistance, and impaired neurocognitive development.[12]

A study conducted with 906 mother and child pair showed maternal glycemic index at 11th week of pregnancy were positively associated with child fat mass at age of 4 and 6 years.[13] Another conducted with 918 mother and child pair found mothers who consumed artificial sweetened beverages compared with those who have not consumed were more likely to have children who are large for gestation at birth and were overweight or obese by 7 years of age.[14]

While many studies strongly suggest a link between maternal hyperglycemia and the increased risk of childhood obesity and diabetes, the mechanisms behind these outcomes remain unclear. One hypothesis, the *Fetal Over-nutrition Hypothesis*, suggests that increased exposure of the fetus to nutrients and elevated glucose levels may lead to structural and functional adaptations in adipose tissue, appetite regulation, and energy metabolism. This could result in epigenetic modifications and the differential development of organs, leading to an increased risk of obesity, impaired metabolic health, and lower cognitive ability in later life.[15]

CONCLUSION

Both Ayurvedic texts and contemporary studies highlight the importance of diet in maintaining health, particularly during pregnancy. Excessive sugar consumption during pregnancy is associated with various immediate and long-term health concerns for the offspring. Therefore, a simple and effective measure is to prioritise a healthier prenatal diet as it is crucial for promoting the well-being of both mother and child. As Ayurveda states, *Nidana Parivarjana Meva Chikitsa* (avoiding the causative factors is the first line of treatment), and thus, avoiding excessive Madhura Rasa intake could be the first step toward ensuring a healthier future for the child.

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