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Iron prophylaxis in Pregnancy - Modern and Ayurvedic View

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ABSTRACT

Iron is mandatory for normal fetal development, including the brain. Iron deficiency may have deleterious effects for intelligence and behavioral development. It is important to prevent iron deficiency in the fetus by preventing iron deficiency in the pregnant woman. Iron deficiency anemia during pregnancy is a risk factor for preterm delivery and low birth weight. *Ayurveda* has recorded some of the complications of pregnancy under the name *Garbhopdravas*. *Garbhini Pandu* is the commonest *Upadrava* among them. *Garbhini Pandu* is described as a symptom and not as a *Vyadhi* in *Ayurveda* classics.

Key words: *Garbhini Pandu, Gestational anaemia, Ayurveda.*

INTRODUCTION

In a global perspective, the most frequent nutritional insufficiency is definitely iron deficiency, which is encountered with a high prevalence in women of fertile age as well as in pregnant and postpartum women.[1] In many developing countries, iron deficiency anemia (IDA) in pregnancy is more the rule than the exception with a prevalence of approximately 52%.[2] In the prosperous western societies, the frequency of IDA is lower due to better nutrition, approximately 25% in pregnant women not taking iron supplements and less than 5% in women taking prophylactic iron supplements of 40-60 mg ferrous iron per day.[3,4] Regarding the prevention and the treatment of severe anaemia, the World Health Organization has reported that a more rapid erythropoietic response is observed and complete correction of iron deficiency with parenteral iron therapy compared to oral iron administration.[5] Consumption of high levels of iron on empty stomach have been shown to cause gastrointestinal distress in women.[6] Whereas, intravenous or intramuscular iron supplementation is said to be connected with anaphylactic shock and allergic reactions; it is also observed that venous thrombosis, cardiac arrest and death are predisposed by parenteral iron therapy.[7,8] Hence, there is a need for the effective management of Gestational anaemia that affects the pregnant others in the delivering a normal healthy baby.

India is brimming with a rich heritage of traditional system of medicine. Among various systems of medicines that are followed, *Ayurveda* is one such traditional Indian system of medicine that focusses on prevention and curing the diseases. *Ayurveda* encompasses a scientific tradition of management of diseases based on *Aptopadesha* and its traces of origin can be found in *Rigveda* and *Atharvaveda*. *Ayurveda* more than a medical science, is a life science that has surplus of knowledge on the maintenance of health,

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therapeutic drugs, treatment of various diseases and ethnic folklore practices.[9] *Ayurveda*, an ancient science that is 5000yrs old and practiced even today because of its authenticity has given more importance of women and thereby has a vast elucidation of women health, pregnancy, labour and their disorders with the management. In this study, an attempt has been made to evaluate the concept of Gestational Anemia which is called *Garbhini Pandu* in *Ayurveda* in detail.

Discussion

Individual Iron Prophylaxis

The serum ferritin concentration should be analyzed when pregnancy is planned or as early in pregnancy as possible, preferably within 10 weeks gestation. Each µg/L of ferritin indicates approximate mobilizable body iron reserves of 7-7.5 mg. Multivitamin-multimineral tablets (preferably without iron) containing 0.4 mg folic acid should be recommended from the time pregnancy is planned.

1) Ferritin above 70–80 µg/L (~20–25% of pregnant Danish women): body iron reserves are larger than 500 mg and iron supplements are not indicated. If ferritin is above 100–150 µg/L, consider to check for inflammation, kidney disease, liver disease, hereditary hemochromatosis, cancer.
2) Ferritin in the range of 30–70 µg/L (~40% of women): iron reserves are 200–500 mg. Advocated iron supplements are 30–40 mg ferrous iron daily.
3) Ferritin below 30 µg/L (~40% of women): iron reserves are small and depleted in those women having values below 15 µg/L: advocated iron supplements are 60–80 mg ferrous iron daily.

Individual iron prophylaxis has since 2002 been advocated by the Danish National Food Institute and since 2005 by the Danish Council of Nutrition. Both institutions conclude that iron supplements should be restricted to women with a clear demand for extra iron. However, the Danish National Board of Health, having the final decisive authority, still needs to approve these recommendations. In Sweden, individual iron prophylaxis has been recommended by the Swedish Society for Obstetrics and Gynaecology since 2008.

Aetiology and Pathogenesis (*Nidana* and *Samprapti*)

In developing countries, the causes of anemia are multifold including deficiencies of iron, folate, and vitamins A and B12 etc. micronutrient deficiencies, anaemia due to malaria and hookworm etc parasitic infections, anemia due to chronic infections like TB and HIV. Etiology may also vary based on the dietary practices, seasonal variations and geographical location too. During the pregnancy, the overall iron requirement is significantly higher in the woman's life despite the losses incurred during menstruation. In pregnancy, there is greater production of red blood cells; increase in the iron needs to expand the plasma volume to compensate the iron loss at delivery and for the support and growth of fetal-placental unit. In a pregnant woman with average weight of 55kg, the physiological iron demand roughly corresponds to 1000-1200mg, about 500mg associated with expansion in red cell mass, 350mg associated with fetal and placental growth and around 250mg associated with blood loss at delivery. In the process of gestation, requirement of iron varies in different trimesters with lower iron necessity in the first trimester (0.8mg/day) and a much higher need in the third trimester (3.0-7.5mg/day). Iron deficiency anaemia if undiagnosed and untreated can affect both the maternal and fetal health to greater extent. Chronic iron deficiency being very dangerous leads to fatigue reduced working capacity and disturbs the quality of life. In addition, palpitations, headaches, dizziness, pallor, breathlessness and irritability are also seen. Evidences show a significant correlation between the premature birth and low birth weight, intrauterine growth restriction, low neonatal iron status, preeclampsia, and post-partum hemorrhage and the severity of anemia. In the current situation, women are playing a multi-tasking role and therefore unable to follow proper diet and lifestyle practices during pregnancy. These *Apathyakara Aaharavihara*, leads to vitiation of *Rasa Dhatu* and causes *Uttarottaara Dhatunirmiti Hani* or *Vikrut Dhatu Utpatti* and manifestation of *Garbhini Pandu*. For pregnant women, Ayurvedic way of life will be very good and plays a significant role in the birth of a healthy progeny. Woman is said as the center of

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Suprajanirmiti due to the dependency of fetus on the mother for nutrition. According to *Acharya Haritha*, *Garbhini Pandu* is one among the *Ashtagarbhopadravas* and the most common disease occurring in pregnancy which means the diseases caused by fetus in pregnant women. Ayurvedic science enlists the causes of such disease as consumption of excessive *Amla* (sour) *Lavana* (salty) and *Katu* (pungent) *Rasa* (taste) *Aahara*, indulging in *Diwaswapa* (day time sleep), *Vishamashana* (improper dietary habits), *Vegavidharana*, (suppression of urges) and afflicted with *Manasika Bhava* (psychological effects). This in turn leads to the vitiation of *Rasavaha* and *Raktavaha Srotas* and to *Pandutva* in *Garbhini*.

Clinical Presentation (*Roopa*)

During pregnancy, it is very crucial to screen for anemia as it is one of the commonest problems faced in the developing countries. Guidelines recommend that the anemia screening should be initiated in the first trimester, second at 24–28 weeks and third at 36th week of gestation. While defining the physiologic anemia of pregnancy, in addition to the haemoglobin values given by World Health Organization and Centre of Disease Prevention for anemia in pregnant women, pallor with peripheral smear showing normal morphology of RBC is taken as criteria and any deviation from this is considered as pathologic. Biochemically iron deficiency anemia is characterized by hypochromia where the mean corpuscular hemoglobin is less than 27 pg and microcytosis where mean corpuscular volume is less than 80 fl. Established bio-markers of iron deficient anemia or the erythropoiesis includes the reticulocyte hemoglobin content, percentage hypochromic reticulocytes and percentage circulating microcytes that are measured using modern automated analyzers. *Ayurveda* does not speak about *Garbhini Pandu* separately. After reviewing the literature in detail, the theories and the *Nidanapanchaka* in correlation with *Garbhini*, *Samprapti* of *Garbhini Pandu* involves the dominance of *Pitta* Dosha and that increases the *Dravabhava* of *Rasa Dhatu*. This *Rasadushti* leads to *Uttarottara Dhatunirmiti* and finally the manifestation of *Dhatushaithilya* and *Vaivarnya*. *Pandu* is also described as disease related to *Rasavaha* and *Raktavaha Srotasas*. In *Pandu Roga, Panduta* is the main feature which means paleness or the pallor of skin which occurs as a result of qualitative and quantitative deficiency of *Rasadhatu* and *Raktadhatus*. It presents with pallor of tongue, lip, skin, sclera and nails. Fetal requirements increase as pregnancy progresses based on its developmental milestones and hence makes the *Rasa Dhatu* of the *Garbhini* works additionally to fulfill the demands of *Garbha*. *Garbhini* needs to consume healthy food and also the quantity should be increased, but due to unavailability, she lands up in *Pandu*. Management of Gestational Anemia (*Chikitsa* of *Garbhini Pandu*), evaluation of the cause and the severity of anemia is required for the successful management of anemia during pregnancy. Some of the factors such as the severity of anemia, additional risks, maternal comorbidity, and time remaining until delivery are essential for the right therapeutic approach. The current management of anemia includes the oral and parenteral routes through which iron is supplemented and parenteral iron therapy is given intravenous from the second trimester. In addition to the supplementation, diet and nutrition plays an important role and this should be properly communicated to all pregnant women for preventing anemia in pregnancy.

According to CDC, a 30 mg per day iron supplement should be started at the first prenatal visit. Though recommendations varies based on the regions. British guidelines do not recommend any routine iron supplementation in pregnancy, whereas WHO advises 30-60 mg of elemental iron per day for all pregnant women. WHO also states that, when daily iron intake is not possible due to gastrointestinal side effects, weekly intermittent oral iron supplementation can be implemented. According to the association of Nutrition, the (RDA) of iron for a pregnant woman in third trimester is 30 mg/day. For all the pregnant women who are native to the areas of prevalence of hookworm/Trichuris, WHO recommends routine deworming using single dose Albendazole (400 mg) or mebendazole (500mg). In *Ayurvedic* science, *Garbhini Pandu* or the gestational anemia is treated effectively.

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Conclusion

One prevalent health problem that affects many pregnant women in underdeveloped nations is gestational anaemia, which calls for quick treatment to preserve the lives of both the mother and the unborn child. An ancient Indian science called *Ayurveda* offers extensive descriptions of pregnancy, labour, and the management issues that arise, placing a greater emphasis on women and their health. *Ayurvedic* science's description of *Garbhini Pandu* is associated with gestational anaemia. The ancient experts have successfully treated *Garbhini Pandu* since ancient times, and they are still treating them today. The current investigation has concentrated on defining the notions of *Garbhini*, its treatment, and its relationship to gestational anaemia in contemporary medicine.

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