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GARBHINI PANDU (IRON DEFICIENCY ANAEMIA IN PREGNANCY)

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ABSTRACT

Pregnancy in every woman's life is a joyful experience but from the nutritional perspective, it is no less than a challenge because nutrient requirements are increased and alter its intake can affect maternal and foetal health. In this process she experiences certain problems, one of them is anaemia. Globally iron deficiency has been claimed to be predominant cause of anaemia in pregnant women in which red blood cell count is less than the normal. According to WHO Hb percentage less than 11gm percent was consider as anaemia. About 50% of pregnant women worldwide suffer from anaemia and about 20% of maternal deaths in developing countries due to anaemia. In *Ayurveda*, anaemia in pregnancy can be termed as *Garbhini Pandu*. There is no direct reference of *Garbhini Pandu* in Ayurveda. But as per *Harita Samhita*, there is description of 8 *Garbhopdrava*, in which *Vivarnata* can be correlated with *Garbhini Pandu. Garbhavsthajanya Pandu* needs to be treated like *Samanya Pandu Chikitsa.*

KYEWORDS: *Garbhini Pandu, Garbhopdrava,* anaemia.

INTRODUCTION

Anaemia during pregnancy is highly prevalent in many developing countries like India and most of the South East Asian countries and affects both the mother's and her child's health. About 16-40% deaths occur due to anaemia. Anaemia also increase maternal morbidity and mortality. Mostly it is nutritional of which iron deficiency anaemia is predominant. According to standard laid down by WHO, anaemia in pregnancy is present when the

haemoglobin concentration in the peripheral blood is 11gm/100ml or less and haemocrit of less than 0.33gm/dl.[1]

Pandu is a disease characterised by the pallor of body which strikingly resembles with Anaemia of modern science. In *Ayurveda, Garbhini Pandu* is not a separate *Vyadhi* but considering the references from various *Ayurvedic* classics, the concept of *Garbhini Pandu* can be illustrated.

Prevalence of anaemia during pregnancy

Anaemia during pregnancy is a major public health problem throughout the world, particularly in developing countries. According to WHO prevalence of anemia in pregnant women is estimated at about 14% in developed and 51% in developing countries. In India, is 65-75%, when compared to other developing countries prevalence of anemia in all age groups is higher in India.[2] In south Asian countries India alone contributes 38-89% of maternal death due to anaemia.[3]

Iron deficiency anaemia

Anaemia in pregnancy is defined as a haemoglobin concentration of less than 110gm/l (less than 11gm/dl) in venous blood. It affects more than 16 million women globally, two-third of them being from Asia.[4] The centre for disease control and prevention (1990) defined anaemia as less than 11gm/dl in first trimester and third trimester, and less than 10.5gm/dl in the second trimester. The modest fall in haemoglobin levels during pregnancy is caused by the relatively greater expansion of plasma volume compared with the increase in RBCs volume.[4] The disproportion between the rates at which plasma and erythrocytes are added to the maternal circulation is greatest during the second trimester.

WHO classification of severity of anaemia in adult females[5]

	mild	Moderate	Severe
Non- pregnant women (above 15 yrs)	11-11.9g/dl	8-10.9 g/dl	Less than 8 g/dl
Pregnant women	10-10.9g/dl	7-9.9 g/dl	Less than 7g/dl

Globally, the commonest cause of anaemia in pregnancy is iron deficiency anaemia. According to NFHS-5 (2019-2020) by Union Ministry, as many as 66.4% women surveyed suffered from anaemia. India ranks 170 out of 180 countries for anaemia among women, according to global nutrition survey 2016. WHO has estimated, the prevalence of anaemia in pregnant women is about 14% in developed and 51% in developing countries. In India the

prevalence is 65-75% when compared other developing countries prevalence of anaemia in all age groups is higher in India.[2]

The prevalence of occult iron deficiency in the absence of anaemia is estimated to be between30 and 60% in pregnant women.[6]

Consequences of Iron Deficiency Anaemia in pregnancy

It is estimated that maternal anaemia contributes to 18% of perinatal mortality and 20% of maternal mortality in South Asian countries including India. According to CHERG, the risk of maternal mortality significantly decreases for every 1gm/dl rise in Hb, however, the association becomes less clear at haemoglobin levels above 8-9g/dl.[7] with respect to neonatal birth weight, both haemoglobin level more than 11g/dl and less than 9g/dl are associated with 2-3times increased risk of small for gestational age neonates. The ideal haemoglobin values with respect to prevention of prematurity and low birth weight lies between 9 to 11.5g/dl.[8]

Iron Metabolism

Iron is a critical element in the function of all cells, although the amount of iron required by individual tissues varies during development. At the same time, the body must protect itself from the free iron (highly toxic that participates in chemical reactions which generates free radicals i.e.; singlet- O2 /OH-). The major role of iron in mammals is to carry oxygen as a part of the heme protein, is a part of haemoglobin. Oxygen is also bound by a heme protein in muscles, myoglobin. Iron is a critical element in iron-containing enzymes, including the cytochrome system in mitochondria, without iron cells lose their capacity for electron transport and energy metabolism, in erythroid cells haemoglobin synthesis is impaired resulting in anaemia and reduced oxygen delivery to tissues.[9]

Physiology of Iron Balance during Pregnancy

Pregnancy costs an approx. 630mg of extra iron to the mother. In the hierarchy of iron usage the foetus takes the priority, followed by maternal haematocrit while the maternal iron stores are poor last and are often depleted during the course of pregnancy. The mother indeed requires iron stores for lactation and future pregnancies. To prevent the negative iron balance during pregnancy a mother requires at least 300mg of iron stores at the time of start of pregnancy if she consumes a diet rich in bioavailable iron and would require obligatory supplementation If she consumes a sub-optimal diet.[10]

Mostly the iron transfer to the foetus occurs during the second and trimester. The average daily requirement of iron has been calculated as 0.8mg/day in the first trimester and increases to 7.5mg/day in the third trimester. The average daily absorption from an Indian diet varies from 0.8mg/day to 4.5mg/day depending on the type of staple used.[11]

Diagnosing Iron Deficiency Anaemia in Pregnancy

Most guidelines recommend screening for anaemia during pregnancy in the first trimester followed by 24-28 weeks and at 36 weeks of gestation. The cut off values defined by WHO/CDC for anaemia in pregnancy along with peripheral smear showing normal morphology of RBC with central pallor have often been taken criteria for defining the physiologic anaemia and a deviation from these parameters often be treated as pathological anaemia.[12] In spite of known to be less sensitive than laboratory assessment, a history for fatigue, alopecia, pica restless leg syndrome, pagophagia, a brief examination for pallor, koilonychias, atrophic tongue papillae, glossitis and stomatitis should be undertaken for all pregnant women.[13]

Preventing Iron Deficiency Anaemia in Pregnancy

To all pregnant women effective communication about diet and nutrition is an integral part of preventing anaemia in pregnancy. However, as the extra demand of iron is often unmet by routine diet, regular iron supplementation is recommended. The CDC recommends that all pregnant women begin a 30mg/day iron supplement at the first prenatal visit.[14] WHO suggests 30-60mg per day of elemental iron for all pregnant women. In population with an anaemia prevalence among pregnant women of less than 20%, intermittent oral iron and folic acid with 120mg of elemental iron and 2.8mg folic acid once weekly for pregnant women to improve maternal and neonatal outcomes.[15] The equivalent of 60mg of elemental iron is 300mg ferrous sulphate heptahydrate, 180mg ferrous fumarate, 500mg of ferrous gluconate.[16] National iron plus initiative recommends iron folic acid supplementation of 100mg elemental iron and 500 mcg of folic acid every day for at least 100days starting after the first trimester at 14-16 weeks of gestation for all non-anaemic pregnant women followed by the same dose for 200days postpartum.[17]

Concept of *Garbhini Pandu*

The word *Pandu* derived from *Dhatu "Padi-Nashne"* with *"Ku" Pratayaya.* The meaning of root *Dhatu* is to destroy. "*Pandustu Peetbhagaardha Ketakidhulisannibha". Pandu* denotes colour that means to destroy the natural colour of skin.

In Ayurveda, there is not direct description of *Garbhini pandu* i.e; anaemia in pregnancy. In *Charak samhinta, Pandu roga* is a disease of *Rasavaha srotas*. In *Harita samhita, Acharya Harita*, has described *astha garbhopdrava* including *Vivarnatva* which comes across as pallor that goes along with anaemia.[18] In *Charak samhita, Acharya Caharak described that ahar rasa* intake by mother is divided into three parts, one for fetal nourishment another for *stanya nirmana* and one for herself. The growing fetus nourished by Aahar rasa of mother, so that the pregnant mother needs a better and more nutritious diet. *Acharya Harita* has described eight *Garbhopdravas in Harita Samhita* and included *Vivarntva* which appears to be pallor that accompanies anaemia.[19] *Charak* stated that there is pitta dominance in pandu vyadhi[20] He further described about the *Bala-Varna Hani* of *Garbhini* in 6th month of pregnancy which can be correlated with feeling of tiredness, loss of strength and complexion. In 7th month *Mamsa-Shonita Kalantama* can be said as more loss of flesh and blood.[21] To fulfil the demands of pregnancy, a comprehensive *Garbhini paricharaya* is described in *Ayurvedic* texts. Due to *Apathya Aahar-Vihar* abnormal *rasa Dhatu* gets formed. It further cause *Uttrottar Vikrit Dhatu Utpatti* and this may leads to pathology of *Garbhini Pandu*.

Anaemia in pregnancy manifests in *Rasavaha Shrotasa* but shows catastrophic effect on *Rasa* and *Rakata Dhatu* as well as whole body. *Rasavaha Shrotasa* gets pressurized due to development of foetus. So there is obstruction in *Rasavaha Shrotasa* and production of *Rasa Dhatu* does not take place properly and pregnant women shows symptom of *Pandu*.

DISCUSSION

As *Garbhini Pandu* is not directly described in *Ayurvedic* classics as a separate *Vyadhi,* but by giving different references in *Ayurvedic Samhitas* by many *Acharayas* the concept of *Garbhini Pandu* can be illustrated easily.

According to modern literature, during pregnancy many organs undergo physiological changes. Haematological changes – blood volume increases, plasma volume increases due to which haemodilution occurs that leads to physiological anaemia in pregnancy.

In Ayurveda, *Kashyapa* stated that *Garbhini* need not to be considered as a separate subject, so in case of *Garbhini Pandu, Nidan Panchaka* and *Chikitsa siddhanta* for *Pandu* can be adopted. As *Snehana* and *Virechana* are advised general line of treatment in *Pandu Roga.* But these are contraindicated in pregnancy therefore, there are limitations of treatment and difficult to treat according to dominance of *Doshas* in antenatal phase. There has been described the concept of *Garbhini Paricharya.* Also there are some herbal preparations described in *Charak Samhinta,* which are useful for the treatment and are safe in use for *Pandu* and there elemental iron has been analysed in some clinical studies. Some of these are.[22]

Preparations	Chemical Compositions	Iron content
Mandoor bhasma[1]	Fe_2o_3	37.5%
Dhatri lauh[2]	*Dhatri, Lauh Bhsama, Yashtimadhu, Amrita*	37.7%
Tanduliyak ghan[3]	Amaranthus viridis	61.58mg/100gm
Lauh bhsama[4]	Raw Fe turning	70.26%

The some other formulations for *Pandu* described by *Acharya Charak* are *Navayas Lauh, Mandoor Vatak, Gomutra Haritaki, Yograj, Shilajatu Vatak, Punarnava Mandoor, Dhatri Avleh.*[20]

REFERENCES

1. Textbook of obstretics by D.C Dutta, edition by Hiralal Konar 7th edition, amaemia in pregnancy, 260.
2. Deepika A Khandelwal, Article, Ayu, Oct-Dec, 2015; 36(4): 397-403.
3. *Ezzati M, Lopez AD, Rogens A, Vanden, Hoorn, s Murray CJ., 2002; 36: 1347-60.*
4. Vikram Sinai Talaulikar MD, MRCOG, University Colege Hospital, London UK. Article, Anaemia in pregnancy.
5. WHO VMNIS. Haemoglobin concentrations for the diagnosis of anaemia and assessment of severity. Vitamin and mineral nutrition information system. WHO, Geneva, Switzerland, 2011.
6. Daru J, Cooper NA, Khan KS Systemic review of randomized trials of the effect of iron supplementation on iron stores and oxygen carrying capacity in pregnancy. Acta Obstet Gynecal SScand, 2016; 95(3): 270-279.
7. Murray-Kolb L. Maternal mortality, child mortality, perinatal mortality, child cognition, and estimates of prevalence of anaemia due to iron deficiency. CHERG, 2012.

8. Breymann Christian Iron deficiency anaemia in pregnancy. Semin Hematol, 2015; 52(4): 339-347.
9. Harrison's Principles of Internal Medicine, 16th edition, 1. ISBN 0-07-144746-6.
10. Bothwell TH Iron requirements in pregnancy and strategies to meet them. Am J Clin Nutr., 2000; 72(1): 257s-264s.
11. Rammohan A, Awofeso N, Robitaille M-C (2011) Addressing female iron-deficiency anaemia in India: Is vegetarianism the major obstacle? ISRN Public Health, 2012.
12. Sharma JB, Shankar M. Anaemia in pregnancy. J Int Med Sci Academy, 2010; 23: 253-60.
13. Camaschella C. Iron deficiency anaemia: New Engl J Med., 2015; 372(19): 1832-1843.
14. Centres for Disease Control and Prevention Recommendeations to prevent and control iron deficiency in the United States. MMWR Recomm. Rep Morb Mortal Week Rep Recomm Rep., 1998; 47(Rr-3): 1-29.
15. World Health Organization WHO recommendations on antenatal care for a positive pregnancy experience. Geneva, World Health Organization, Switzerland, 2016.
16. World Health Organisation Logic model for micronutrient interventions in public health: vitamin and mineral nutrition information system. Geneva, World Health Organization, Switzerland, 2011.
17. Kapil U, Singh Bhadoria A. National iron-plus initiative guidelines for control of iron deficiency anaemia in India, 2013 The National Medical Journal Of India, 2014; 27: 27-9.
18. *Harita Samhita Tritiya Sthana*- I Edition Chapter 51/1, Version1, Varanasi: *Chaukhamba Krishnadas Academy, 2005; 456.*
19. *Harita Samhita Tritya Sthan*, 1st edition chapter51/1: 456.
20. *Charak Samhita,* published by Chaukhamba Bharti Academy, Varanasi, reprinted edition 2013, Chikitsa sthan chapter16.
21. *Charak Samhita, Sharir Sthan, Mahatigarbhavkranti Adhyaya 4/20-24.*
22. Dhiraj Singh Rajput, Rohit A Gokarn, Analytical Standardization Of *Mandoor Bhsama* incinerated Iron oxide.
23. Deepika khandelwal, Donga SB, Harish CR, Shukla VJ, IPGT & RA, Gujrat Ayurved University, Jamnagar. Impotance of Rasayan drugs in *Dhatri Luah* w.s.r to *Garbhini Pandu (*Iron Deficiency Anaemia).
24. Ritu Singh, D.C Singh Chauhan, Pravesh Tomar; *Tanduliyaka (Amaranthus Viridis):* Ahighly Nutritional Herb, International Journal Of Ayurveda And Pharma Research. ISSN:2322-0902(P)

25. SC Bhargava, KR Reddy, GVS Sastry: Identification studies of *Lauh Bhasma* by X-Ray diffraction and X-Ray fluorescence, AYU, 2012; 33: 193-195.