



EVIDENCE BASED MANAGEMENT OF PANDU (IRON DEFICIENCY ANEMIA) IN CHILDREN THROUGH AYURVEDA

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ABSTRACT

Iron deficiency anemia is a major health issue in children leading to symptoms like dizziness, fatigue, weakness and shortness of breath. This condition is described as Pandu in ayurvedic texts. Ayurveda offers a holistic solution to this problem. This article reviews the management approach of pandu through Ayurveda highlighting the research-based evidences in this field. Researches indicate that various Ayurvedic drugs like *Punarnavadi Mandura*, *Dadimadi Ghrita*, *Trikatrayadi Lauha*, *Pandughni Vati*, *Dhatrarishta*, *Phalatrikadi kwath* etc. give significant relief in symptoms of Pandu and increase hemoglobin level.

KEYWORDS : Pandu, Ayurvedic management of Iron Deficiency Anemia in children, Management of Pandu in children.

INTRODUCTION:

Anemia is a major health issue in children which leads to growth and developmental problems, as well as cognitive impairment in them. World health organization has defined anemia as 'a condition in which the number of red blood cells or the haemoglobin concentration within them is lower than normal'.¹ Median hemoglobin levels for child upto 4yrs, 5-7 years, 8-11 years and 12-14 years is 12.5 gm/dL, 13.0 gm/dL, 13.5gm/dL and 14.0 gm/dL respectively.² WHO estimates that 42% of children less than 5 years of age and 40% of pregnant women worldwide are anaemic. WHO data show that developing counties of South Asia like India, Pakistan, Afganistan, Bangladesh and that of African continent show >40% prevalence of anemia in children, as opposed to low occurrence of <20% in North American countries.³ Amongst various causes of childhood anemia, iron deficiency comprises the largest share. Data from NFHS-5 reveals that prevalence rate of anemia is 67.1 % in India and 58.8% in Uttarakhand.⁴ Based on the clinical features of *Pandu Roga*, such as *Alpa Rakto* (poor quality and reduced quantity of blood tissue), *Swetakshi* (pallor of palpebral conjunctiva), *Akshikoot Shotha* (periorbital edema), *Nashtagni* (impaired metabolism), and *Nirutshah* (fatigue), Anemia can be well correlated to the disease 'Pandu' described in Ayurveda.⁵ In Ayurveda perspective, *Pandu Roga* is a disease of *Rasavaha Srotas* caused by the predominance of *Pitta Dosh*.⁶

Pathophysiology and clinical features:

Iron is required for synthesis of heme ring in hemoglobin, which is a part of Red Blood Corpuscles. A dynamic interaction between heme and globin gives hemoglobin its unique properties in the reversible transport of oxygen.⁷ Decreased availability of iron in body leads to low hemoglobin values, which causes low oxygen carrying capacity of blood. This deficiency of oxygen causes symptoms like dizziness, fatigue, weakness and shortness of breath. Chronic state of anemia leads to growth impairment, developmental delay, decreased cognitive functions and low adult height of such children. Iron deficiency may occur due to decreased intake of iron rich food, like green leafy vegetables, decreased iron stores or increased losses through accident, malabsorption, piles, menorrhagia, intestinal worms, etc.

Principles of management:

Blood investigations like hemoglobin, hematocrit, RBC indices, TLC, DLC, platelet count, reticulocyte count, peripheral blood smear examination, Serum Iron, Serum ferritin, Total Iron Binding Capacity should be carried out to know the exact etiology of anemia. Iron deficiency anemia can be managed by supplementing iron through oral or parenteral route. The prophylactic dose of elemental iron is 1-2mg/kg/day while therapeutic dose is 3-6 mg/kg/day. Etiological factors like worm infestation, chronic blood loss should also be looked for and treated accordingly.

Ayurveda states that pandu can be managed by both Shodhana and Shamana treatment. For Snehana procedure, Triphala Ghrita, Tilavaka Ghrita, Dadima Ghrita, Danti Ghrita, Draksha Ghrita, Panchgavya Ghrita, Mahatikta Ghrita, Panchatikta Ghrita etc. can be used. After Snehana, Swedana Karma brings Doshas into Koshttha. Vamana and Virechana Karma can be performed in Panduroga after proper snehana

using Madanaphala and Haritaki respectively. Shamana Chikitsa means Palliative treatment. It is done according to predominance of Doshas and Lakshanas (symptomatic treatment). Lauha Bhasma, Mandura Bhasma, Pure Kaseesa, Shilajita, Vardhamana Pippali, Phalatrikadi Kwatha, Punarnavashtaka Kwatha, Vidangavaleha, Yogaraja, Shilajatvadi Vati, Navayasa Lauha, Mandura Vataka, Punrnavadi Mandura, Lauhasava, Punarnavasava are commonly used. Drugs like Krimi mudgar Rasa, krimi kuthar rasa and single herbs like vidanga churna can be administered orally in children with history of pica.

Research evidences on ayurvedic management of Pandu (Iron Deficiency Anemia):

The research evidences regarding ayurvedic management of Pandu are as follows:

1. In a clinical trial conducted on 50 patients of Pandu of 10-14 years of age, 500 mg of *Punarnavadi Mandura* and 10 ml of *Dadimadi Ghrita* was given twice daily with lukewarm water for 84 days. Statistically significant results ($P < 0.001$) were obtained in hemoglobin and other hematological parameters such as MCHC, MCV, PCV, reticulocyte count, peripheral blood smear, serum iron, serum ferritin, and total iron binding capacity.⁸

2. In a randomized, double-blind, placebo-controlled clinical study, 123 IDA children of 1 to 16 years were administered *Trikatrayadi Lauha* and a placebo for 10 weeks with a dosage of 0.5 ml/kg body weight in two divided doses. Trikatrayadi Lauha suspension gave statistically significant improvement in Hb%, TRBC, PCV, MCV, MCH, and MCHC. Hb % increased by 39.10%. Significant improvement in serum iron, TIBC and serum ferritin level was observed in trial group. In placebo group, improvement in the hematological parameters were not satisfactory.⁹

3. In a clinical trial conducted on 60 children aged 6-12 years suffering from IDA, drug Madhulai Manappagu was administered for 90 days. Hb increased from a mean of 8.1gms/dl to a mean of 13.5 gms/dl and the total RBC was increased from a mean of 3.32 to a mean of 4.5. Statistical analysis of the haematological parameters like Hb, RBC, Total RBC, ESR, PCV, MCV, MCH, MCHC and the biochemical parameters like serum iron, Ferritin levels and TIBC showed significant improvement.¹⁰

4. In an open label comparative clinical trial, 60 children of IDA between 2-16 years were divided into two groups. In group A and B, *Pandughni Vati* (trial drug) and *Punarnavadi Mandura Vati* (standard drug) were given respectively for a duration of 90 days in age specific doses. Both the drugs, Pandughni Vati and Punarnavadi Mandura Vati were found to be equally effective in the management of subjective parameters of anemia. The drugs significantly increased hemoglobin in patients of IDA.¹¹

5. In another open label clinical trial, 30 children of Pandu (IDA), between 6 to 12 years were given 10 – 15ml of *Dhatryarishta* in dose according to age for a period of 60 days. Highly significant effect was observed in relieving almost all the clinical features of IDA within the

duration of 60 days. The values of Haemoglobin and Mean cell indices showed a significant response to the drug.¹²

6. In another clinical study, 30 children of IDA were given phalatrikadi kwath for 30 days in age specific doses. The trial group showed significant increase in Hemoglobin and relief in subjective clinical parameters after 30 days.¹³

7. In a single blind clinical trial conducted at a hospital, Panduhara Yoga (Mandura Bhasma one part +Amalaki Churna ten parts) was administered in the dose of 110mg/kg in two divided doses with honey for 6 weeks. Hemoglobin level was improved with mean increase of 1.19gm/dl in three weeks and 2.64gm/dl in six weeks. 93.33% children showed very good improvement in clinical features.¹⁴

8. In a randomized, double blind placebo controlled clinical study, 69 IDA Children of 3-8 years were divided in 2 groups. Group-A (n=34) and Group-B (n=35) received Pippalyadi Yoga and placebo drug respectively in dose 100 mg/kg/day in two divided doses with luke warm water for 3 months. Pippalyadi Yoga showed statistically significant increase of haematological values like blood Hb%, total RBC count, PCV, MCV, MCH and MCHC with a mean increase of 2.107gm/dl of Hb after 3 months.¹⁵

DISCUSSION:

Ayurveda explains Pandu as a Pitta Pradhana Tridoshaja Vyadhi, affecting Rasa-Vaha and Rakta-Vaha Srotas. It also affects dhatus like Rasa, Rakta and Medas. Low digestive fire and Ama are the underlying causes of Pandu Roga. In Ayurveda, the treatment principles of Pandu aim at correction of this digestive fire as well as supplementation of Iron. Thus, drugs like *Punarnavadi Mandura*, *Dadimadi Ghrita*, *Trikatrayadi Lauha*, *Pandughni Vati*, *Dhatrarishta*, *Phalatrikadi kwath*, which have *agnivardhak* properties and contain *lauh* as an ingredient show beneficial effect in iron deficiency anemia. Clinical studies also show significant relief in objective clinical features and improvement in hematological parameters along with decreased occurrence of side effects in Pandu. Systematic review available on effect of ayurvedic drugs in anemia is limited by the low number of good quality RCTs conducted on the topic.

CONCLUSION:

Ayurveda offers an excellent management of iron deficiency anemia which is proved by various clinical studies. More such studies of good quality need to be conducted to further strengthen the evidences regarding the same. More systematic reviews and meta-analysis can be performed. Due to significant effectiveness of Ayurveda drugs, they may be included in national anemia prophylaxis program to extend the benefits of indigenous drugs to masses, particularly children.

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