Efficacy Of Herbal Formulation As Amalakyavaleha In Pandu W.S.R To Anemia In Children

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ABSTRACT: Anemia is a common micronutrients disease affect health status of very large population of whole world. Iron deficiency is most common cause of anemia. Ayurveda described Pandu Roga which correlate with anemia. Ayurveda mentioned as causes, symptoms and treatment of Pandu. Pandu Roga involves lack of hemoglobin due to poor intake of iron through dietary sources. Poor absorption and digestive problems may also lead anemia. The characteristic feature of diseases involve discoloration of skin, pita and presence of Ketaki dhuli nibh chaya. Ayurveda described it as “Varnoplakshita roga” which indicates change in colour. The clinical symptoms involve loss of appetite, palpitation, Pandutwa and fatigue. In the classification the disease Pandu felt in the group of Varna in which there are significant changes in the normal color of the body. The detail description of Pandu Roga its classification starts from Ayurvedic Samhitas only. Pandu Roga is one of the diseases mentioned in Ayurveda characterized by whitish discoloration of skin due to loss of blood. The disease is comparable with anemia in the modern medical literature. The incidence of problem is high in school going children, adolescent and pregnant women. The main nutrients involved in the synthesis of hemoglobin are iron, folic acid and Vitamin B12. In public health terms, iron deficiency is by far the first cause of nutritional anemia worldwide. Folic acid deficiency is less widespread and is often observed with iron deficiency anemia. Vitamin B12 deficiency is far rare. Therefore, the focus in this article is on Iron-deficiency anemia in children.

Key Words: Anemia, Varnoplakshita roga, Vaivarna, Pandutwa, Folic acid deficiency, Vitamin B12 deficiency, Nutritional deficiency anemia
INTRODUCTION:

The world Pandu has been derived from “Padi nashne dhatu” by adding “Ku” pratyay in it, the meaning of which is always taken in a sense of “Nashan” i.e. loss. As Pandu which is classified and named according to change of color, therefore, “Nashan” should be considered in the sense of “Varna” or color which is further clarified by Charaka with the word Vaivarna. Thus, Pandu is a disease in which there is Vaivarna or change in the normal color of the body.¹

Ayurveda is the science of life which focuses on the maintenance of positive health and eradication of ailments in the disease through its holistic approach, life style practices, dietary habits as well as safer medication. Pandu rog occurs in children some time because of Mritika Bhakshan and maximum by inadequate nutrition. According to Ayurvedic Acharya, there are main five types of Pandu roga²

- Vatika Pandu
- Pattika Pandu
- Kaphaja Pandu
- Tridoshaja / Sannipataja Pandu
- Mrtika bhakshanjanya Pandu

Acharya Shusruta described four types of Pandu roga. He has not mentioned Mrtika bhakshanjanya Pandu³. Some others types of
Pandu roga are also described (which are assumed as complication of Pandu) named Lagharaka or Laghavaka, Alasa, Panaki and Halimaka.

Pandu rog is compared with anemia i.e. Iron deficiency anemia in modern sciences. Anemia disease in both developed and developing countries is present with its higher prevalence rate in infant, school going children, adolescence and women of child baring age.

An abnormally low hemoglobin level due to pathological conditions is defined as anemia. Iron deficiency is one of the most common but not only cause of anemia. Other cause of anemia includes chronic infections particularly malaria, hereditary hemoglobinopathies, HDN, pica history, hemolysis, jaundice, folic acid deficiency etc. It is worth noting that multiple cause of anemia can coexist in individual or in a population and contribute to the severity of anemia.

**Iron-deficiency-anemia (IDA)**

Iron is essential for multiple metabolic process including electron transport, DNA synthesis and electron transport. In severe iron deficiency, low level of iron containing enzymes affect immune and tissue function. Iron deficiency can also result in diminished growth and learning. Therefore, when decrease in total body iron content is severe enough to diminish erythropoiesis and cause anemia.

Iron deficiency results from diminished dietary iron absorption in the proximal small intestine or excessive loss of body iron. Iron deficiency in older children is usually caused by dietary deficiency; the absorption of iron is further impaired by dietary constituents that lowers the absorption of non-haeme iron, e.g. phytates, phosphates and tannates. Recurrent infection such as hookworm infestation and malaria worsen the problem. Cognitive impairment, decreased physical capacity and reduced immunity are commonly associated with iron-deficiency-anemia. In severe iron deficiency anemia, the capacity to maintain the body temperature may also be reduced. Severe anemia is also life threatening.

**EPIDEMIOLOGY :**

Anemia is considered as one of the most significant problem occurring due to nutritional deprivation which hinder the linear growth and development of children.
The incidence rate of anemia is 46% globally. 2 billion peoples are suffering from iron deficiency anemia i.e. approximate 1/3 of the whole population. Adolescents constitute more than 20% of Indian population and more than 50% of them suffer from iron deficiency anemia. NFHS IV 2015-16 suggest about the prevalence of anemia in Indian children is 59% having Hb <11mg/dl but its rate is also higher among the rural children. W.H.O. report 2002 titled “Reducing risk and promoting health life” mentions iron deficiency as 9th of 26th preventable risk to disease, disability and death in the world today.

Anemia is present when the hemoglobin level is more than two standard deviation below the mean for the child age and sex. According to 3rd National Family Health Survey(NFHS3), 79% children have anemia, including 71% of urban children and 84% of those in rural areas.

**HERBAL MEDICINES:**

**AMALKI**

**CHEMICAL COMPOSITION:**

A good source of vitamins C, carotene, nicotinic acid, riboflavin, D-glucose, D-fructose, myo inositol, pectin with D-galactoronic acid, mucin, indole acetic acid and four other auxins, tannin, polyphenolic compounds, ellagic acid, alkaloids, phyllantidine and phyllatine.

**PHARMACOLOGICAL ACTION AND USE:** For acute toxicity, including median lethal dose(L.D.50) of Amla; it was administered at rate of 250,500 and1000mg/kg-body weight to albino rats of group 1 were given normal saline to serve as control. There was not observed any mortality rate.

The fruits are astringent, cooling, carminative, digestive, laxative and tonic. They are useful in dyspepsia, colic, flatulence, hyperacidity, peptic ulcer, anemia, hepatic disorder, diarrhea, skin disease, inflammation, jaundice and grayness of hair.

**SUNTHI**

**PHARMACOLOGICAL ACTION AND ITS USE:**

The dry ginger is emollient, appetizer, laxative, stomachic, stimulant, anodyne, anthelmintic and carminative. It is useful in dyspepsia, piles, hyperacidity, abdominal pain, vomiting and distress of pharynx,
cardiac disorder, inflammation and Rheumatoid arthritis. This medicine is considered as an adjunct to many tonic and stimulating remedies.

Shunthi as ingredient of Taalisadia churna 5, 50, 300, 2000mg/kg for a period of at least 24 hours were allowed between dosing of each animal and then were observed for 14 days. No toxicity symptoms up to dose level of 2000mg/kg P.O. in sub acute toxicity study.

The vital organs of animals treated with Taalisadia churna for 28 days did not show any histo-pathological evidence of pathological lesion.

**Pippali**:

Kaasahara, Shirovirechaka, Vamana, Hikkanigrhana, Triptighna, Deepaniya, Shoolaprashamana.

According to toxicity, study has been carried out in albino rats receiving the first drug dose level maximum upto five times higher (3750 mg/kg) then therapeutic equivalent dose (750 mg/kg). No mortality was observed in any group.

Sub-Chronic toxicity- It has been carried out in two group for therapeutic equivalent dose (2250mg/kg) for 45 days. Pippali churna up to this dose produce any change in biochemical parameter. Therefore, after long duration, administration of this medicine has no serious toxicity potential.

**Mulethi**:

**PHARMACOLOGICAL ACTION AND ITS USE**:

Glycyrrhizin shows anti-arthritic, anti-inflammatory, pemphigus.

Glycyrrhetic acid shows anti pyretic activity.

Glycyrrhetic acid drops also found to be significant anti-diuretic effect.

**Drahska**:

Due to snigdha and guru it helps to overcome Vataj-pittaja dosha.

This is mainly used in jvara, kamala, rajayakshma, daha and trishna, antifungal, antioxidant, antulcer, wound healing, antimutagenic. In Rohini, decoction of Draksha is used. In Chhardi, cold grape juice should be given.
TOXICOLOGICAL STUDIES: In acute toxicity study, *Vitis vinifera* fruit produced by means of organic farming. At a single dose of 2000mg/kg did not show any toxicity sign which suggest that *Vitis vinifera* practically nontoxic extract did not show detectable abnormalities in organ weight, hematological parameter and clinical parameter.

**Therapeutic evaluation:** Acc. To modern research, it has Anti-oxidant, Hepato protective actions, Antimicrobial, Antiviral effects and Anti-inflammatory activities.

**VANSLOCHANA**

Therapeutic evaluation: Acc. To modern research, it has Anti-oxidant, Hepato-protective actions, Antimicrobial, Antiviral effects and Anti-inflammatory activities.

**MADHU(HONEY)**

Honey is a natural sweet substance produced by honey bees by or enzymatic transformation of floral nectar ingested by them and deposited in the cells of hives or combs & is most valued as well as appreciated natural substances known to mankind since ancient times. Honey is the most rich resources of carbohydrate. Honey is called as *Madhu* in Ayurveda.

**Properties according to modern sciences:**

Various experiments & studies on honey have shown that it posses antiseptic, antimicrobial, anti-inflammatory, sedative, mild laxative, healing & cleansing properties.

**Properties of fresh & old honey in Ayurveda:**

Fresh honey has *Bringhana guna*, does not mitigate *Sleshma* very much and is a laxative. Old honey reduces fat and obesity.
### Lay out of *Amalkyavaleha* formulation in tabulated form

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Drugs</th>
<th>Latin name</th>
<th>Properties</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Amalaki</td>
<td><em>Embelica officinale</em></td>
<td>Amlapitta, Parinamshula, Udavarta, Yakrit vikara, Daurbaly</td>
</tr>
<tr>
<td>2</td>
<td>Sunthi</td>
<td><em>Zingiber officinale</em></td>
<td>Rochana, Deepana, Paachana, Triptighana, Vatanuloman Aruchi, Hrillasa, Chhardi, Agnimandya, Ajirna,</td>
</tr>
<tr>
<td>3</td>
<td>Pippali</td>
<td><em>Piper longum</em></td>
<td>Triptighna, Deepaniya, Shoolaprashamana Vamana</td>
</tr>
<tr>
<td>4</td>
<td>Mulethi</td>
<td><em>Glycyrrhiza glabra</em></td>
<td>Chardinigrahana, Sonitasthapana, Vamanopaga, Asthanopaga, Kanthya.</td>
</tr>
<tr>
<td>5</td>
<td>Draksha</td>
<td><em>Vitis vinifera</em></td>
<td>Jvara, kamala, rajayakshma, daha and trishna, antifungal Chardi</td>
</tr>
<tr>
<td>6</td>
<td>Vamslochana</td>
<td><em>Bambusa arundenaceae</em></td>
<td>Anti-oxidant, Hepatoprotective actions, Antimicrobial, Antiviral effects and Anti-inflammatory activites.</td>
</tr>
<tr>
<td>7</td>
<td>Madhu</td>
<td><em>Mal depuratum</em></td>
<td>Agnideepana, Chakshuya, Prasadana, Ropana, Sandhana, Shodhana, Tridoshaprashamana, Visaghna</td>
</tr>
</tbody>
</table>

### DISCUSSION

Though every age group is susceptible to the affliction of *pandu roga*, it is more common in small children due to intake of iron deficient diet or less iron content in diet. Families of poor income group are unable to afford proper diet and due to improper and imbalanced diet, children of those families may get the disease. As per the WHO report iron deficiency is most
common among group of low socioeconomic status. Pandu roga is equally prevalent in both vegetarian and non-vegetarian. The disease is more prevalent in the children having the Prakriti dominant in Pitta. As Pandu roga is Pitta dominant tridoshaja vikara and undernutrition is commonly found in Vata dominant person so probably this might be the reason of majority of patients of being Vata-Pitta Prakriti. Mandagni and Madhyam Kostha are observed in maximum patients. Madhyam Kostha showing dominance of Kapha leads to improper digestion, which is the prominent cause of any disease. Kapha dosha is predominant during childhood period and Kapha dosha also play an important role in the pathogenesis of disease.

CONCLUSION :

In this review article, an effort is made to prepare a formulation an Avaleha (Amalakyavaleha), helpful in the management of Pandu(Anemia) roga. The article may be helpful in enhancing the use of herbal drugs in general practices.

In Amalakyavaleha, the ingredients are having Tridoshahara property, so it becomes helpful in treating Tridoshaja vyadhi Pandu. Analysis of pharmacodynamic property of Amalakyavaleha shows that maximum ingredients are having Katu and Tikta rasa and predominant in Laghu guna. These Tikta and Katu rasa perform Agnideepana karma which increase the metabolism and reduces the formation of Ama. These all properties assist in vighatana of Pandu roga.

Amalakyavaleha is an iron rich compound formulation which provides iron in optimum quality which is primarily desired in the management of Pandu roga.

Thus Amalakyavaleha does Samprapti vighatana of Pandu roga at various level and Vyadhiviparita chikitsa along with Rasayana effect so that drug can be used for longer duration to get maximum effect further helpful in improving the hemoglobin as well as general health.

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