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## ROLE OF AYURVEDA IN THE MANAGEMENT OF MRITIKABHAKSHANJANYA PANDU W.S.R. PICA AND IRON DEFICIENCY ANEMIA: A CASE STUDY

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### Abstract

Pica is a condition where individual, particularly children, consume inedible non-nutritive substances like soil, chalk, rubber, pencil, charcoal etc. It is associated with risks of lead poisoning, iron deficiency anemia, and parasite infestation. This is a case of severe iron deficiency anemia (IDA) and chronic severe Geophagy (pica of soil). Clinical manifestations of iron deficiency anaemia encompass symptoms such as pallor, anorexia, irritability, and pica. These features are closely parallel with Pandu Roga as described in Ayurveda classics. Helminthiasis stands out as a major cause of Pica, with these symptoms specifically mentioned in Mrittika Bhakshan Janya Pandu. The present case involves a 1-year-5-month-old girl with symptoms of recurrent fever, irritability, nausea, anorexia, and pica persisting for 6 months. Investigations revealed iron deficiency anemia and roundworm infestation. The treatment done includes Apakarshana (Ayurveda measures for expelling worms or parasites), Prakritivighata (disrupting the natural dwelling environment), Nidan Parivarjana (prevention from the cause), and Shatprasritik Basti, along with oral drugs to address symptoms and restore the hemoglobin level.

**Keywords:** Pica, IDA, Roundworm infestation, Shatprasritik Basti.

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### Introduction

Consuming inedible non-nutritive materials for at least a month, such as plaster, charcoal, paint and soil is known as pica. It is common in kids under the age of five years. The exact cause of pica has not been understood yet. Lead poisoning, IDA, and parasite infestation are among the risks associated with pica in children [1]. It is estimated that 40% of all children aged 6–59 months are affected by anemia worldwide [2]. Clinical manifestations of iron deficiency anaemia encompass symptoms such as pallor, anorexia, irritability, and pica [3]. These features closely parallel those associated with *Pandu Roga* as described in *Ayurveda* classics. It is characterized by a diminished *Varna* (pallor) and *Raktakshaya* (deficiency or reduction in the quality and quantity of hemoglobin/blood). The symptoms of *Pandu Roga*, such as *Aruchi* (loss of appetite), *Jwara* (fever), *Panduta* (pallor), *Gaurav* (heaviness), and *Tandra* (lethargy), *Karshya*

(emaciation) reflect imbalance in *Saptadhat* [4]. Helminthiasis stands out as a major cause of Pica, with these symptoms specifically mentioned in *Mritika BhakshanJanya Pandu* [5]. The symptom of *Panduis* also mentioned in *Purishajakrimi* (intestinal parasites). [6] Due to the distinct nature of the causative factor, this type of *Pandu* necessitates a specialized treatment approach. The treatment involved *Shodhana* (detoxification process) and *ShamanChikitsa* (balancing *dosha*) along with a diet rich in iron, with hematopoietic properties, and prevention of underlying factors contributing to the disorder.

### Patient information

A 1-year-5-month-old girl presented at our hospital in August 2023, with symptoms including recurrent fever, anorexia, indigestion, nausea, altered bowel habits, and pica persisting for 8 months. Upon physical examination, the patient exhibited pallor, and there was no history of major illnesses. The patient belonging to a lower middle class from Muslim community had been regularly ingesting soil daily since 2022. Investigations, such as serum ferritin, peripheral blood smear, Hb electrophoresis, and abdominal ultrasound were carried out. The patient reported with decreased haemoglobin

(6.9 gm/dl, n:11.5-16.5gm/dl), and stool examination showed ova of roundworm, other findings were non-significant. The patient was brought to the hospital to receive better care and treatment.

**Developmental History:** According to the parents, the child achieved all developmental milestones within the expected timeframe.

**Occupational History:** Mother is a home maker while father owns a medical shop.

**Drug History:** The child has a history of frequent illness and antibiotic intake.

**Family History:** There is no significant family history of Pica or anaemia.

**Birth History:** The baby was full-term normal delivered at the hospital with immediate cry observed after birth, and the birth weight was 2.5 kg.

**Postnatal:** No history of neonatal jaundice or seizures, bleeding disorder, blood transfusion, any surgical illness etc, and the baby had never required admission to the Neonatal Intensive Care Unit (NICU) or indoor patient department of hospital for treatment of any diseases.

**Immunization History:** The baby has consistently received all vaccines according to their age.

**General Examination:** Upon the first visit to the OPD at the age of 1 year 5 months, the child's weight was 10kg ( 49.2 weight for age percentile, Z-Score -0), length was 73 cm (1.0 length for age percentile, Z-Score -2.3), and head circumference was 49 cm ( 98.3 head circumference for age percentile, Z-Score 2.1). The body temperature was within the standard parameters, and the heart rate was 102 per minute. The tongue showed a slight white coating. The sclera appeared white. The child was conscious and active but lean-thin, and examinations of the cardiovascular and respiratory systems revealed no abnormalities.

**Diagnostic Assessment**

Initial blood tests revealed decreased haemoglobin level (6.9g/dl; n: 11-16.5), MCH level 52.25Pg (n:76-96 Pg), MCHC 25.8gm/dl; (n:32-36gm/dl), RBC shows anisocytosis with hypochromic RBC as well as moderate lymphocytosis- WBC 10600cell/UL (n:4000-11000cell/UL), Abdominal ultrasound showed all the abdominal organ within normal limit as per age.

**Therapeutic Interventions**

The patient underwent a thorough examination in the OPD, were prescribed oral medication and a guide for parents for an appropriate diet. Moreover, the parents were counselled for the IPD admission of child for *Basti* therapy. Following a four-month gap, the patient was hospitalized in the IPD and released after a 12-days treatment, with instructions for continued oral medication on discharge from the hospital. Subsequent follow-ups were set at monthly intervals, with consistent monitoring to assess the efficacy of the oral medicines. The

chronological details of the interventions can be found in [Table 1].

**Table 1: Therapeutic intervention**

Days	Symptoms	Name of the drug used orally
1/7/2023 (OPD visit)	Recurrent fever, anorexia, abdominal distension, nausea, altered bowel habits, irritability, perianal itching at night, worms in stool and severe pica	<ol style="list-style-type: none"> <li>1. <i>Yastimadhu Churna</i> 250gm+ <i>Krimipatan Churna</i> 250gm + <i>Vara Churna</i> 1gm twice daily with <i>Madhu</i>.</li> <li>2. <i>Sitopaladi Churna</i> 1gm + <i>Godanti Bhasma</i> 250gm + <i>AmritaSatwa</i> 250mg with <i>Madhu</i>.</li> <li>3. Syrup <i>Amyron</i> 2.5 ml twice daily with water.</li> <li>4. Syrup <i>Boniheal</i> 2.5 ml once daily with water.</li> </ol>
4/7/2023 (OPD visit)	Mild relief in abdominal distension, rest symptoms same as above.	<ol style="list-style-type: none"> <li>Treatment 1, 2, 3, 4 continued</li> <li>5. Syrup <i>Balchaturbhadr ika</i> 5ml twice daily.</li> </ol>
2/8/2023 (OPD visit)	Relief in anorexia, nausea rest symptoms same as above.	Treatment 2, 5 continued
10/10/2023 (OPD visit)		Treatment 2, 5 continued
12/10/2023 (IPD Admission)	Altered bowel habits, irritability, perianal itching at night, worms in stool and severe pica	<ol style="list-style-type: none"> <li>1. <i>Yastimadhu Churna</i> 250gm + <i>Amalki Churna</i> 1 gm + <i>Dhatri Lauha</i> 125 mgtwice daily with <i>Madhu</i>.</li> <li>2. Tab <i>Chitrakadi Vati</i> 1/2tab twice daily with water.</li> <li>3. <i>Krimipatan Churna</i> 1 gm once daily with water.</li> <li>4. <i>Shatprasritik Basti</i> 50 ml for twelve days.</li> </ol>

19/10/2023 (Advice On Discharge )		<ol style="list-style-type: none"> <li>1. <i>YastimadhuChurna</i> 250gm +<i>VaraChurna</i> 1gm +<i>DhatriLauha</i> 125 mg twice daily with <i>Madhu</i>.</li> <li>2. Syrup Amyron 2.5 ml Twice daily with water.</li> <li>3. <i>KrimipatanChurna</i> 1gm Twice daily with water.</li> </ol>
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**Table 2. Ingredients of Shatprasritik Basti [7]**

Sr. no	Ingredients	Amount
1.	<i>Madhu</i> (honey)	2.5 gm
2.	<i>Saindhav Lavan</i> (salt)	250 mg
3.	<i>Panchtikta Ghrita</i>	3 ml
4.	<i>Dadimastak Kalka</i>	5gm
5.	<i>Kashaya</i> (decoction prepared by following ingredients)	100 ml
	<i>Vidang</i> ( <i>Emblia ribes</i> )	1gm
	<i>Triphala</i> Contain <i>Haritiki</i> ( <i>Terminalia chebula</i> ), <i>Bibhitiki</i> ( <i>Terminalia bellirica</i> ), <i>Amlaki</i> ( <i>Emblicia officinalis</i> )	1gm
	<i>Shigru</i> ( <i>Moringa oleifera</i> )	1gm
	<i>Madanphal</i> ( <i>Randia spinoza</i> )	1gm
	<i>Musta</i> ( <i>Cyperus rotundus</i> )	1gm
	<i>Mushak Parni</i> ( <i>Teramnus labialis</i> )	1gm

### Follow-Up and Outcome

The patient was assessed on the basis of signs and symptoms, after one month, her clinical condition appeared normal. Blood tests revealed improvement in results. Additionally, stool microscopic examination yielded negative results. Which is described in Table 3.

Table 3. Observation before and after treatment

Parameter	Before Treatment(3/7/2023)	After Treatment (26/9/2023)
Hb%	6.9 gm/dl (n:11.5-16.5gm/dl)	8.2 gm/dl (n:11.5-16.5gm/dl)
WBC	10600cell/UL (n:4000 -11000cell/UL)	10.5 DE (n:3.5-10 DE)
MCH	13.5Pg (n:27-32Pg)	15.8Pg (n:27-32Pg)
MCHC	25.8g/dl (n: 32-36g/dl)	31.7g/dl (n: 32-36g/dl)
Stool Examination	Ova of Round Worm Present (16/9/2023)	Ova of Roundworm Negative (26/9/2023)

### Discussion

*Pandu Roga* is identified as the consequence of *Rasa Pradoshaja Vikara*. There is a significant involvement of *Pitta* in the initiation of this condition. Five specific types of *PanduRoga* include *Vataj*, *Pittaj*, *Kaphaj*, *Sannipataj*, and *Mrittika Bhakshan Janya Pandu*, each characterized by distinct origins, pathologies, and symptoms [7]. In this case, the patient's history reveals a regular consumption of soil leading to the diminution of *Agni* (digestive fire). The soil remain sun digested and in turn, leads to the obstruction of *Rasavaha Srotas* (cellular and other body fluid transporting channel) and *Raktavaha Srotas* (blood transporting channel). Consequently, the patient develops symptoms such as fever, anorexia, and altered bowel habits as manifestations of this pathological process. The genesis of *Purishajkrimi* is closely associated with *Kapha* and *Kleda* (fluid component) [8]. The stasis of soil in the intestine due to *pica* had contributed significantly in the development of intestinal parasites. These parasites, in turn, resulted into anemia in patient. A comprehensive treatment strategy of *Udarkrimi* (intestinal worms), including *Apakarshana*, *Prakritivighata* and *Nidanparivarjana* was applied [9]. *Shatprasritik basti* is indicated in the treatment of *Krimi*, as mentioned in *Siddhistan*[10]. This *Basti* is administered as part of the *Shodhana* process. *Shatprasritik Basti* employs drugs with predominant *KatuRasa* (pungent taste), *Katu Vipaka* (post-metabolic effect of a food), and *Ushna Veerya* (potency), coupled with potent *Karshana* properties. These characteristics aid in extracting or eliminating *Krimi* from *Pakwashaya* (intestine), and also hinder their growth and activity. The *KatuRasa* contributes to *Upashoshana*, or drying of *Kleda* and have *Krimighna* property [11]. The *Shatprasritik KrimighnaBasti*, with its specific *Krimihara* action, expels *Dosha* and *Krimi* from the *Pakwashaya*, providing therapeutic relief. *Saindhav lavan* (Rock salt) stands out as a superior salt with qualities that make it an excellent digestive appetizer and offer overall wholesomeness, including the ability to alleviate all three *Doshas* [12]. Additionally, it eliminates stomach worms, controls vomiting, and facilitates the cellular absorption of minerals [13]. *Panchtikta Ghrita*, comprising herbs like *Vasa* (*Adhatodavasica*), *Nimba* (*Azardirachta indica*), *Guduchi* (*Tinosphora codifolia*), *Kantakari* (*Solanum surratance*), *Patola* (*Trichosanthedioica*), and *Ghrita* (clarified butter), is beneficial in *Visamjwar* (fever), and *Krimi Roga*. [14] *Pancha Tikta Ghrita* contains drugs with antimicrobial or *Krimighna* properties [15]. *Dadimastak churna*, consisting of *Dadima* (*Punica granatum*), *Tugakshiri* (*Borassus flabellifer*), *Twaka* (*Cinnamomum zeylanicum*), *Ajamoda* (*Apium graveolens*), *Dhanyaka* (*Coriandrum sativum*, *Sugandhbala* (*Valeriana wallichii*)) and, *Pippali* (*Piper longum*), which exhibits properties such as *Deepan*, *Aruchinasanam*, *Jwarnasak*, and *Grahaniroghar* [16]. *Dadima* in particular has antioxidant activity, and pomegranate extract showed strong hematinic and anti-anemic properties [17]. While *Pippali* has anti-amoebic

properties [18] and *Sugandhabalaha*s antihelminthic properties [19]. By addressing the root causes and eliminating the imbalances related to *Dosha* and *Kleda* through the administration of *Shatprasritik Basti*, we aim to effectively treat *Udarkrimi* and ultimately *Mrittika Bhakshan Janya Pandu*. Additionally, the incorporation of *Nidan Parivrjan* ensures the avoidance of factors that may contribute to the recurrence of the condition. The combined approach of *Sodhan* and *Saman* helps in both cleansing the system and restoring balance to alleviate the symptoms and consequences of *Krimi*, including anemia in patients. In conjugation with *BastiChikitsa*, oral drugs like *Yastimadhu*, *Sitopaladi*, *Godanti Bhasma*, and *Krimipatan Churna* are administered for symptomatic treatment.

### Conclusion

Anemia is a common symptom among all five types of *Pandu*. The treatment approach for *Pandu* depends on its underlying causes and types. The current case diagnosed as *Mritikabhakshanjanya Pandu* (Iron deficiency anemia) caused by the ingestion of soil, was successfully managed by *Apakarshana* (*Ayurveda* measures for expelling worms or parasites), *Prakritivighata* (disrupting the natural dwelling environment), *Nidan Parivarjana* (prevention from the cause), and *Shatprasritik Basti*.

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### Conflict of Interest

Nil

### Informed Consent

Taken

### Ethical Statement

Nil

### Author Contribution

All authors contributed

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