

## Therapeutic Efficacy of *Mandura Bhasma* and *Rohitakarishtha* in Severe Anaemia: A Classical *Ayurvedic* Approach

Subhabrata Sarkar,<sup>1\*</sup> Anuradha Bharti,<sup>2</sup> Shalini Gupta,<sup>3</sup> Tuhin Kanti Biswas<sup>4</sup>

<sup>1</sup> Final Year PG Scholar, <sup>2</sup> 2<sup>nd</sup> Year PG Scholar, <sup>3</sup> Final Year PGDNC Scholar, Department of *Kaumarbhritya/Balroga*, Faculty of Ayurveda, IMS, BHU, Varanasi, India.

<sup>4</sup> Professor, Department of Kayachikitsa, J. B. Roy State Ayurvedic Medical College and Hospital, Kolkata, West Bengal, India.

### ABSTRACT:

Severe anaemia remains a major public health issue among children, particularly in low-resource settings. Iron deficiency is the most common cause, and while conventional iron supplements are effective, they often cause gastrointestinal side effects and poor compliance. *Ayurveda* offers traditional remedy for anaemia, with historical usage in paediatric cases. A 10-year-old child presented with symptoms of pallor, fatigue, and reduced appetite. Laboratory investigations revealed severe anaemia. After ruling out haemolytic and malignant causes, a treatment regimen including *Mandura Bhasma*, *Rohitakarishtha* and iron-rich dietary recommendations was initiated. In between time, continuous monitoring of haemoglobin, iron profile levels and clinical improvement noticed. By the end of the treatment period, the child's haemoglobin level increased significantly. Clinically, there was drastic improvement in energy levels, appetite, and overall well-being. No adverse effects were reported throughout the intervention. This case suggests that *Mandura Bhasma* and *Rohitakarishtha* in combination with *Ayurvedic* supportive therapies can be a safe and effective approach in the management of severe anaemia in children. Further controlled studies are recommended to substantiate these findings and standardize pediatric dosing guidelines.

**KEYWORDS:** Herbal hematinic, Iron deficiency anaemia, *Mandura Bhasma*, *Pandu*, *Rohitakarishtha*.

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### \*Corresponding Author:

**Dr. Subhabrata Sarkar**

Final Year PG Scholar,  
Department of *Kaumarbhritya/Balroga*,  
Faculty of Ayurveda, IMS, BHU, Varanasi, India  
Email: [subhabsarkar.013@gmail.com](mailto:subhabsarkar.013@gmail.com)

## INTRODUCTION:

Anaemia, particularly Iron Deficiency Anaemia (IDA), is one of the most prevalent nutritional disorders affecting children globally. It is estimated that nearly 50% of children under the age of 5 in developing countries are anaemic, with iron deficiency being the leading cause. IDA in children results from inadequate dietary intake of iron, poor absorption, increased physiological demands during growth, or chronic blood loss due to infections or parasitic infestations<sup>[1]</sup>. Clinically, it manifests as pallor, fatigue, irritability, poor concentration, decreased physical endurance, and delayed growth and development. *Pandu Roga* in children is a well-recognized condition in *Kaumarbhritya Balrog*. This case report presents the clinical outcome of administering *Mandur Bhasma* and *Rohitakarishtha* in a 10 years old child diagnosed with severe iron deficiency anaemia. The purpose of this report is to explore the integrative potential of *Ayurvedic* interventions in managing pediatric anaemia, highlight the conceptual parallels between *Pandu Roga* and IDA, and suggest a need for further evidence-based research to validate traditional therapies in modern clinical settings.

**Anemia in children:** When the blood haemoglobin level is two standard deviations below the average for the given age and sex, it is referred to as anaemia. Anaemia is defined physiologically as a condition in which tissue hypoxia results from insufficient blood oxygen carrying capacity. The haemoglobin level at which symptoms of anaemia develop depends on two factors, the rate of development of anaemia and state of the cardiovascular system.

**Iron deficiency anemia** <sup>[1]</sup> When the body's total iron concentration is low enough to maintain erythropoiesis and result

in anaemia, it is known as iron deficiency anaemia. Iron deficiency may be caused by excessive bodily iron loss or decreased proximal small intestinal absorption of dietary iron. Dietary history, including excess cow milk consumption, weaning foods, and supplementation, is crucial. Pica (geophagia) raises the possibility so also lead poisoning and infections. In cases of severe iron deficiency anaemia, angular stomatitis, glossitis, koilonychia (spoon shaped nails), are observed. Hookworm infestation is one of the commonest cause of anaemia in childhood ages, that is why history of deworming is very important. The incidence of anaemia in children is 55.9% in urban areas, 59.4% in rural areas, and 58.4% in total, according to data from the National Family Health Survey (NFHS-4).<sup>[2]</sup>

***Pandu in Ayurveda*** <sup>[3]</sup> In the context of *Ayurveda*, a condition analogous to anaemia is described as *Pandu Roga*. The term *Pandu* denotes paleness or discoloration of the skin, which is one of the hallmark features of this disorder. Classical *Ayurvedic* texts, including *Charaka Samhita* and *Sushruta Samhita*, describe *Pandu* as a disease arising primarily due to the vitiation of *Pitta dosha* and impairment of *Agni* (digestion power), leading to improper digestion and assimilation of nutrients. This ultimately affects the formation of *Rasa* (plasma or tissue fluid) and *Rakta dhatus* (tissues), resulting in development of *Pandu*. *Pandu* is a predominantly *Rasa Pradoshaja Vikara*. There are various etiology mentioned in classical texts for *pandu* such as *Aaharaja Nidan* (dietary factors), *Viharaja Nidan* (lifestyles) and *Manasik Nidan* (psychic or mental factors).

***Samprapti:*** The pathogenesis of *pandu* is mentioned in flow chart-1 <sup>[3]</sup>

**Mrittika Bhakshanaja Pandu**<sup>[3]</sup> (Anaemia due to PICA)

Child indulge in habitual consumption of soil followed by aggravation and vitiation of *Doshas*. *Mrittika* (soil) having *Kashay Rasa* (astringent taste)-*Vata Prakopa*, *Ushara Rasa* (salty taste)-*Pitta Prakopa* and *Madhura Rasa* (sweet taste) leads to *Kapha Prakopa*. Due to *Ruksha Guna* of *Mrittika*, *Agnimandya* (indigestion) of *Dhatus* develops which leads to *Srota Avarodha* (obstruction of channels). This causes impairment of *Indriya* (sensory organs), *Bala* (strength), *Teja* (vitality), *Virya* (potency) and *Oja* (essence of all tissue or immunity). all these leads to occurrence of the following consequences: *Bala-Varna-Agni Nasha*, swelling of cheek-eyes-umbilicus-legs-scrotum, manifestation of diarrhoea mixed with *kapha* and *Rakta*.

#### CASE HISTORY:

A 10 years old child, came in *Kaumarbhritya Balrog* OPD on 13/05/25 of Sir Sunderlal Hospital BHU with complain of reduced appetite (on/off) since last 3 months, Fever (low grade) without chill/rigor on/off since last 3 months and Pain in both calf muscle on/off since last 2 months.

Child visited paediatric medicine OPD of AIIMS, Patna on 15/04/25 where preliminary investigations done to evaluate and diagnose the disease. Injectable broad spectrum antibiotics and 2 unit PRBC transfusion done on 04/05/25. Anemia (Hb-4.1g/dl) was corrected (Hb-5.1g/dl) but no such improvement in symptoms noticed by parent (TABLE -6 : TIMELINE)

#### Past history

No history of any trauma, bleeding, surgery. No history of malaria, dengue, typhoid. No any chronic illness.

#### Treatment history

Child took oral amoxicillin Clavulanic acid tab for 7 days, tab Paracetamol SOS, tab

albendazole 2 doses and an oral iron supplement 20 days ago of visit in BHU, consulting in OPD of AIIMS, Patna.

#### Diet history

Child is on mix diet and ground water intake, outside junk food and cow milk intake. History of pica (nonedible or nonnutritive objects like soil, chalk) since last 3 months.

#### Family history

No any history of familial hypertension, diabetes mellitus, thyroid dysfunction. But his elder sister also has complaint of iron deficiency anaemia.

**Cardiovascular system:** mid systolic grade 2, hemic murmur, Tachycardia (HR-130/min)

**Respiratory system:** normal vesicular breath sounds, bilateral equal air entry, no any added sound.

**Central nervous system:** child is conscious, alert, oriented to person-place-time.

#### Bone marrow aspirate:

After taking written consent, this BMA procedure was done at Kashyap ward of SSH BHU on 19/05/25. findings are:

**Cellularity-** insignificant, **erythroid series-** normoblastic maturation, **myeloid series-** no any blast cells, **megakaryocytes-** not seen. Bone marrow biopsy needed for final conclusion.

On basis of history, clinical findings (table-2, table-3) and laboratory investigations (table-4) the case is diagnosed IDA provisionally. After excluding all probable causes and performing related investigations to justify differential diagnoses (flowchart-2), it was concluded as a cause of severe graded IDA.

**RESULT:** It is shown in table-7, figure 1,2,3,4

- Patient, diagnosed as severe anaemia of iron deficiency, after taking medications for 8 days on IPD basis noticed improvement in both clinically and investigation.
- No any fresh complain developed in this time period like rashes, pain

abdomen, bleeding disorder, allergic reaction etc.

- No post treatment complication developed and more over quality of life improved in patient.
- After 8 days of IPD treatment, there was improvement in clinical as well as laboratory findings which is mentioned hereby (table-7).

**Table-1: Personal History:**

Title	Before disease manifestation	After disease manifestation
<b>Appetite</b>	Normal	Diminished
<b>Sleep</b>	Regular	Disturbed, irregular
<b>Urine</b>	Normal (6-8 times/day)	Normal (6-8 times/day)
<b>Stool</b>	Normal (yellowish, semisolid without foul smell and mucus)	Normal (yellowish, semisolid without foul smell and mucus)

**Table-2: General examinations:**

Title	Findings
General Condition	Fair
Sensorium	Conscious, well alert
Temperature	Afebrile (98.6 degree)
Pallor	+++
Icterus	Absent
Cyanosis	Absent
Clubbing	Absent
Oedema	Absent
Rashes	Absent, no any petechiae
Koilonychia (Spoon Shaped Nails)	+
Lips	No any cheilosis and angular stomatitis
Tongue	Coated

**Table-3: Systemic Examinations:**

System	Inspection	Palpation	percussion	Auscultation
<b>GI system</b>	No visible scar mark, No any superficial vein. shape flat, inverted umbilicus	<b>Superficial palpation:</b> No any rigidity or muscle guarding. No any rebound tenderness. <b>Deep palpation:</b> <b>Liver:</b> 5cm enlarged, smooth, soft, nontender, regular. <b>Spleen:</b> 4.5cm enlarged, hard, regular, nontender.	No any fluid thrill. No any shifting dullness. Dull note at right and left hypochondrium.	Normal bowel sound audible.

**Table-4: Investigations:** All the relevant laboratory parameters were conducted in SSH, BHU is mentioned herby

Parameters	13/05/25	17/05/25	20/05/25
<b>Complete blood count</b>	TLC-3600 DLC- N <sub>40</sub> L <sub>56</sub> M <sub>03</sub> E <sub>01</sub> B <sub>00</sub> Hb-5.1g/dl PLT-50000	TLC-4200 DLC- N <sub>35</sub> L <sub>60</sub> M <sub>03</sub> E <sub>02</sub> B <sub>00</sub> Hb-5.5g/dl PLT-93000	TLC-3370 DLC- N <sub>35</sub> L <sub>51</sub> M <sub>5.3</sub> E <sub>6.5</sub> B <sub>0.7</sub> Hb-6.3g/dl PLT-107000
<b>Recti count</b>	4%		
<b>Peripheral blood smear</b>	Hypochromic microcytic anaemia with severe thrombocytopaenia, mild leukopenia and relative lymphocytosis(pancytopenia)	RBC-mild anisocytosis, poikilocytosis with normocyte, microcyte, macrocyte, target cells, fragmented cells, elongated cells, tear drop cells. WBC- TLC within normal limit range. DLC -N <sub>54</sub> L <sub>40</sub> E <sub>03</sub> M <sub>3</sub> B <sub>0.3</sub> Platelet lower side of normal range.	Microcytic hypochromic with moderate thrombocytopenia and relative lymphocytosis
<b>Serum copper</b>		169.10 ug/dl	
<b>Serum IRON</b>	21.07 ug/dl		
<b>Serum TIBC</b>	UIBC- 610.93ug/dl TIBC- 632 ug/dl		
<b>Stool occult blood test</b>	Negative		
<b>Urine RM</b>	WNL		
<b>Serum folate</b>		14.1 ng/ml	
<b>Serum vitamin B 12</b>		305 pg/ml	
<b>USG whole abdomen</b>	Mild hepatosplenomegaly		

**Table-5: Therapeutic intervention and diet:**

From 13/05/25(day of admission) to 21/05/25(day of discharge): oral medications and diet are described here-

Day	Treatment	Diet
Day 1	<i>Mandura Bhasma</i> 200mg (after meal) BD with citrus fruit juice. Syrup <i>Rohitakarishtha</i> 5ml TID(after meal) Syrup multivitamin 5ml BD	Iron rich diet (organic vegetables, spinach, <i>Chana</i> , <i>Guda</i> , beans, citrus fruit, dates, nuts)
Day 2 to day 8	Same treatment	Same diet

**Table-6: Timeline:**

From the very onset of disease to getting discharge from SSH, BHU, all the events summarized below-

15/02/25	Child has complaint of fatiguability, reduced appetite, low grade fever on and off, pain in bilateral lower leg since last 2 weeks.
20/02/25-10/03/25	Child taken oral antibiotic (tab cefixime), oral antipyretic (syrup paracetamol and mefenamic acid), syrup multivitamin consulting with private doctor for 2 weeks but not got significant improvement .
11/03/25-30/03/25	Parent was worried and visited local govt hospital where injectable antibiotic, intravenous fluid given for 7 days without any primary investigation.
10/04/25-01/05/25	After not getting much relief in fever, pain in leg and diminished appetite, parent went to AIIMS, Patna, paediatric OPD on 10/04/25. After doing preliminary investigation, oral antibiotic, iron supplement, multivitamin given. Parent was told to admit the child for further investigation, procedure, management and diagnosis. Patient was admitted for 7 days where IV antibiotics, IV fluid and 2unit PRBC transfusion done and bone marrow aspirate was planned but attendant refused to do.
13/05/25	Child visited <i>Kaumarbhritya Balrog</i> OPD of SSH BHU on 13/05/25 without any improvement in fever, reduced appetite and pain in calf muscle. After detail history taking and clinical examination, it was decided for admission.
13/05/25-20/05/25	Child admitted in IPD of Kashyap ward for 8 days. in this period, <i>Mandura Bhasma</i> 200 mg twice a day, syrup <i>Rohitakarishtha</i> 5 ml thrice a day, syrup multivitamin 5ml twice a day given along with iron rich diet. All the investigation for diagnosis was done including bone marrow aspiration procedure was performed.
21/05/25-31/05/25	After discharge patient was under follow up for 11 days. Improvement in clinical symptoms as well as in laboratory findings noticed .

**Table-7: Result and improvement in clinical and lab reports before and after treatment**

Criteria/findings	Before admission	At 9 <sup>th</sup> day of discharge
Appetite	Poor, diminished	Increased oral intake
Pain in calf muscle	++	absent
Fever	Afebrile	Afebrile
Tachycardia/palpitation	++	No any audible murmur
Hepatomegaly	5 cm, nontender (figure-3)	2.5cm, nontender (figure-3)
Splenomegaly	4.5 cm, nontender (figure-4)	3.0cm, nontender (figure-4)
Pallor	+++	+
General weakness	Fatigue	Active, playful
Haemoglobin %	5.1g/dl (figure-1)	8.7g/dl (figure-2)

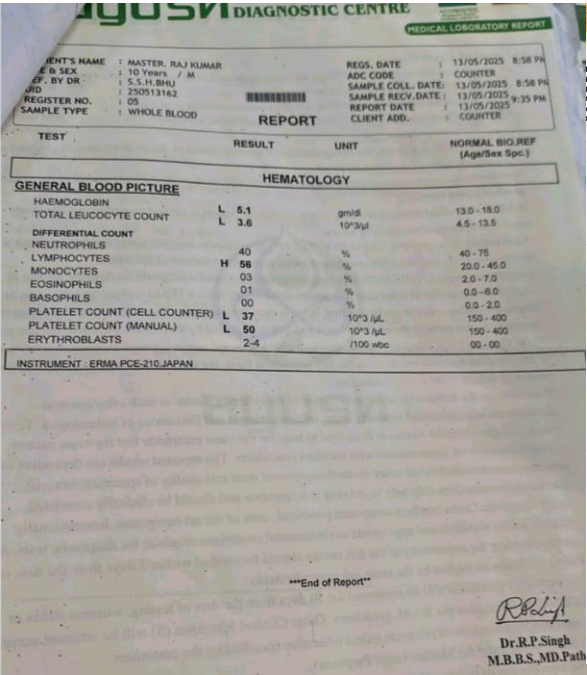


Figure-1: complete blood count findings before treatment

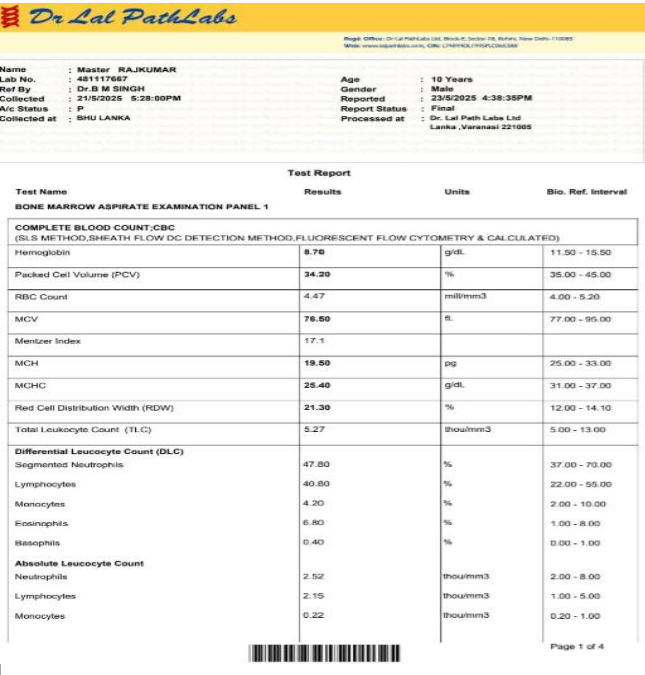


Figure-2: complete blood count findings after treatment

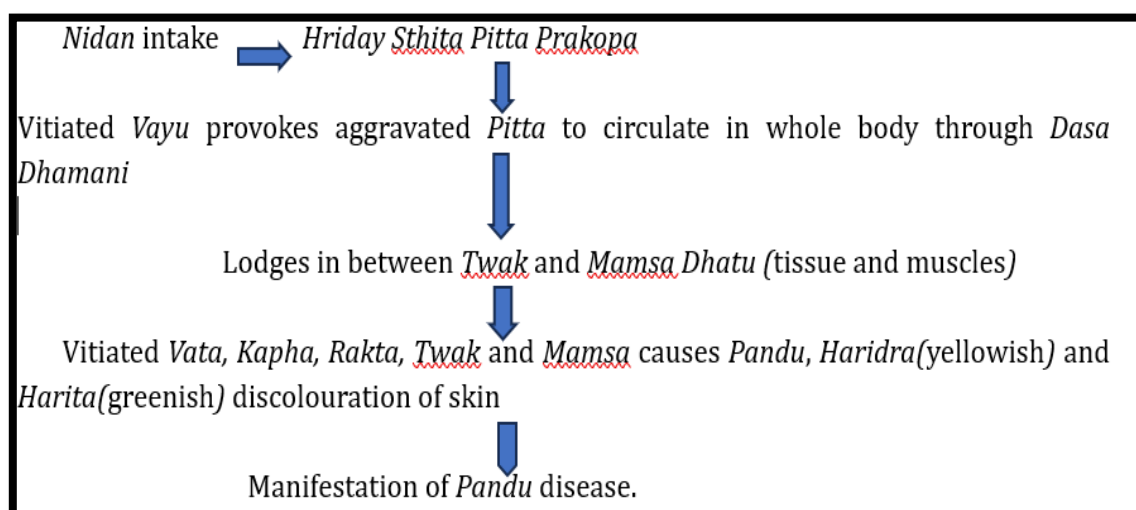


Figure-3: reduction in hepatomegaly after treatment

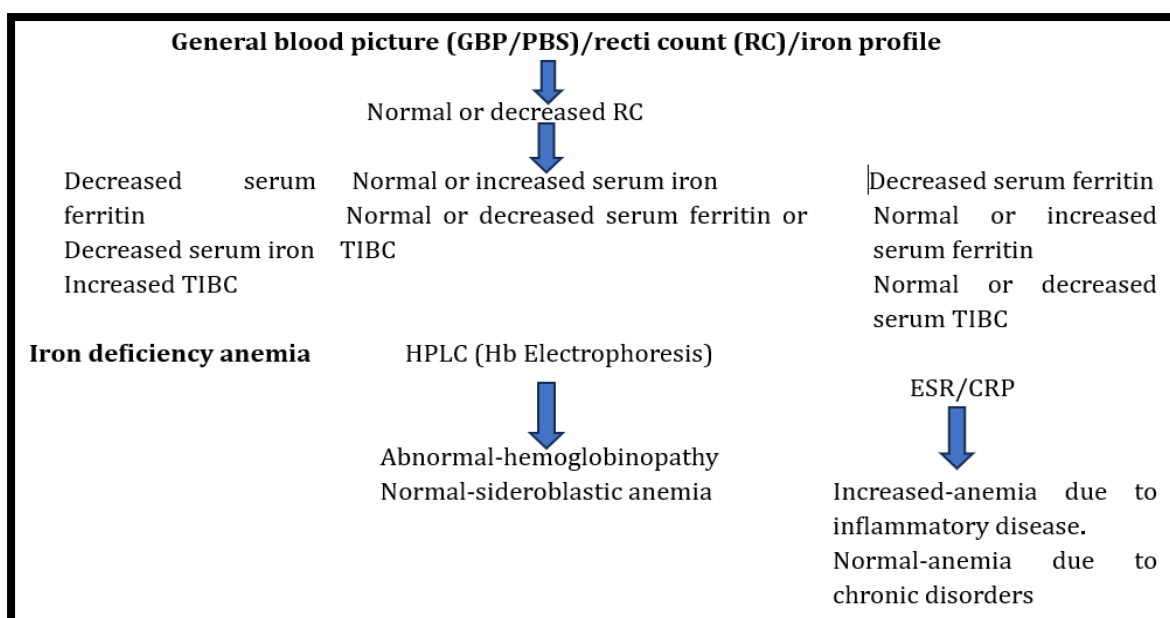


Figure-4: reduction in splenomegaly after treatment





Flowchart-1: *Pathogenesis of Pandu*



Flowchart-2: *Approach for diagnostic algorithm* <sup>[4]</sup>

## DISCUSSION:

Anaemia in childhood age group is very common entity now a days because of taking pica, injudicious use of cow milk beyond infantile age without introducing complimentary diet to child, malnutrition, behavioural disorder and many more. Frequent use of oral iron supplementation to cope up anaemia leads to develop GI disturbances in children. *Pandu* especially *Mrittika Bhakshanaja Pandu* which can be said

as anaemia due to pica or nonedible objects) is mentioned in our *Ayurveda* classics in details with proper pathogenesis, clinical features and management.

**Mandura** is mentioned in classics in various formulations like *Mandura Bataka*, *Punarnavadi Mandura*, *Navayas Lauha* etc for treating *Pandu*.<sup>[3]</sup> *Mandura Bhasma* mentioned specially in *Rasa Ratna Samucchay* (chapter 5 *Dhatu Vijnana*)<sup>[5]</sup> and *Rasa Tarangini* (chapter 21 *Lohavada*).<sup>[6]</sup>



### Pharmacological property of *Mandura Bhasma* :

<sup>[7]</sup> *Rasa*(taste)-*tikta*(bitter),*kashay*(astringent). *Guna*(properties)-*laghu*(light),*ruksha*(dry). *Virya* (potency) -*ushna* (hot). *Vipaka*(taste after digestion)-*katu*(pungent). *Doshakarmata*-*Raktavardhaka* (hematinics), *Yakritpleebahara* (destroyer of live and splenic disorder), *Pandughna* (improve anaemia), *Deepana*(appetizer). Active ingredients-Elemental iron ( $\text{Fe}^3+$  and  $\text{Fe}^{2+}$ ), Ferric oxide ( $\text{Fe}_2\text{O}_3$ ), Small amounts of trace minerals. *Mandura Bhasma* typically contains approximate 40–45% elemental iron (mostly present as iron oxides:  $\text{Fe}_2\text{O}_3$  /  $\text{Fe}_3\text{O}_4$ ) when prepared according to classical *Ayurvedic* methods <sup>[8]</sup> In vitro and in vivo study of *Mandura Bhasma* shows its efficacy in iron deficiency anaemia, <sup>[9]</sup> which is established by XRD, Scanning electron microscopy and Atomic Absorption Spectroscopy (AAS) study in various research study. <sup>[10]</sup> Significant reduction in the particle size to 200- 300 nm was observed in prepared *bhasma* which can absorb and assimilate in small intestine more easily. <sup>[11]</sup> *Mandura Bhasma* maintained normal villous structure and intestinal enzyme activity, suggest that it may serve as a safer and effective alternative hematinic, especially where gastrointestinal tolerance is a concern. <sup>[12]</sup>

*Rohitakarishtha*, another classical formulation mentioned in *Bhaisajya Ratnabali* (chapter 41-*Pleebhayakrt Rogadhikar*) also used in hepatosplenic disorder, jaundice etc. Main ingredient is *Rohitaka*. <sup>[13]</sup>

### Pharmacological property of *Rohitaka (Tecomella Undulata)*:

<sup>[13]</sup> *Rasa*(taste)-*Tikta*(bitter),*Kashaya*(astringent). *Guna*(properties)-*Laghu*(light),*Ruksha*(dry). *Virya*(potency)-

*Ushna*(hot),*Vipaka* (taste after digestion)-*pungent*). *Doshakarmata*-*Yakritpleebahara*(destroyer of live and splenic disorder),*Krimighna*(antimicrobial),*Deepana*(appetizer),*Shothahar*(decrease swelling). In vitro study shows the active ingredients like flavonoids, gallic acid, tecomalloside, beta sitosterol etc can effective in reducing inflammation, oxidative stress and hepatocyte dysfunction by reducing level of malondialdehyde. <sup>[14]</sup> *Rohitakarishtha* significantly mitigated elevated serum enzymes (AST, ALT, ALP), bilirubin, and histological liver damage-comparable to silymarin, the standard hepatoprotective agent in animal model. <sup>[15]</sup>

In Ayurveda classical references, *Chikitsa Sutra* (plan of management) of *Pandu* has been mentioned as *Mridu Panchakarma* like *Vamana* (emesis) and *Virechana* (purgation) with *Snigdha* and *Tikshna* drugs. *Acharya Charaka* mentioned various formulations for *Pandu* like *Navayas lauha*, *Punarnavadi Mandoor*, *Silajatu Vataka*, *Haridradi Ghrta*, *Vijakarishtha* and many more which are beneficial. In *Charaka Samhita*, *Mrittika bhakshanaja Pandu* and its management also explained as use of *Vyoshadya ghrta*, *Kesaradya ghrta*. To create aversion of PICA or habit of taking non edible objects, use of *Vidanga*, *Ela*, *Aivisa*, *Neem*, *Patha*, *Katurohini*, *Murva* herbs mixed with clay and given to child. In this case report, we significantly observed drastic improvement using *Mandura Bhasma* and *Rohitakarishtha* in severe IDA along with use of iron rich diet.

### CONCLUSION:

From this case study, it is concluded that severe IDA can be managed by classical *Ayurvedic* interventions like *Mandura Bhasma* and *Rohitakarishtha* in appropriate classical dosages along with proper diet without any noted adverse effects or complication. Though in modern medicine, oral iron

supplementation and blood transfusion remains only way of treatment, but it can be managed by *Ayurvedic* intervention keeping mind the economic burden.

#### **Consent of patient:**

Written informed consent of the patient has been taken for publication and procedure without exposing identity of the patient.

#### **Ethical approval:**

The study is carried out as per international conference of harmonization- good clinical practice guidelines.

#### **Author contribution:**

S. Sarkar designed this study with case execution, designing, analysing and writing. A bharti performed the data collection and framing, S Gupta edited the manuscript .S Sarkar finally verified this. T. Biswas had finalized the editing and justified the article. All authors critically revised the manuscript for important intellectual content and approved the final version for submission with no assistance from AI was utilized in the drafting of this manuscript.

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