Navayas Lauh; Justification to use as Primary medicine for treating Anaemia; Under “Anaemia control Programme through Ayurveda”

Authors

Thakur Sudarshan K.¹, Tak Anjna², Bajaj Nisha³

¹M.D. Ras Shastra Avum Bhaishajya Kalpna, Lecturer, Ras Shastra Avum Bhaishajya Kalpna, R.G.G.P.G Ayurvedic College, Paprola, Kangra, H.P.

²M.D. Prasuti Tantra Avum Stri Roga, Associate Professor of Prasuti Tantra Avum Stri Roga, Abhilashi Ayurvedic College and Research Institute, Mandi, H.P.

³MD Scholar, Ras Shastra & Bhaishajya Kalpana, R.G.G.P.G Ayurvedic College, Paprola, Kangra, H.P.

Corresponding Author: - Thakur Sudarshan K.

ABSTRACT

Navayas Lauh is a well known Ayurvedic iron containing pharmaceutical preparation. It is very commonly used formulation in Ayurveda for Anaemia besides some other diseases. Classical texts describe various aspects from preparation to clinical uses of Navayas lauh. Further Pandu Rog or Anaemia is very common clinical condition existing individually as result of malnutrition or secondary to various other conditions or diseases. The malnutrition is such a serious cause behind anaemia prevalence, that even with extensive drive we are still far behind to control anaemia, especially in India. In this regard many modifications of programme protocol and with changes in medicine like addition of folic acid with Iron Sulphate, fortification of food material with Iron etc. has been done. In this process of development and with an eager expectation from Ayurveda system of medicine, some states like Himachal Pradesh are planning to introduce Ayurveda medicines and line of treatment to combat Anaemia and have better results in anaemia control Programme through Ayurveda.

Key words: - Navayas Lauh, Lauh, Pandu roga, Anaemia, Ayurveda, Anaemia control Programme, Anaemia control Programme through Ayurveda.

INTRODUCTION

The use of Navayas lah is very much justified as per classical Ayurveda references point of view. Looking at the etiological factors of anaemia (Pandu Rog) & following the principle of “Nidaan Parivarjana” for treatment, the composition of Navayas Lauh is an excellent formulation. It contains Iron Supplement, it has constituents to create best media for iron absorption, it has depana-Pachana drugs in it and it contain anti-parasitic drug. But to use this formulation with confidence, first we have to get the answers of some questions about Navayas Lauh and Anaemia. Also we need to understand how and why this formulation has been designed. What is the main constituent of Navayas Lauh & Why? Main constituent of Navayas Lauh seems to be Lauh Bhasma (Iron) as we think keeping in view the theory that haemoglobin is constituent of Blood and its having Iron in its structure. But we also see, many formulations in Pandu rog chikitsa without Iron containing material like Bhasma of Lauh or (like; Mandoor and Kasees). Why a lot of Ghrita formulations in Pandu Rog chikitsa? Was this Haemoglobin like theory known to our Acharyas those...
composed these formulations with addition of Lauh? If Yes! Why this theory not described in Pandu rog samprapti in classical texts? And If No! Then how they got this idea to add Iron (Lauh Bhasma) in such formulations? What are other common conditions or diseases where Navayas Lauh is used frequently? Are these ayurveda medicines really effective in Pandu roga (anaemia). Is Navayas Lauh; the right formulation for anaemia control programme? How to get best results from navayas Lauh in anaemia control? This article is primarily focused to have the answer of these questions. The article will be focused on the pharmaceutical preparation of Navayas Lauh & Lauh Bhasma from the Ras Shastra and Bhaishajya Kalpana point of view to understand its clinical use in a better way and further classical and some information about amemia (Pandu Rog).

Table 1: Navayas Lauh Composition:

<table>
<thead>
<tr>
<th>Sr.No.</th>
<th>Name</th>
<th>Botanical Name</th>
<th>Part Used</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Shunthi</td>
<td>Zingiber officinale</td>
<td>Rhizome</td>
<td>1 Part</td>
</tr>
<tr>
<td>2.</td>
<td>Marich</td>
<td>Piper nigrum</td>
<td>Fruit</td>
<td>1 Part</td>
</tr>
<tr>
<td>3.</td>
<td>Pipali</td>
<td>Piper longum</td>
<td>Fruit</td>
<td>1 Part</td>
</tr>
<tr>
<td>4.</td>
<td>Haritaki</td>
<td>Terminalia chebula</td>
<td>Fruit Pericarp</td>
<td>1 Part</td>
</tr>
<tr>
<td>5.</td>
<td>Baheda</td>
<td>Terminalia bellirica</td>
<td>Fruit Pericarp</td>
<td>1 Part</td>
</tr>
<tr>
<td>6.</td>
<td>Amla</td>
<td>Emblica officinalis</td>
<td>Fruit Pericarp</td>
<td>1 Part</td>
</tr>
<tr>
<td>7.</td>
<td>Nagarmotha</td>
<td>Cyperus rotundus</td>
<td>Rhizome</td>
<td>1 Part</td>
</tr>
<tr>
<td>8.</td>
<td>Vayvidang</td>
<td>Embelia ribes</td>
<td>Fruit</td>
<td>1 Part</td>
</tr>
<tr>
<td>9.</td>
<td>Chitrak</td>
<td>Plumbago zeylanica</td>
<td>Root</td>
<td>1 Part</td>
</tr>
<tr>
<td>10.</td>
<td>Lauh</td>
<td>Iron</td>
<td>Bhasma (30 Putti, API)</td>
<td>9 Part</td>
</tr>
</tbody>
</table>

-Navayas Lauh Pharmaceutical Preparation: -

It contains Lauh Bhasma and any formulation prepared with Lauh Bhasma requires following pharmaceutical processing of Lauh i.e.
1. Shodhan &
2. Marana (Bhasmikaran).

Shodhana of Lauh:

Purpose of Shodhan: - Shodhan is done to make the Lauh free from dosha and to make it usable for further process of Marana.

Process Used: - Nirvapa process (Quenching in a liquid) is done.
- **Table-2: Shodhana of Lauh:**

<table>
<thead>
<tr>
<th>Media Used for Shodhana</th>
<th>Image-1: Flow Chart-1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tila Taila (sesame oil)</td>
<td>Raw Kant Lauh</td>
</tr>
<tr>
<td>Takra (butter milk)</td>
<td>Heating Process</td>
</tr>
<tr>
<td>Gomutra (cow’s urine)</td>
<td>Hot Raw Kant Lauh</td>
</tr>
<tr>
<td>Arnal/Kanji (sour gruel)</td>
<td>Shudha Lauh; ...</td>
</tr>
<tr>
<td>Kultha Kwath</td>
<td>Nirvana (Quenching in media)</td>
</tr>
<tr>
<td>(decoction of <em>Dolichos biflorus</em>)</td>
<td>(After completion of all steps of Samanaaya Shodhan)</td>
</tr>
</tbody>
</table>

Table -3; *Marana of Lauh*: - Flow Chart Image-2,3,4

**MARANA OF LAUH:**

Most commonly used liquid media for Marana
1. Triphala Kwatha/Gomutra
Or Triphala kwath prepared in gomutra.

→ 2. Bhavana.

→ 3. Putta (Heat Process)

Usually, Gajapata is used as heating grade to prepare Lauha Bhasma

**PROCESS OF PUTTA; LAUH MARANA:**

- Preparation of Chakrika
- Chakrika in Earthen plates
- Kapadmitti
- E. Plates

- Lah Material after Putta
- Earthen plates out of Putta
- Putta

**LAUH MARANA**

- Chakrika after Putta
- Chakrika after several (30) Putta
- Sifting
- Lah Bhasma after several (30) Putta
Other Laboratory Analysis of \textit{Lauh Bhasma}: -

Tests with special reference to \textit{Lauh Bhasma} (Mineral origin Content) analysis (Sophisticated Tests): -

Chemical Characterization of Bhasma/Material.

- EDAX (Energy dispersive Analysis of X-Ray- a Spectroscopy technique for elemental analysis)
- XRD (X-Ray Diffraction) (for crystal structural interpretation & Molecule interpretation).
- Particle size analysis
- Tests for Heavy Metals; Hg, Cd, Pb, As up to permissible limit (Gravitational Methods or sophisticated spectroscopy like ICP MS.
- FTIR (Fourier Transform Infrared Spectroscopy)

\textbf{NAVAYAS LAUHA ; METHOD OF PREPARATION:}

Raw Material; Procured, Verified & Tested. Take all ingredients of pharmacopoeial quality. Wash, dry and powder ingredients 1 to 9 individually in a pulverizer (or Imam Dasta) and pass through sieve number 85. Weigh separately each powdered ingredient (Table 2), mix together in specified ratio along with Ayoraja (lauha bhasma) and pass through sieve number 44 to obtain a homogeneous blend. Store in a cool place air-tight containers, protected from light and moisture.
This powder form so recovered may be made into tablets by Triturating with Gomutra and rolling in pills or further; it may be made into any suitable formulation types; (Powder, Tablet, Capsule, Syrups, Granules, Avaleha after adopting proper product development protocol).

LABORATORY ANALYSIS: -
PLIM Guidelines & Standards as per Ayurvedic Pharmacopeia of India:

Description: Reddish-brown powder with pungent odour and spicy, pungent taste. All pass through sieve number 44 and not less than 50 per cent pass through sieve number 85.

Identification: Microscopy:
Physico-chemical Parameters: (API Protocol & Appendices)
- Loss on drying at 105°C: Not more than 6 per cent,
- Total ash: Not more than 56 per cent,
- Acid-insoluble ash: Not more than 14 per cent,
- Alcohol-soluble extractive: Not less than 11 per cent,
Water-soluble extractive: Not less than 12 per cent, pH (10% aqueous solution): 3 to 4.

Assay: - Iron: Not less than 33 per cent,

Other requirements: - Microbial limit: Aflatoxins

Chromatographic methods; - Thin Layer Chromatography: It shows major spots at Rf 0.26, 0.31, 0.43 (all blue) and 0.91 (fluorescent blue)\textsuperscript{14}.

**Other Advanced & Sophisticated Tests:**

HPLC, HPTLC (Herbal Material fingerprinting with Quantitative Analysis of Herbal material with markers),

Tests with special reference to *Lauh Bhasma* (Mineral origin Content) analysis (Sophisticated Tests):

- Chemical Characterization of Bhasma/Material.
  - EDAX (Energy dispersive Analysis of X-Ray- a Spectroscopy technique for elemental analysis)
  - XRD X-Ray Diffraction (for crystal structural interpretation & Molecule interpretation).
  - Particle size analysis
  - Tests for Heavy Metals; Hg, Cd, Pb, As up to permissible limit (Gravitational Methods or sophisticated spectroscopy like ICP MS.
  - FTIR (Fourier Transform Infrared Spectroscopy)

**ANAEMIA:**

Anaemia is a condition in which the number of red blood cells or their oxygen-carrying capacity is insufficient to meet physiologic needs, which vary by age, sex, altitude, smoking, and pregnancy status\textsuperscript{6}. In its broadest sense, anemia is a functional inability of the blood to supply the tissue with adequate O2 for proper metabolic function. Anemia is not a disease, but rather the expression of an underlying disorder or disease. Various diseases and disorders are associated with decreased hemoglobin levels. These include\textsuperscript{6}:

- Nutritional deficiencies;
- Iron deficiency is thought to be the most common cause of anaemia globally, although other conditions, such as folate, vitamin B12 and vitamin A deficiencies, chronic inflammation, parasitic infections, and inherited disorders can all cause anaemia\textsuperscript{6}.
- External or internal blood loss
- Increased destruction of RBCs
- Ineffective or decreased production of RBCs
- Abnormal hemoglobin synthesis
- Bone marrow suppression by toxins, chemicals, or radiation
- Infection
- Bone marrow replacement by malignant cells

**Diagnosis of anemia\textsuperscript{6}**

1. Patient history
2. Patient physical exam
3. Signs and symptoms exhibited by the patient
4. Hematologic lab findings
   - Identification of the cause of anemia is important so that appropriate therapy is used to treat the anemia.

1. Patient history\textsuperscript{8}
   - Dietary habits
   - Medication
• Possible exposure to chemicals and/or toxins
• Description and duration of symptoms
• Tiredness
• Muscle fatigue and weakness
• Headache and vertigo (dizziness)
• Dyspnia (difficult or labored breathing) from exertion
• GI problems
• Overt signs of blood loss such as hematuria (blood in urine) or black stools

Patient Physical examination:
• Specific findings may help to establish the underlying cause:
  1. In vitamin B12 deficiency there may be signs of malnutrition and neurological changes.
  2. In iron deficiency there may be severe pallor, a smooth tongue, and esophageal webs.
  3. In hemolytic anemias there may be jaundice due to the increased levels of bilirubin from increased RBC destruction.
• General findings might include
  • Hepato or splenomegaly
  • Heart abnormalities
  • Skin pallor
• Lab investigation. A complete blood count, CBC, are required to reach the diagnosis:

Anaemia Prevalence:
The most recent estimates for 2016 indicate that anaemia affects 33% of women of reproductive age globally. Children under 5 years of age in the WHO African Region represented the highest proportion of individuals affected with anaemia (62.3%).

Infant and young child with breastfeeding and complementary feeding:
Children under 2 years of age are one of groups that are most vulnerable to iron deficiency. Thus, appropriate feeding practices – including exclusive breastfeeding for the first 6 months of life, and optimal complementary feeding – during the first 2 years of life are crucial for avoiding the development of iron deficiency, anaemia, micronutrient deficiencies and other forms of under nutrition.

Infants with Breastfeeding:
Normal-birth-weight: Normal-birth-weight (>2500 g), full-term (37 weeks’ gestation or more) infants are generally born with iron stores that are adequate for approximately the first 4–6 months of life.

Low-birth-weight infants and premature infants:
In contrast, low-birth-weight infants and premature infants will have compromised iron stores at birth, owing to their reduced size and/or premature delivery. It is recommended that these infants receive an external source of iron (e.g. iron supplements) before 6 months of age.

Table -5: Elderly Anaemia

<table>
<thead>
<tr>
<th>Cases</th>
<th>Type of Anaemia</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/3</td>
<td>Nutritional deficiencies, primarily iron (but also folate and vitamin B12)</td>
</tr>
<tr>
<td>1/3</td>
<td>Chronic inflammation or chronic kidney disease</td>
</tr>
<tr>
<td>1/3</td>
<td>“Unexplained anaemia of the elderly”</td>
</tr>
</tbody>
</table>

About 42% of anaemia in children would be amenable to iron supplementation and about 50% of anaemia in women could be eliminated by iron supplementation.
Also in elderly 1/3 of total anemia of Nutritional deficiencies, primarily iron (but also folate and vitamin B12) and another 1/3 of total that is “Unexplained anaemia of the elderly” so around 67 % of anaemia in elderly is expected to respond excellently with iron supplement\(^{18}\).

So considering this fact, the Navayas Lauh being an iron source is justified and other constituents of Navayas Lauh may help counter other factors such as folate, vitamin B12 and vitamin A deficiencies, chronic inflammation, parasitic infections GIT disturbance etc.

**Samprapti (pathogenesis from Ayurveda Point of view) (Pandu Rog):**

**Table-6 Flow Chart-5 :**

<table>
<thead>
<tr>
<th>SAMPRAPTI OF PANDU ROG AS EXPLAINED IN CHARAK CHIKITSA STHAN(^{5})</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>SAMPRAPTI PANDU/PATHOGENESIS OF ANAEMIA</strong></td>
</tr>
<tr>
<td>हृद्यसंधानं रीढ़ितं स्वेदाभव्यं, श्रम (पूर्वस्क)</td>
</tr>
<tr>
<td>दोषा: पित्तस्वास्तस्तु (P+)</td>
</tr>
<tr>
<td>कुप्पितत् धातुरु</td>
</tr>
<tr>
<td>शैलिक्षणम् तन्त्र धातुसङ्कर्मोऽगीरिम् चोपजाक्ते</td>
</tr>
<tr>
<td>दोषनुसार पद्धतिः</td>
</tr>
<tr>
<td>वर्ण बस स्नेह अजु - क्रम</td>
</tr>
<tr>
<td>अतः: अष्ट- रक्त, मेन, निसार, शिशिलिन्द्रियं, वक्तुर्यं (Ch.chi. Pandu16/4-6)</td>
</tr>
</tbody>
</table>

| SAMPRAPTI PANDU/PATHOGENESIS OF ANAEMIA |
| कहस, अमल, लवण, स्त्यंत उशान, विरुद्ध अन्न, अवसान्य अतर, विदाग्ध अतर, पिनयक (अलली), दिवसव, प्राकरण-रीढ़ित |
| वानिशाम्या, वेगविद्यर्ह, शानमा, चिंता, बिया, क्रोहि, शीखो-तेत्रितम् |
| उद्धवसे प्रेरित, दशकान्तिनीयों चवार |
| प्रपुस्तराने देहम, त्वाचा मानसंतारमास भृतराम (पूर्वस्क: रीढ़ित, तेत्रितम) |
| कप, वास्त, राक्त, त्वाचा & मानस धातु दृशु (पूर्वस्क : श्रम) |
| पानु, हरिद्र, हरिता, वानमभुविद्रामत्राची |

| LAKSHAN PANDU\(^{5}\): |
| - Karan-kshwed, |
| - mandagani, daurbalya, shram, shwas, Bharam, |
| - Gaurav, Aruchi, nidralu, shathivan, alpavaak, shishirdveshi, |
| - Gaatra piditomathite-eev, shoonakshikut, shirnaloma, |
| - Pindikodveshan-kati-Uru-pada vedana, Shool, |
| - Jwar, |

**Understanding Pandu Rog (Anaemia) Treatment: -**

**Chikitsa Sutra Pandu :**

"Tatra pandvamayi sanigdhas-tikshannair-urdhav-anulomikai- sanshodhayo"\(^{21}\)

- Sanigdha-Tikshan – Shodhan (Urdhav-anulomike)

Sharangdhara has contraindicated Vaman in Pandu rog\(^{Sha. U.3/8}\).

Later Charak while describing treatment of pandu said;

- Snehairebhurupkramya –sanigdham-matva- virechyet"\(^{21}\); That is;

- After proper snehana do Virechan karama (here vaman not indicated).

Further after; Koshatha shudhi –
“Pathaya-annani” i.e.

- Pooraan - Shali, Yav, Godhoom
- Yoosh – Mudga, arhar, Masoor
- Maans Ras – Jangal
- Bhaishajya- Yatha Dosh

Table -7; Flow Chart-6; Chikitsa Sutra Pandu :

| Snehana-shodhan(Vamman Virechana)-PathayAnna-Shaman-(Tikta, Sheeta, Snigdha, deepana, pachana, balya, raktavardhak, rasayan). |

The primary treatment for any disease is generally, shodhan after desired poorva karma and shodhana karma is followed by shaman chikitsa. Here in PANDU roga, “Haridya sthita Sadhak pitta udirnam” is primary cause. This precipitate hridya spandana initially and in long term Hrid rog. Here in pandu-sadak pitta, Nidana Parivarjan is advised & Snehana is done. (without or mild svedana only, as there is Pitta prakop). (In pandu rog chikitsa there are many types of ghrita indicated for snehan and ghrita is also paramauashadh for pitta). Virechan is primary shodhana technique here for saadak pitta shaman. As it is at kapha sthan (hridya-urdha vjatragata) so Vaman may first be done but not in krish Pandu rogi (Sharangdhar contraindication). Further, After sansarjan karma and with Pathaya-anna the shaman chikitsa is done. If we see w.s.r. to Navayas Lauh in Pandu Rog chikitsa; it is Pandu, Hridrog, Kushata, Arsh, Kamla Har. In Navayas Lauh all contents; Triphala, Trikatu, Trimad & Lauh all are Deepana & Pachana. Triphala is saarak, Kapha- Pitta Shamak also Rasayana. Lauh Bhasma has many properties Tikta, Sheeta Snigdha and Pandu, Hridrog, Kushata, Arsh, Kamla har\textsuperscript{13}, also Kantivardhak, tridoshshamak, shreshtha rasayana, pliha, agramandayahar\textsuperscript{13} thereby giving same properties To Navayas Lauh. Due to its Tridoshashamak and especially Sheet character, it is Primarily saadak pitta shaman here in pandu like condition, it is snigdha so varnya, tvachaya, Kantikar, balya, dhatu poshak & Ojovardhak. Sheeta and tikta guna of Lauh Bhasma and so Navayas Lauh make it more specific for pittaj Pandu roga (Paitike Tiktasheetalam\textsuperscript{17}) & pittaj Pandu roga is most commonly expected due to samanya dosh sidhanta. For more than one dosha prakopa involving PANDU rog, the line of treatment varies like pandu with kamla or other conditions. Then other formulations can be used for better results like Punarnava Mandoor in Shoth yukta pandu, Darvyyadi lauh (leham) for yakritapaliha involvement. In more complicated Pandu, yograj, svarnmakshikadi yog and Shilajitvadi vatak may be used. If there is vrika roga, sarvatobhadra vati with punarnava and makoya svaras may be given. Although for better results from Navayas lauh, its annupana should strictly be followed and other formulations may be added like Lohasava or Dhatryarishata.

Table-Flow Chart- Chikitsa Sutra of Pandu & Samprapti Vighatana: -

| The primary treatment for any disease is generally, shodhan after desired poorva karma and shodhana karma is followed by shaman chikitsa. |
| Here in Pandu roga, Haridya sthita Sadhak pitta udirnam is primary cause |
| This precipitate hridya spandana initially and in long term Hrid rog |
| Here in pandu for sadak pitta, & Nidana Parivarjan is advised & |
Snehana is done, (without or mild svedana only, as there is Pitta prakop).
(In pandu rog chikitsa there are many types of ghrita indicated for snehan and ghrita is also paramaushadh for pitta.

Virechan is primary shodhana technique here for Saadak Pitta.
As it is at kapha sthan (hridya-urdhvatragata) so Vaman may first be done but not in krish Pandu rogi (Sharangdhar contraindication).

Further, After sansarjan karma and with Pathaya-anna shaman chikitsa is done.

If we see w.s.r. to Navayas Lauh in Pandu Rog chikitsa;
(it is Pandu, Hridrog, Kushata, Arsh, Kamla Har).
as all contents (Triphala, Trikatu, Trimad & Lauh all are Deepana & Pachana)

Triphala is sarak, Kapha- Pitta Shamak also Rasayana.

Lauh Bhasma has many properties Tikta, Sheeta, Snigdha

Pandu, Hridrog, Kushata, Arsh, Kamla har¹³, is Kantivardhak, tridoshshamak, shreshtha rasayana, pliha, agnimandyahar¹³ thereby giving same properties Navayas Lauh

Due to its Tridoshashamak especially Sheet character, it is Primarily sadak pitta shamak here in pandu like condition
it is snigdha so varnya, tvachaya, Kantikar, balya, dhatu poshak & Ojovardhak

Sheeta and tikta guna of Lauh Bhasma and so Navayas Lauh make it more specific for pittaj Pandu roga (Paitike Tiktasheetalam¹⁷) & pittaj Pandu roga is most commonly expected due to samanya dosh sidhanta.

For more than one dosh prakopa involving Pandu rog, the line of treatment varies like pandu with kamla or other conditions

Then other formulations can be used for better results like Punarnava Mandoor in Shoth yukta pandu, Darvyadi loah (leham) for yakrita, Paliha involvement. In more complicated Pandu, yograj, svarnmakshikadi yog and Shilajtvadi vatak may be used. If there is vrika roga, sarvatobhadra vati with punarnava and makoya svaras may be used.

Although for better results from Navayas lauh, its annupana should strictly be followed and other formulations may be added like Lohasava or Dhatryarishata.

Modern Literature favouring Use of Navayas Lauh :-

1. WHO and National anaemia control programmers are primarily focused on iron supplements for anaemia control. Navayas Lauh also has a good Iron supplementation.

   About 42% of anaemia in children would be amenable to iron supplementation and about 50% of anaemia in women could be eliminated by iron supplementation¹⁸.

   Also in elderly 1/3 of total anemia of Nutritional deficiencies, primarily iron (but also folate and vitamin B12) and another 1/3 of total that is “Unexplained anaemia of the elderly”, so around 67% of anaemia in elderly is expected to respond excellently with iron supplement.
So considering Navayas Lauh an iron source is justified and other constituents of Navayas Lauh may help counter other factors such as folate, vitamin B12 and vitamin A deficiencies, chronic inflammation, parasitic infections GIT disturbance etc.

Triphala create a very good environment for iron absorption due to rich ascorbic acid⁹ gallic acid (GA), ellagic acid (EA) and chebulinic acid (CI) content¹⁰ as “enhancers” such as the organic acids citric, malic or ascorbic acid (i.e. vitamin C) may improve the absorption of iron Trikatu is bioavailability¹¹, vayavidang and Musta are anthelmintic & Vermifug¹²

**Navayas Lauh Therapeutic uses:**
Dose:- 2 g daily in divided doses¹⁴/1-3 ratti¹⁵/1-1 masha subah-Sham¹⁸/250 mg¹⁹.
Anupana: - Honey, Water¹⁴/MadhuSarpi¹⁶ Roganisar¹⁵/Ghrita, honey, Gomutra, Chhachh¹⁸/Madhu-Ghrita¹⁹

**TOOLS FOR EFFECTIVE PREVENTION AND CONTROL OF ANAEMIA:**
The main nutrients of concern for nutritional anaemia are iron, vitamin A, vitamin B12 and folate, increasing the intake of foods that are rich in these nutrients will help to meet nutrient requirements and thus prevent anaemia.

*Dietary diversification through increasing consumption of vegetables, fruits and animal-source foods, and accompanying strategies to improve the bioavailability of nutrients in the diet, should always be part of strategies to prevent anaemia*²², (diet and pathya-anna¹⁷ in Ayurveda).

Meat, fish and poultry are rich sources of bio-available iron. Plant sources of iron are generally less well absorbed, though including “enhancers” such as the organic acids citric, malic or ascorbic acid (i.e. vitamin C) (Amla, Triphala, etc) may improve the absorption of iron from these foods.²⁰

Avoiding combination of known inhibitors of non-haem iron – such as tea or coffee – with meals will improve iron absorptio²⁰.

A combination of strategies – increasing iron-rich foods in the diet, adding “enhancers”, avoiding “inhibitors” and exploiting beneficial processing techniques – will be the best approach for improving iron status²⁰.

Vitamin B12 is only found in animal-source foods; shellfish, beef liver, other meats, fish and poultry, as well as dairy products are rich sources of this vitamin, advise this diet²⁰. So anupana sarpi can help more than just as vehicle.

Folate is naturally found in legumes and green leafy vegetables, whole grains and fruits and fruit juices such as oranges²⁰, So honey, amla juice, oranges in diet and anupana is beneficial.

Fortification of food staples (e.g. wheat or corn flour, rice, salt) with one or several nutrients is a common approach, referred to as “mass” or “universal fortification”²⁰ is advisable.

*Methods of food processing – such as soaking (Bhawana dravya), fermentation (like lohasav & Dhatreyarishata) , germination (sprouting) or thermal (Paak & Putta etc.) or mechanical processing (Bhawana) – can also improve the bioavailability and absorption of iron*²⁰. So, use of Navayas lauh with gomutra or amla svaras bhawana may help a lot.

And also, start of treatment following proper protocol, Complete examination of Patient, not to hesitate to examine and investigate the patient completely before starting treatment, accurate diagnosis very important (Till then Treatment not to start) Nidana Parivarjana, Secondary Cause treatment if any (worm infestation, Malnutrition, any bleeding, etc), Any serious secondary Cause (like CRF etc.) to manage wisely, good documentation, consoling & motivation of patient, ensure follow up, reporting Success and also failure if any how encountered, any adverse event or associated positive finding, Publication and information sharing will add greatly to the results.
REFERENCES:

2. Sankhayan J.R., Bajaj Nisha, Navayas lauh & Pandu, PG research work documentation progress report; Jan. 2018
3. Thakur Sudarshan K. PPT, Navayas Lahu; “Anaemia control Programme through Ayurveda” Jan. 2018
15. Ras Tantra Saar & Sidha Prayog Sangra, Part 1, Krishna Gopal Ayurveda Bhawan, Kaleda, Pg 418
22. WHO GUIDELINE: USE OF MULTIPLE MICRONUTRIENT POWDERS FOR POINT-OF-USE FORTIFICATION OF FOODS CONSUMED BY INFANTS AND YOUNG CHILDREN AGED 6–23 MONTHS AND CHILDREN AGED 2–12 YEARS