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MANAGEMENT OF *PANDU* THROUGH *AAHAR* W.S.R TO *RASAVAHA SROTAS*

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ABSTRACT

Desire of life is the most important one to lead qualitative life. To fulfil this desire a healthy diet and regimen or lifestyle should be followed. Wholesome (*Pathya*) and unwholesome (*Apathya*) diet plays an important role to maintain health of healthy individual as well in treatment field to get relief from the diseased state. *Ayurveda* emphasizes upon the concept of *Pathya-apathya* along with medicine to complete the treatment procedure. *Panduroga* (anaemia) is a clinical condition represented with the reduction of haemoglobin concentration of blood according to the age, sex, and physiological condition of an individual. In developing countries, it becomes a global problem. In India more than 50% among the vulnerable groups such as pregnant women, infants, young children and adolescents are suffering from anaemia. Considering *pandu roga* as the *rasapradoshaja vikar* which possess the symptoms of *rasavaha* srotodushti such as Anorexia, Heaviness, Drowsines, etc hereby trying to draw the concept of *Pathya* in relation to *Pandu* (haemoglobin level- below the 10gm/dl and above 7gm/dl, through diet and regimen) which may helpful to eradicate prevalence of IDA.

KEYWORDS: *Pathya, Apathya*, Anaemia, *Panduroga, Rasavaha srotodushti*.

INTRODUCTION

Ayurveda is the ancient science of life which focuses on the maintenance of good health in healthy and eradication of ailments in diseased through its holistic approach, lifestyle modifications, dietary habits, and safer medications. *Acharyas* have described the concept of *Ahara* as proper and balanced diet which helps in achievement of physical and mental wellbeing. *Ahara ras* is the *Saara bhag* i.e. pure and nutritrious part of digested food. From *Ahara ras* the first *dhatu* known as *ras dhatu* gets formed in *rasavaha srotas* where *dhatvagni* of *rasa dhatu* plays the vital role. *Preenana* and *rakt poshan* are the main functions performed by *rasa dhatu*. The tissues plasma and blood present in the human body are respectively correlated with *ras* and *rakt dhatu* where *ras dhatu* circulates the essential nutrients in whole body through *rasavaha srotas* and *rakt dhatu* being the haemoglobin part of blood supplies oxygen throughout the cells by *rasavaha* and *raktvaha srotas* too.[1]

Manufacture of new tissues and proper flow of nutrients and waste materials is provided by the healthy and unobstructed *srotases*. Impaired functions of *Srotas* leads to stagnation in proper functioning of *Doshas, Dhatus* and *Malas* in the *Srotases* of the respective *Dhatus*. Hence, improper intake of *Ahara* leads to the *Rasavaha Sroto Dushti* and this result in the formation of *'Panduroga'*. The word *Pandu* indicates altered skin color which is developed due to *dhatukshaya* and *avarana*. *Agni* and *Avarana*, plays a major role for the improper formation of *Dhatu* or catabolic changes in body tissues where the impaired iron absorption is occurred due to *Avarana*. *Acharyas* has mentioned *Panduroga* under the *Santarapanaja* (overnutrition) and *Apatarpanaja* (undernutrition) *vyadhis* in different *Samhita*. *Pandu roga* is generally correlated with anaemia. The amount of iron obtain from diet should be sufficient to replace the normal loses through sweat, urine and stool. Impaired brain function, GIT function, altered hormone production and metabolism are caused due to anaemia or *Pandu*. Percentage of anaemia is growing even in developing countries because of the over consumption of adulterated and non-nutritious food mainly. *Pathya* or wholesome diet is defined as a basic necessity to sustain the life in relation to body and mind of an individual without causing any adverse effects and plays a major role in prevention of diseases. Considering this *ayurveda* has explained the detail typewise dietary management of *pandu roga*.[2]

AIM: To emphasize the dietary management of *pandu roga*.

OBJECTIVE

1) To study the concept of *pandu roga*.

2) To study the relation of *rasavaha srotas* in *pandu roga*.

MATERIALS AND METHODS

Material has been collected from ancient Ayurvedic texts, Research Journals, and electronic databases.

REVIEW OF LITERATURE

VYUTPATTI

The word *Pandu* is derived from *'Padi Nashane' Dhatu* by adding *'Ku' Pratyaya* to it, the meaning of which is always taken in the sense of *Nashana* and as *Pandu* has been kept under the group which is classified and named according to the change in colour.

NIRUKTI OF *PANDU*

1. According to *Shabdarnava Kosh 'Pandustu Peet bhagardh Ketaki Dhulisannibham'* means *Pandu* is like the colour of pollen grains of *Ketaki* flower which is whitish yellow.
2. *Pandutwenuplakshito Rogah Pandu Rogah'* means the disease which resembles *Pandu* Varna is known as *Pandu.*[3]

DEFINITION OF *PANDU*

Sarveshu Chaiteshvih Pandubhavo Yatoadhikoatah Khalu Pandurogah (Su.Ut. 44/4) It is called *Pandu Roga* because of the predominance of paleness all over the body.

SYNONYMS

According to *Sushrut Kamala, Panki, Laghrak, Alas* and *Kumbhahwa* are the synonyms of *Pandu*. In *Rigveda* and *Atharvaveda Pandu* has been described by the name of *Vilohita,* Halima and *Haribha*.[4]

NIDANA (Causative factors)

Nidana is most important as the avoidance of etiological factor forms the first and foremost line of treatment. *Nidana* of *Panduroga* can be classified into following three categories.

1. *Aharaja Nidana*
2. *Viharaja Nidana*
3. *Nidanarthakara Roga*

1) *Aharaja Nidana* (Dietary factors)

- *Kshara- Amla- Lavana-Ushna Ahara*: Excess intake of alkaline, sour, salty and hot food.
- *Viruddha Ahara, Asatmya bhojana*: Too much consumption of incompatible food or unwholesome food.
- *Nishpava- Maha- Pinyaka- Tila taila Nishevan*: Use of cereals, sprouts, sesame seeds and sesame oil in excess.

In the present era, we consume more fast food, junk food, bakery items which add onto the pathogenesis of anaemia. Excess intake of *Pitta* aggravating food items such as black lentil, spicy food items, etc increases the *Pitta* in the body leading to Anaemia. Prolonged and more intake of sweet tastes, carbohydratas, clay produce anaemia. Frequent intake of unwholesome food items and incompatible food may inhibit the normal process of digestion by producing endotoxins known as *Ama* in the body leading to digestive disturbances which disrupts the assimilation also. Over use of sour tastes, hot and alkaline substances may injure the gastric mucosa first and then in combination with vitiated lymph tissue may lead to haemolysis and disturbed metabolism of various tissues following developing of anaemia. Astringent taste is an aetiological factor of anaemia mentioned in *Harita Samhita*.

Salty taste is mentioned as a causative factor of anaemia by *Acharyas Charaka* and *Sushruta* whereas sour taste is mentioned as a causative factor in all Ayurveda textbooks. Sour taste depletes the muscle tissue and causes looseness of the muscles. Salty taste vitiates the blood tissue. According to *Acharya Susruta*, excessive intake of sour and salty tastes produce looseness of the muscles and joints and affects the complexion too. Excess use of wine and spicy food items aggravates *Pitta Dosha* and when they are used for a prolonged period of time, it causes pathological changes in the Iiver and stomach which will be observed in the form of gastritis or even ulceration ultimately producing anaemia by disturbing *Ranjaka Pitta*, one of the subtypes of *Pitta Dosha* which is responsible for importing red colour to the blood.

Under nutrition that is poor eating habits, unhealthy snacks, increased fast food consumption and inadequate diet due to fast lifestyle can result in protein deficiency causing undernourishment of all tissues as well as deficiencies of vitamins and folic acid which can cause anaemia. These nutritional factors disturb the physiological formation and functioning of blood tissue leading to anaemia.

2) *Viharaja Nidana* (Lifestyle factors)

- *Ati Vyayama*: Excess physical exertion
- *Ati Maithuna*: Too much indulgence in sex
- *Divaswapna- Vidagdhe Anne Divaswapna*: Sleeping during the daytime or sleeping when there is indigestion
- *Vegadharana*: Suppression of natural urges
- *Mrid Bhakshanam*: Pica-consumption of mud
- *Madhyam*: Excess intake of alcohol
- *Ritu Vaishamya*:Abnormal climatic changes
- *Kama-Chinta-Bhaya-Krodha-Shoka*: Negative emotions such as anger, grief, worries, etc.

Habits and lifestyle include both physical and mental activities. If one adopts unhealthy lifestyle and habits, it may compromise inmunity which in turn affects the tissue health leading to the formation of anaemia. Excessive exercise, excessive sexual intercourse, increased physical activity leads to disturbance in the *Dosha* balance leading to anaemia. Likewise, suppression of natural urges and day sleep also disturbs the *Doshas*. Whereas climatic changes or abnormal seasons upset the normal functioning of the body. Mental activities like excess worry, grief, fear, anger leads to disturbance in the homeostatic condition of the body which also leads to anaemia. As majority of the persons suffering from anaemia fall in the lower or middle income groups, it can be understood that worry is also one of the important factor in all types of anaemia.

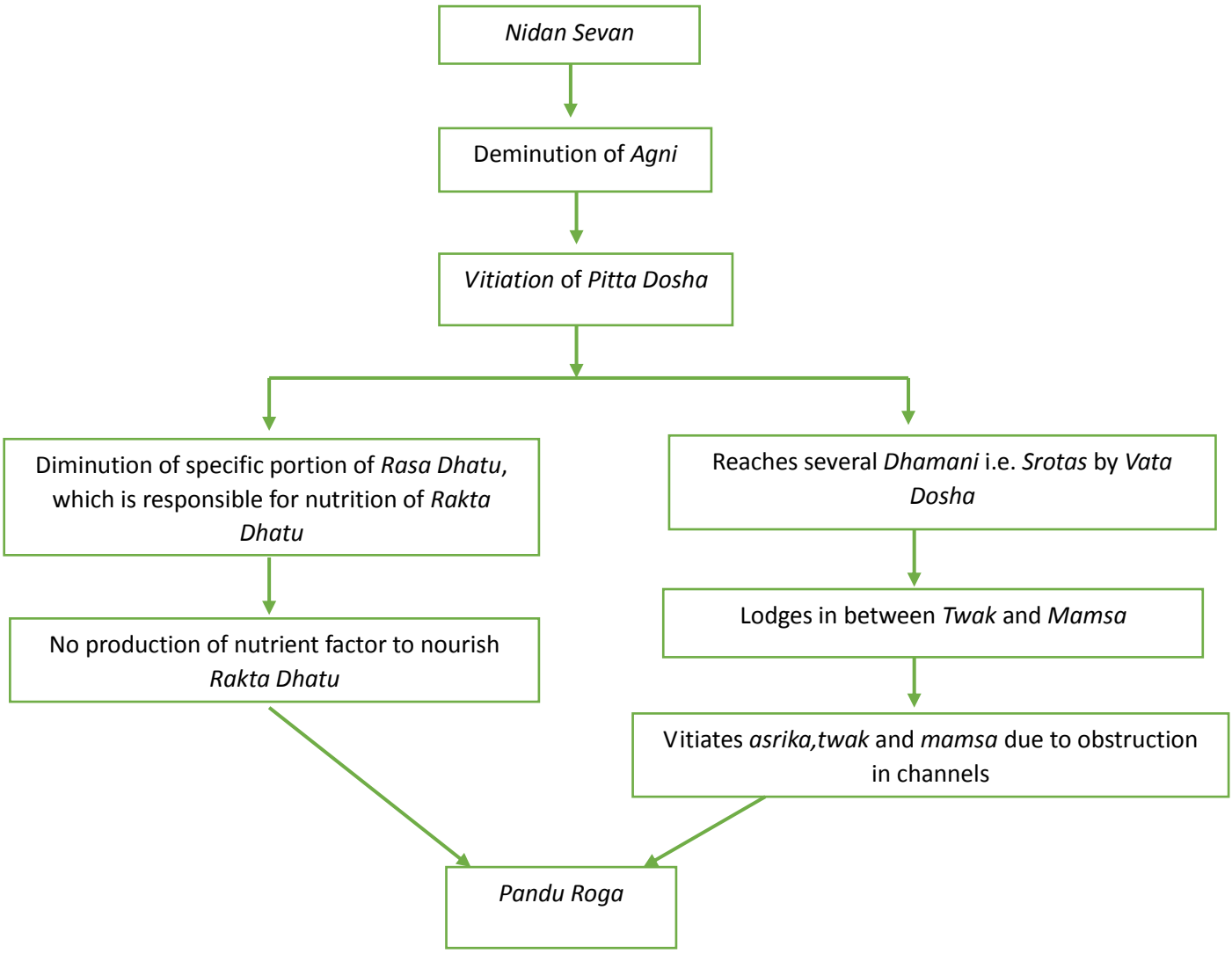
If a person has a habit of performing excessive exercise regularly, the metabolic activity of the body increases and the biochemical actions are tented resulting in more production of carbon dioxide and water and liberation of energy which is utilised for the activity of the body during exercise. Thus it is seen that there is loss of energy from the body during severe exercise and if one does not take adequate amount of nutrition to compensate the loss, then naturally the requirements will be obtained from the tissues of the body itself and ultimately there will be general degeneration leading to diminution of the tissue health and ultimately depletion of *Ojas* or vitality. Moreover, due to increased tissue metabolism, there is tissue depletion again as is mentioned in *Charaka Samhita*.

3) *Nidanarthakara Roga*

In *Ayurvedic* literature *Panduroga* has been indicated either as a symptom of many diseases or as *Upadrava*. So, all these diseases can be considered as *Nidanarthakara Rogas* of *Panduroga*. Some of which are *Raktarsha, Kaphaja Arsha, Raktarbuda* etc.[5]

***Samprapti* (Pathogenesis)**

Acharya Charaka has mentioned the *Samprapti* of *Pandu* in *Chikitsa Sthan*. According to him, due to consumption of *Nidana Pitta* located in the *Hridaya (Sadhak Pitta*) gets aggravated and being expelled from *Hridya* by powerful *Vata* and it enters the *Dasha Dhamanya* (attached to the heart) and circulates all over the body. This aggravated *Pitta* reaches the space between skin and muscle tissue and brings vitiation in *Kapha, Vata, Asrika, Twaka and Mamsa*. This leading to abnormal types of colouration like *Pandu*, *Haridra* and *Harita* to the skin.



Samprapti Ghataka

- ✓ *Dosha – Pitta Pradhan Tridoshaja*
- ✓ *Pitta - Sadhaka, Ranjaka* and *Bhrajaka*
- ✓ *Kapha – Avalambaka, Kledaka*
- ✓ *Vyana- Vyan Vayu*
- ✓ *Dushya - Twaka, Rasa, Rakta, Mamsa* and *Meda*
- ✓ *Strotas – Rasavaha, Raktavaha*
- ✓ *Stroto Dushti - Sanga* and *Vimarga Gamanam*
- ✓ *Agni - Jatharagni* and *Dhatvagni*
- ✓ *Agni Dushti - Mandagni*
- ✓ *Udbhavasthaan - Amashaya*
- ✓ *Adhishthana - Twaka Mamsa Abhyantara*
- ✓ *Vyaktasthaan - Twaka*
- ✓ *Sancharasthaan – Twaka* & *Mamsa*
- ✓ *Svabhav – Chirkari*

PURVARUPA (PREMONITORY SYMPTOMS)

According to *Acharya Charak*

1) *Hridyaspandanam* (Palpitation)
2) *Rokshyam* (dryness of the skin)
3) *Swedabhavah* (absence of sweating)
4) *Shramsatatha* (fatigue)

According to *Acharya Sushruta*

1) *Twaksphotnam* (cracking of skin)
2) *Shthevan* (salivation)
3) *Gatrasada* (sense of lassitude in the limbs)
4) *Mridbhakshanam* (liking for mud intake)
5) Prekshankootsothhah (swelling over eye socket)
6) *Vid-Mutra Pitata* (yellow colour of stool-urine)
7) *Avipaka* (Indigestion)

RUPA (SYMPTOMS)

Acharya Charak has mentioned the *Samanya* and *Vishesh rupa* of *Pandu Roga* in chapter 16 of *Chikitsa Sthan* according to the *Dosha* involvement which is mentioned below.

Samanya Rupa

1) Loss of *Indriya Bala*, *Tej*, *Veerya* and *Oja*.
2) Loss of *Bala*, *Varna and Agni* (power of digestion).
3) *Karnashveda* (tinnitus), *Durbalya* (general weakness), *Annadwesha* (aversion towards food), *Shrama* (fatigue), *Bhramanipidita* (giddiness), *Gatrashula* (body ache), *Jwara* (fever), *Shwasa* (breathlessness), *Gaurava* (heaviness), *Aruchi* (anorexia).
4) *Akshikutashoth* (swelling over orbit), *Shirnaloma* (hair fall), *Hataprabha* (body complexion become greenish)
5) *Kopana* (dislikes cold things), Nidralu (feeling of drowsiness), Alpawaka (avoid speaking), Shtheevan (spitting frequently)
6) Pindikodweshthana (calf muscle pain), *Kati-uru-Paad Ruka* (pain and weakness in the lumbar, thighs and feet), *Arohaneayasa* (patient feels ex hausted on climbing)

Vishishta Rupa

Acharya Charka had classified *Pandu Roga* into 5 types; based on these types *Vishesh Rupas* are described.

1) *Vataj Pandu- Krishna-Panduta* (black and pale yellow discolouration), *Rukshata* (roughness), *Aruna-Angatam* (Reddishness of the body), *Angmarda* (body ache), *Ruja* (pain), *Toda* (Prick ing type of pain), *Kampa* (tremor), *Parshvashiro ruja* (pain in chest-head), *Varchashosh* (dryness of stool), *Aashyavairasya* (distaste in mouth), *Shopha* (edema over body parts), *Aanah* (consti pation), *Bala-Kshaya* (weakness).
2) *Pittaja Pandu- Pita-Haritabhata* (complexion become either yellow or green), *Jwara*, *Daha* (burning sensation), *Trishna* (excessive thirst), *Murcha* (fainting), *Pipasa*, *Pitamutrashakruta* (yellowish discolouration of urine and stool), *Sweda* (profuse sweating), *Sheetakamta* (increase desire to take cold things), *Katukasayta* (feeling pungent taste in mouth), *Ushnaamlanupashyata* (uneasiness for hot and sour things), Vidahe *vidagadhe Anne* (feeling of burning sensation during indigestion of food), *Daurgandhya* (foul smell of body), *Daurbalya* (weakness), *Bhinn varcha* (diarrhea)
3) *Kaphaja Pandu- Gaurava* (heaviness), *Tandra* (Drowsiness), *Chhardi*, *Shvetavbhasta* (whitish complexion), *Praseka* (excessive salivation), *Lomoharsha* (Horripilation), *Murchha* (Fainting), *Bhrama* (giddiness), *Klama* (mental fatigue), *Sada* (looseness of body parts), *Kasa*, *Shwasa* (dyspnoea), *Alasya* (laziness), *Aruchi* (anorexia), *Vaka-swaragraha* (obstruction of speech and voice), *Shukla Mutra-Akshivarchasa* (whitish

discolouration of urine, eye and stool), *Katurukshoshna Kamta* (feeling to take pungent, Hot and dry things), *Shwayathu, Madhurasyata* (sweetishness in mouth).

4) *Tridoshaja Pandu*- Sign and symptoms of all the three vitiated *Doshas* are present, and this is extremely intolerable because of developing complications.
5) *Mridbhakshanajanya Pandu*: - *Bala-Varna-Agni Nash* (loss of strength, complexion, and power of digestion metabolism), *Ganda-Akshikuta-Bhru Pad-Nabhi-Mehan Shotha* (oedema on cheek, eye socket, eyebrow, feet, umbilical region, genital parts), *Krimi Koshta* (Appearance of intestinal worm), *Atisaryet Mala Sasruka Kapha* (diarrhoea associated with blood and mucus).

UPADRAVA

According to *Acharya Sushruta Aruchi, Pipasa, Vaman, Jwara, Murdharuja, Agnisada Shopha, Kan thagata Abalatwa, Murcchha, Klama* and *Hruda yapidana* are the *Updrava* of *Pandu Roga*.

SADHYA-ASADHYATVA

Patient of persistence chronic *Pandu Roga* whose *Dhatu* gets *Khar* does not cure. Also develops oedema observes all the objects yellowish in colour. *Sharir Dhatus* becomes *Ruksha* and a decrease in *Bala* and *Varna* occurs and *Shotha* develops. *Rogi* suffers from constipation and passes loose stools with mucus having greenish discolouration and becomes *Deena*, suffers from *Murcha* and *Trushna*.[6]

MANAGEMENT OF *PANDU ROGA*

In *Ayurveda*, three general principles of treatment have been mentioned in *Charaka Samhita*. They are Daivavyapashraya, Yuktivyapashraya and Satvawajya. Here only *Yuktivyapashraya Chikitsa* has been mentioned which is as follows.

1. *Nidana Parivarjana* (Avoidance of aetiological factors)
2. *Snehana* (Oleation therapy) and *Swedana* (Fomentation therapy)
3. *Shodhana* (Eliminating the factors responsible for producing the disease).
4. *Shamana* (Palliative treatment) to correct the deficiency or abnormality and also treat the allied symptoms.[7]

Concept of *Pathya* in *Pandu roga*

Pathya means suitable for the way or course of anything, which is healthy for treatment or in a medical sense of diet, types of diet regarding wholesome.

Dietary regimen and activities which are helpful for the body and mind without any undesirable effect on health are considered as *Pathya* (wholesome diet). Opposite to the *Pathya* regarded as *Apathya*. Effects of *Pathya* or *Apathya* depend on the dosages, time, mode of preparation, geographical location, the body constitution and *Dosha*. The physician who desires success in treatment must prescribe dietary articles considering the proper dose etc. and natural properties of drugs.

Pathya* (Diet) in *Pandu Roga* according to *Ayurveda

Varga	*Charak Samhita*	*Sushrut Samhita*	*Yogratnakar*	*Bhavaprakash*	*Bhaisaja Ratnavali*
Kritanna Varga	*Peya, Vilepi, Yavagu, Yusha, Khada, Kambalika*	*Peya, Vilepi, Yavagu,*			
Shamidhanya	*Mudga,Masura Adhaki*	*Mudga, Adhaki, Masura*	*Mudga, Adhaki, Masura*	*Mudga, Adhaki, Masura*	
Shukadhanya	*Purana yava and Godhum, Jeerna shali*	*Purana yava and Godhum, Jeerna shali*	*Purana yava and Godhum, Jeerna shali*	*Purana yava and Godhum, Jeerna shali*	
Gorasa Varga	*Godugdha, Ajadugdha, Takra, Ghreet and Navanita*				
Mamsa Varga	*Jangala Mamsa Rasa*	*Jangala Mamsa Rasa*	*Jangala Mamsa Rasa*	*Jangala Mamsa Rasa*	
Shaka Varga					*Patola, Kushmanda, Raw Banana, Jivanti, Guduchi, Chaulai, Punarnava, Dronapuspi, Brinjal, Garlic, Saunf, Sunthi*
Phala Varga		*Badara, Amalaki, Draksha,*			*Pakwa Amra, Haritaki, Bimbi, Amalaki*
Ikshuvarga		*Ikshurasa, Guda, Sarkara,*			
Mutra Varga	*Gomutra*				
Madyavarga	*Tushodaka, Sauviraka, Kanji, Chukra*				
Anya	*Yava Kshara*				

Ahara dravya such as *Adraka, Bimbi, Chukra, Draksha, Haridra, Katphala, Lasuna, Pippali, Kanji* etc are mentioned in different *Nighantu* under the heading of *Pathya* of *Panduroga*.

Pharmacological Activities of *Pathya-ahara* (Diet)

Name of *Dravya*	Chemical Composition	Mode of action
***Jeerna Shali* (old types of rice)**	It contains protein, leucine, lysin, tyrosine, valin. *Rakta shali* is rich source of iron.	It has *Snigdha* and *Vatahara* property. It gives strength, satiation along with nutrition. It stimulates the digestive power.
***Jeerna Yava* (old-barley)**	Barley grain consists of about 65-68% starch, 10-17% protein, 2-3% free lipids, 4 9% β-glucans, 1.5-2.5% minerals (such as zinc (up to 50mg/kg), iron (up to 60mg/kg), calcium, phosphorus) and soluble fibers along with higher amounts of vitamins A, E & B 12 than the other cereals	The amount of Fe supply from barley is very sufficient. Due to presence of chlorophyll, it is good for anaemia. Chlorophyl stimulates haemoglobin production. It contains Vit-B-12 which helps to uptake of iron to combine with globin to form haemoglobin.
***Chukra* (Rumex vesicarius)**	Tartaric acid, vitamin-B12, calcium polyphenolic. Tamarind fruit is also considered as a digestive, carminative, laxative, expectorant and a blood tonic.	It contains tartaric acid which helps promoting iron absorption and Vit-B_{12} which helps to uptake of iron to combine with globin to form haemoglobin.
***Draksha* (Type of Grapes)**	Tannins, tartaric acid, organic acid and amino acid	Contains tartaric acid and amino acids which helps promoting iron absorption
***Haridra* (Turmeric)**	Anti-inflammatory and anti-neoplastic agent. It contains curcumin.	Turmeric has ability to absorb intestinal iron due to presence of Curcumin. It binds ferric iron (Fe3+) to form a ferric-curcumin complex and represses the synthesis of hepcidin. One of the peptides which helps to iron balance in blood. It also has anti-inflammatory, anti-oxidant, antihepatotoxic activity.
***Lasuna* (Garlic)**	Allicine	The garlic enhances iron absorption by increasing ferroportin expression in to the blood stream, when given in the presence of iron. Excessive intake of garlic causes haemolytic anemia. But aged garlic extract has role to prevent sickle cell anemia.
***Pippali* (Long pepper)**	Piperine	Inflammation leads to an increase in Hepcidin expression. Black paper prevents anemia through reduction of inflammation caused by hepcidin

		over-expression.
Sunthi, Marich **(Dry Zinger, Black paper)**	Black paper contains piperine. Zinger has Water–9.4gm, Protein–9.1gm, Fat–6.0gm, Total carbohydrate– 70.8gm, Fibre–5.9gm, iron– 12mg, magnesium 184mg, Phosphorous- 148mg, potassium 1342mg, sodium-32 mg, zinc–5mg and niacin-5mg and Thiamine–0.035%, Riboflavin–0.015%, Niacin–0.045%, Pyridoxin–0.056%, Vitamin C–44%, vitamin A-Traces and vitamin E Traces-Total 44.15%. It is rich in natural polyphenols, which are prebiotics to the gut microbiota.	The binding potential of piperine with SMAD1 and STAT3 proteins supported the proposed inhibition of hepcidin activating proteins. We know that hepcidin is a circulatory hepatic peptide hormone which is responsible for systemic iron homeostasis. Inflammation leads to an increase in hepcidin expression, which dysregulates body iron level. Ginger's bioactive polyphenols promotes gut health and reduces the unwanted side effects of iron tablets. Ginger polyphenols also responsible for to enhance the effectiveness of erythropoiesis. Ginger (antioxidant agent) helps to reduce oxidative stress for iron supplements and also helps in iron absorption. It has Katu Pradhan rasa. Due to this it promotes Agni, manages Aruchi and improves iron bioavailability.
Kanji **(Prepared food with sour taste)**		A study has also shown the mechanism for the increased bioavailability of iron from lactic fermented vegetables is likely an effect of the increase in ferric iron (fe3++) species caused by the lactic fermentation.
Go-Dugdha **(Cow's milk)**	Cow milk is an iron-poor food. A 240ml milk serving 0.07mg Iron. Rich source of calcium.	Individuals are benefited by calcium without negatively affecting their iron.
Madhu **(Honey)**	Honey has a content of 80-85% carbohydrate, 0.3% protein, phenols and 31% fructose.	Honey helps to increase antioxidant agents, serum Iron, monocytes, lymphocytes (slightly), vitamin C concentration by beta-carotene, uric acid and glutathione reductase. It caused slight elevation of zinc and magnesium, hemoglobin, and packed cell volume in blood.
Karavellaka **(Bitter melon)**	Protein, vitamin-C, folic acid, calcium, sodium, potassium, iron, copper, zinc, etc.	Extract of Momordica charantia responsible to increase haemoglobin.
Guda **(Jaggery)**	It is the rich source of iron.	This helps provide the body with the necessary iron that it needs to maintain an optimum hemoglobin count. It is the rich source of iron, magnesium, calcium and others electrolytes.

Kushmanda **(Winter melon)**	*Kushmanda* is rich in vitamins B1 B3 and C. Possesses various minerals like calcium, sodium, potassium, selenium and 96% of water.	A good source to maintain energy levels.
Kadali **(*Tarun*), (Raw banana)**	Raw banana contains campesterol (4.1mg/100g), stigmasterol (2.5mg/100g) and β-sitosterol (6.2mg/100g) along with Zn, Ca and Fe.	Supplementation, fortification and biofortification are strategies that have implemented worldwide to increase iron intake. Banana is a potential vehicle for iron fortification. It is the rich source of vit-E and flavonoids.
Vartaka **(Brinjal)**	Contains-thiamine, niacin, iron, copper, vit-B6, potassium and manganese.	
Adhakii **(Pigeon pea)**	It is the rich source of amino acid, vit-B 12, niacin etc.	Vit-B 12 helps to uptake of iron to combine with globin to form haemoglobin.
Godhuma **(Types of Wheat)**	It is dietary source of iron, & Zinc 3-4gm iron present in 100gm.	
Bimbi **(Ivy gourd/Scarlet gourd/ Gentleman's toes)**	b-sitasterol, urosilic acid etc magnesium, potassium, cadmium, iron etc.	It acts against hepato toxicity.
Punarava **(Boerhaavia diffusa)**	b-sitasterol, urosilic acid etc. magnesium, potassium, cadmium, iron etc.	
Amalaki **(Indian gooseberry).**	Vit-C, Gallic acids, Amlic acid, phyllantine etc.	The better dialysability of iron obtained with Amlaki juice. It is a richest source of vitamin c which reduces ferric iron into ferrous and helps in producing red blood cells. Also, Rasayan to prevent Ojokshaya.
Mudga **(Green gram beans)**	It is a dieter friendly, rich in iron (3.9mg/100gm) and potassium (1150mg /100gm)	Mudga is Madhur, Kshaya ras, Laghu ruksha, Sheet virya, Madhura vipaki and increase Kapha, decrease Vata-pitta.
Masura **(lentil)**	It is the rich source of carbohydrates, protein, fat, and numerous essential nutrients such as folate, manganese, thiamine, potassium, phosphorus, iron and Zinc.	Sweet and astringent, easy to digest, increase Pitta, relieves Vata and Kapha.
Takra **(buttermilk)**	It contains lactic acids.	Different studies have been carried out on the effects of dairy products in iron absorption. Some studies suggest that consumption of dairy products in daily life probably has no effects upon iron absorption. But

		lactic fomentation of foods increases iron bioavailability.
***Patol* (Pointed gourd)**	Vitamin-C, tannins, saponins, vitamin-A etc.	It has hepatoprotective activity.
***Jangal Mamsarasa* (Soup prepared by meat-chicken)**	It (Chicken) contains protein-24.68gm, Fat 12.56gm, Vit-A & B5, iron-1.16mg/100gm.	
***Navanitaka* (Butter)**	It has 80% milk fat, around 60% water, 1.5 2.0% salt & 2% other milk solids. It also contains 67% saturated fat approximately, 29% monosaturated fat, 4% polyunsaturated fat.	Saturated fat increase iron absorption by changes in the fatty acid composition of the intestinal mucosa.
Ghrita	Contains 98.9% lipids, 0.3% water, <0.9% non fat solids. Ghee is also an important carrier of fat soluble vitamins (A,D,K,E)	Regular consumption of ghee in adequate quantity, imparts various health benefits such as binds toxins, enhance complexion of body, rejuvenate the eyes and increases physical and mental stamina etc.
Vilepi		It is beneficial for the heart, stimulates appetite, pacifying thirst and increase strength. It light in nature.
Peya		It is beneficial for hunger, thirst, diseases of abdomen and fever. It acts as diuretic and carminative.

Nutritive value of *Pathya* (Wholesome Diet) advised in *Panduroga*

Name of the Food (100gm)	Carbohydrate (Gm)	Protein (Gm)	Fat (Gm)	Iron (%)	Calcium (%)	Vit-A, Vit-C (%)	Magnesium (%)	Calorie (kcal/100 gm)
Rice	28	2.7-3.0	0.3-0.8	1	1	-	3	100-130
Mudga	58	25	0.2	18	-		8	339
Adhaki	63	22	1.5	28	13	-	45	343
Masura	56	21	1	35	6	-	-	358
Kukkuta mamsa	-	34.0	3.6	5.8	1.2	Vit A-0.4		165
Patol	2	2	0	0	2	Vit A & C-2		215-0
Kushmanda	11	2	0			Vit C-14	12	21-35
Kadali	51.4	2.5	0.2	15	10	114IU/19.6mg		99-180
Punarnava	10.56	5.75	1.61					
Amra	15	0.8	0.4	1	1	60%, 21%	-	60
Fish	0	15.57	2.73	2.19	219.3mg	4.2IU	-	88-100
Keshara	65.37	11.43	5.05	11.10mg	111mg	530IU	-	300-310
Brinjal	6	1	0.2	1		-	-	25
Lasuna	45	8.7	0.7	2.3mg	246mg	42.4mg		200
Pippali	-	-	-	3.61mg	268mg			

Sunthi	18	1.8	0.8	3	1			80
Dadima	18.7	1.67	1.17	0.30mg	10mg			
Haritaki	1	1.4		30mg	3	Vit C 10.5mg	-	5
Milk	5	3.4	2.0	1gm		12		70
Haridra	64.9	7.83	9.88	41.42mg	183mg	25mg	-38mg	354
Bimbi								19kCal/100gm
Amalaki	8	1	1	0.9mg	25mg	290IU, 478mg	10mg	33

To achieve dietary adequacy of iron by using food approaches, food preparation and dietary practices plays an important role. As cereals and tuber-based diets are the sources of low iron. But legumes can improve the iron content if it is taken as daily diet. Food based approaches are not sufficient to increase the level of iron and zinc unless some meat and poultry or fish are included. Avoid some inhibitor and intake some enhancers' factors which are essential to absorb iron. Enhancers factors such as heam iron which are present in meat, poultry, fish and seafood, consumption of ascorbic acid and vit-C, which present in fruits, juices, green leaves, cabbage and fermented and germinated food. The factors, responsible for the inhibition of iron absorption in intestine are high extraction flour cereals grains, nuts, legume, tea, coffee etc.[8]

Dietary Advisory for Anaemia in pregnancy

Iron deficiency anaemia is the most prevalent and the most neglected nutrient deficiency in the world, particularly among pregnant women. During pregnancy, increased maternal iron is needed as a result of the demands of the growing foetus, placenta and expanded maternal blood volume. The developing foetus is entirely dependent on mother for nutritional requirements. All iron delivered to the baby comes from either maternal iron stores or absorption of iron from the maternal diet.

1) Milld Anaemia (Hb of 10–10.9 g/dl)

Dietary Modification Follow 5 'Rights' of *AYURPOSHAN* i.e.

- ✓ The right Time,
- ✓ The right Quantity,
- ✓ The right Quality,
- ✓ The right Methods
- ✓ The right place

Food Fortification

- Include spices in small quantity like Jeera (Cumin seed), *Shunthi*/aadrak (Dry/Wet ginger), Lashuna (Garlic), Elaichi (Cardamom), Ajwain (Carom seeds), Haldi (Turmeric), Dalchini, (Cinnamon) *Marich* (Black pepper) etc. while preparing food.
- Drink milk processed with *Shatawari* (Asparagus racemosus Willd.), *Bala Beeja* (Sida cordifolia L.), *Vidari* (Pueraria tuberosa (Willd.) DC.) and *Munakka* (Raisins)
- Use *Sahijan/ Shigru* (Drumstick) Leaves, Fruits, Pods (Vegetable/ Sambar/ Powder with milk) in diet.

Sahijan/Shigru (Drumstick) leaves contain fiber, fat, proteins and minerals like Ca, Mg, P, K, Cu, Fe, and S. Vitamins like Vitamin-A (Beta carotene), vitamin B-choline, vitamin B1-thiamine, riboflavin, nicotinic acid and ascorbic acid are also present.

Dietary Diversification

- Prepare vegetables, grains, or food recipe of individual choice distinctly. Bajra (Pearl millet), Mudga (Mung bean/green gram), Mashur (Lens culinaris Medik.) can be included.
- Use Chutney made up of Dhaniya (Coriander leaves)/Karhi patta (Murraya koenigii (L.) Spreng.)/ Narikel (Coconut) /Imli (Tamarind)/ Mirch (Green chilli)/ Lahsun (Garlic) in daily diet.
- Use Traditional recipes intermittently- Guda (Jaggery) with Chana (Roasted chickpeas) /Moongphali (Peanut), powder of Saunf (Fennel) mixed with Mishri (Rock sugar) and water, Sattu (Flour of roasted chickpeas), Beetroot Halva, Dhan ki Kheer, Green Gram and Methi(Fenugreek Leaf) Chilla, Mixed Millet and Drum-stick Leaves Dosa, Ambadi (Sorrel leaves), Ragi (millet), Hurihittu, Enduripitha, Bathua Parantha, Mulai Keerai masail etc.
- Include variety of articles from maximum food groups (Cereals, Pulses, Fruits, Vegetables, Milk and Milk Products, Meat and Meat products) in the diet.
- Avoid Food Articles/ items Inhibiting Iron Absorption i.e. Tea and Coffee
- Avoid excessive intake of food having *Amla* (Sour), *Lavana* (Salt), *Katu* (Pungent) dominant taste.
- Food Articles/substances increasing Iron Absorption: Vitamin C rich fruits/vegetables/food article like- Nimboo (lemon), Mosambi (Sweet lemon), Santara (Oranges), *Sahijan* (Drumstick/Moringa), *Takra* (Buttermilk), *Amla* (Gooseberry) etc.

Instead of using routine 3-4 types of vegetables, try variety of vegetables in diet

- *Phala–Shaka Varga*: Lauki (Bittlegourd), Kaddu (Pumkin), Karela (Bitter gourd,) Chichinda (Snake gourd), Tinda (Indian squash), Bhindi (Ladyfinger), Patola (Pointed gourd), Torai (Ridge gourd), Lal kaddu (Red pumpkin), Pakva kushmanda (Petha/ Pumpkin Gourd), Sahijan (Drumstick), Tamatar (Tomato), Jeevanti (Leptadenia reticulata (Retz.) Wight & Arn.), Baigan/Vartak (Brinjal) etc.
- *Mool - Kanda Varga*: Dry mulaka (Radish) and *Sneh siddha mulak* (Radish processsed), Gajar (Carrot), Lashun (Garlic), Aadrak (Ginger), Rataloo (Yam), beet root etc.
- Green Leafy vegetables: Palak (Spinach), Bathua (Chenopodium), Methi (Fenugreek), Chaulai (Amaranth), Sahjan (Drumstick), Arbi ka Patta (Taro leaves), Sunsuniya saag or sushni saag (Water clover), kulfa, ghol or luni saag (Purslane), Ambadi (Sorrel Leaves), *Punarnava* (Pigweed) *Tanduliyaka* (amaranth) etc.
- Aangoor (Grapes), Anaar (Pomegranate), Kela (Banana), Nimbu (Lime), Santara (Orange), Mosambi (Sweet lemon), Aam (Mango), Jamun (Indian blackberry) , Amarood (Guava), *Badara* (Berries), *Sitaphala* (Custard apple), Kishmis (Raisins), Khazoor (Dates), Chuhara (Dried dates), *Amla* (Gooseberries fresh and Dried) etc. * Use only seasonal fruits
- Meat (Liver), Chicken, fish (Salmon) & Crabs. (for non-vegetarians) * (Dry salted fish causes digestion problems hence better to avoid. Pork in excess should be avoided.)

2) Moderate anaemia (Hb of 7–9.9 g/dl)

❖ Dietary management as mentioned above

❖ Ayush supplementation under supervision of AMO:

If patient is already on iron supplements and has moderate anaemia then dose, dosage form, duration, *anupana* etc. of the medicine should be assessed by Ayush Medical Officer for further management plan. If the patient is not taking any supplementation, then the following Ayush supplementation can be taken under the supervision of Ayush Medical Officer with suitable dose regimen.

- *Agnidipan* Medicines: *Trikatu Churna/ Guduchi Churna/ Dhanyaka Churna/ Shunthi Churna/ Jeerak Churna*
- *Raktawardhak* Ayush Medicines: *Dhatri lauha/ Punarnavadi Mandura/ Dadimadi Ghrita AnnabhediChenduram/ Saptamrit lauha / Mandoor Vataka / Navayas lauha / Drakshavleh / Dadimavleha / Dhatri avaleha*.

3) Severe anaemia (Hb of <7g/dl)- Refer pregnant mother to higher center.[9]

CONCLUSION AND DISCUSSION

Acharya Kashyapa has stated *Ahara* as *Maha bhaisajya*. All the beings are originated from the food. Food habits or requirements of *Pathya* depend on individual. The geographical variation, psychological condition, status of health, power of digestion etc of the person is responsible to make a dietary habit of a healthy or diseased one. Intake of *Pathya* with equitable *Manasika* bhava to achieve a healthy body and prevents the body from upcoming diseases. So, from the above discussion we can make a sample meal plan for adult man and women to prevent *pandu*, which will be beneficial for the physicians in the field of clinical practice. Anaemia treatment plans are individualized, most required 150-200mg iron daily. After thorough review of the *Pathya* of *Panduroga* which have been mentioned in different *Ayurveda* compendium suggested following diet plan for advices in clinical practice depending on digestive power of individual.[10]

Meal Time	Food Group	Raw	Cooked Recipe	Servings Amount
Breakfast	Lemon/ Dadim juice/ Ikshurasa Sugar	250ml 15gm	Milk	1 cup
	Cereals, Pulses	70gm 20gm	Breakfast item	
Lunch	Cereals Pulses Vegetables Vegetables Fish/meat Fruits-	120gm 20gm 150gm 50gm 100gm 100gm	Rice/Phulka Dal Veg Curry Veg salad Fish/meat curry Seasonal or mentioned food	1 cup/2 in no. ½ cup ½ cup 7-8 slices 2 small nos./4 2(medium size)
Evening	Milk products Guda	50gm 15gm	Milk chick (Chana) snacks	½ cup
Dinner	Cereals Pulses Vegetables milk	120gm 50gm 120gm 100gm	Rice, Phulka Dal Veg curry Milk+ Keshar/pinch of *Haridra*	1 cup/ 2 in no. ½ cup ½ cup 1 cup

Management according to predominance of *Doshas* in *Pandu roga*

- ✓ In cases of *Vatika Pandu* the substances having *Snigdha Guna*,
- ✓ In *Paittika* the substances having *Madhura* and *Tikta Rasa* and
- ✓ In *Kaphaja Pandu* drugs having *Ushna Virya* and in *Tridoshja Pandu*, a mixture of all the above should be prescribed.

- ✓ In *Mridbhakshanajanya Pandu*, the *Mritika* which may be composed of various indigestible and inaccessible substances obstructs various cannels. Thus, it is necessary to remove it by *Tikshna Virechana*.

Here we conclude the dietary management of *pandu roga* as we take care of our daily diet surely the loss will be cured effectively in childrens adults and especially in pregnant mothers. *Rasavaha stroto dushti* symptoms such as –

1. *Bhojana Aruchi* (anorexia)
2. *Gaurava* (heaviness)
3. *Tandra* (drowsiness)
4. *Palitya* (gray hairs)
5. *Mukhvairasya* (tastelessness)
6. *Angamarda* (fever with body ache) etc. are mostly present in the anaemic patients as *Rasavaha Srotas Dushti* is inversely proportional to Hb %, which means > *Rasavaha Srotas Dushti* – less the Hb %. So, anaemia can be prevented at its early stages by monitoring these symptoms of *Rasavaha Srotas Dushti* by taking proper, healthy, nutritious diet to maintain the haemoglobin levels in the body.[11]

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