WORLD JOURNAL OF PHARMACEUTICAL RESEARCH
SJIF Impact Factor 8.453
Volume 13, Issue 13, 1016-1025. Research Article ISSN 2277–7105

AN AYURVEDIC PERSPECTIVE OF PANDU: ANEMIA ALONG WITH RBC MORPHOLOGY

Vaishnav Vinod Dhole[1], Vinayak N. Joshi*[2] and Snehal Mandal[3]

[1]PG (Scholar) Department of Rog Nidan, Dr. D. Y. Patil College of Ayuved & Research Centre, Pimpri, Pune Dr. D. Y. Patil Vidyapeeth, Pune (Deemed to be University).

[2]Professor & HOD Department of Rog Nidan, Dr. D. Y. Patil College of Ayuved & Research Centre, Pimpri, Pune Dr. D. Y. Patil Vidyapeeth, Pune (Deemed to be University).

[3]Consulting Pathologist, Department of Rog Nidan, Dr.D.Y.Patil College of Ayuved & Research Centre, Pimpri, Pune Dr. D. Y. Patil Vidyapeeth, Pune (Deemed to be University).

Article Received on
13 May 2024,

Revised on 03 June 2024,
Accepted on 23 June 2024

DOI: 10.20959/wjpr202413-33047

***Corresponding Author**
Dr. Vinayak N. Joshi
Professor & HOD
Department of Rog Nidan, Dr. D. Y. Patil College of Ayuved & Research Centre, Pimpri, Pune Dr. D. Y. Patil Vidyapeeth, Pune (Deemed to be University).

❖ ABSTRACT

➢ ***Background:-*** Microscopic evidence based RBC Morphology would help ayurveda physicians to give appropriate ayurvedic treatment to Anemia i.e. Pandu patients. Anemia is the most common blood disorder affecting about one third of the global population. ***Aim:-*** To study the correlation of Anemia types with Ayurvedic Pandu along with RBC Morphology. ***Objective:-*** To Observe the correlation of Anemia types with Ayurvedic Pandu along with RBC Morphology. ***Material and Methods:-*** It includes Literature Review, Initial assessment & enrollment of patients, Microscopic observational changes to correlate different types of Anemia with different types of Ayurvedic Pandu, Assessment criteria along with RBC Morphology, Observation & Interpretation. ***Results:-*** It shows the correlation of different types of Anemia with different types of Ayurvedic Pandu along with RBC Morphology. ***Conclusions:-*** This study finds the correlation of different types of Anemia with different types of Ayurvedic Pandu along with RBC Morphology. This study would help ayurveda physicians to give appropriate ayurvedic treatment to Anemia patients on the basis of evidence based RBC Morphology.

➢ ***KEYWORDS:*** Iron deficiency Anemia (IDA), Megaloblastic Anemia (MA), Vataj Pandu, Pittaj Pandu, Kaphaj Pandu.

1. INTRODUCTION

Anemia is the most common blood disorder, affecting about a 1/3rd of the global population. Iron deficiency affects nearly **1 billion** people worldwide. The Prevalence rate of Anemia was about **22.8%** globally in 2019 according to Oxford University Press Journal. Anemia or Anaemia is a blood disorder in which the blood has a reduced ability to carry oxygen due to lower number of red blood cells i.e. reduction in the amount of hemoglobin or hemoglobin abnormalities & the name is derived from ancient greek word meaning 'lack of blood'. Causes of bleeding include surgical bleeding, blood donation, serious injury, bleeding due to inflammation of stomach or intestines. Causes of decreased red blood cell production includes Iron deficiency, Vitamin B12 deficiency, Bone marrow tumours, Thalassemia. Causes of increased red blood cell breakdown includes Malaria, Certain autoimmune diseases, Genetic disorders such as Sickle Cell Anemia.

When Anemia comes on slowly, the symptoms are often vague, such as tiredness, weakness, shortness of breath, headaches, and a reduced ability to exercise. Symptoms of Anemia depend on how quickly hemoglobin decreases. When Anemia is acute, symptoms may include confusion, feeling like one is going to pass out, loss of consciousness, and increased thirst. Anemia must be significant before a person becomes noticeably pale. Additional symptoms may occur depending on the underlying cause. A large number of patients diagnosed with Anemia of chronic disease present with no active inflammation or dietary issues. These include many with reduced Limb loading, such as Spinal cord injured patients, Astronauts, Elderly people with limited mobility, Bed-bound and Experimental bed-rest subjects.

According to ayurveda **acharya charaka** defines different prakar: Types of Pandu: Anemia as Vataj, Pittaj, Kaphaj, Sannipataj, Mrudbhakshanaj Pandu (*पाण्डुरोगाः स्मृताः पञ्च वातपित्तकफैस्त्रयः| चतुर्थः सन्निपातेन पञ्चमो भक्षणान्मृदः||* *च. ची. १६/३)* but here we discussed only **Vataj**, **Pittaj** & **Kaphaj Pandu**. **Vataj** lakshana includes *Twak pandutwa, Twak rukshata, Angamard, Kamp, Tod, Paarshwashool, Shirshool, Shushka Malpravrutti, Aasyavairasya, Shoth, Aanaha, Balakshaya*. **Pittaj** lakshana includes *Rakta dushti, Raktakshaya, Twak-Nakh-Netra-Mutra-Purish Pitvarniya, Jwar, Daha, Trushna, Murccha,*

Pipasa, Swedpravruti, Katukaasyata, Amlodgar, Vidaha, Daurbalya. **Kaphaj** lakshana includes *Nakh-Netra-Mutra-Twak Paandurvarniya, Gaurav, Tandra, Prasek, Chardi, Prasek, Lomharsha, Angsaad, Murcha, Bhram, Klam, Shwas, Kaas, Aalasya, Aruchi, Shoth, Madhuraasyata.* Need to correlate **Anemia** types like IDA, Megaloblastic anemia, Hemolytic anemia with **Ayurvedic Pandu** types i.e. Vataj, Pittaj, Kaphaj along with **RBC Morphology** for **Ayurvedic Treatment** mentioned in Ayurvedic Texts.

2. MATERIAL AND METHODS

Literature Review

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Initial assessment & Enrollment with written consent

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Microscopic observational changes to correlate different types of Anemia with different types of Ayurvedic Pandu

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Assessment criteria along with RBC Morphology

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Observation, Interpretation & Statical Analysis

2.1 Literature review

It includes Ayurvedic and Modern Medical Science **References**.

2.2 Initial assessment and enrollment of patients

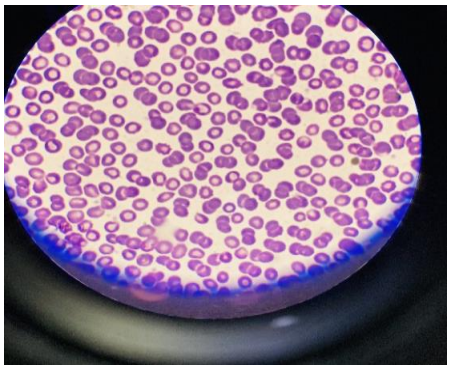
Doshika Predominance of the Pandu Roga Subtypes as observed in the various groups of Anemia as follows.

Types of pandu	IDA	MA	HA
Vataj	18	13	00
Pittaj	5	4	32
Kaphaj	2	2	00

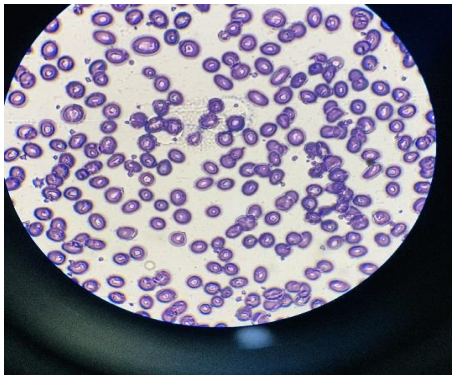
Above reference is taken from Article of Dr. Shalini rai & Dr. Anukul C Kar - A comparative study on the assessment of clinical features of Pandu roga and its subtypes with various types of anemia (AIIA & BHU). With the help of above reference Iron deficiency anemia-**IDA**, Megaloblastic anemia-**MA**, Hemolytic anemia-**HA** can be correlated and included with different types of Ayurvedic Pandu Viz. **Vataj, Pittaj** and **Kaphaj**. 3 Subjects are enrolled in

this study having Iron Deficiency Anemia, Dimorphic Anemia i.e. IDA + MA and Hemolytic Anemia.

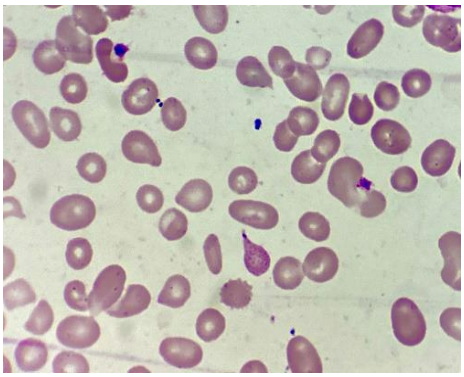
2.3 Microscopic observational changes to correlate different types of Anemia with different types of Ayurvedic Pandu along with RBC Morphologies as follows.



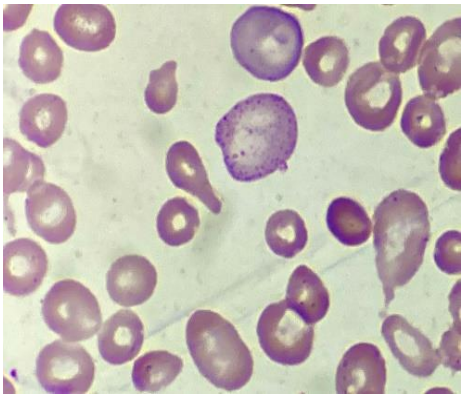
IDA (Microcytic RBC's)



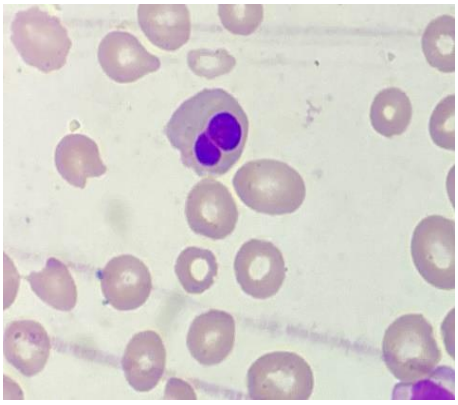
MA (Macrocytic RBC's)



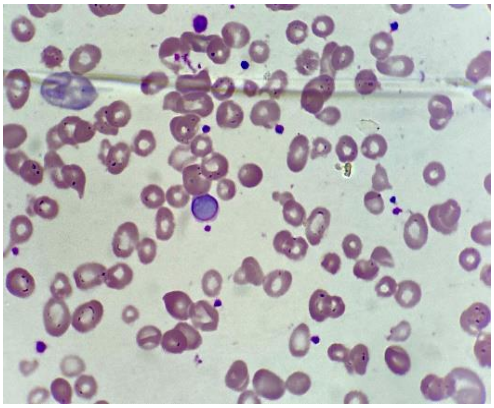
HA (Basophillic Stiplling in Tear Drop RBC)



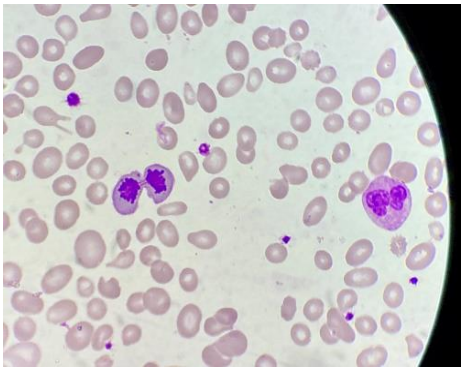
HA (Basophillic Stiplling in RBC)



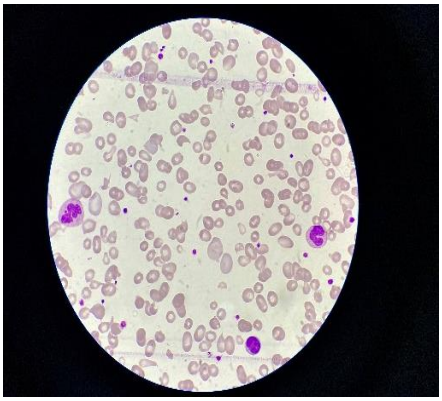
HA (Bilobed Nucleus of RBC)



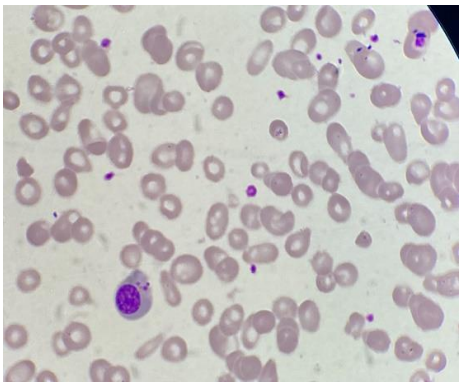
HA (Cabot Ring in RBC)



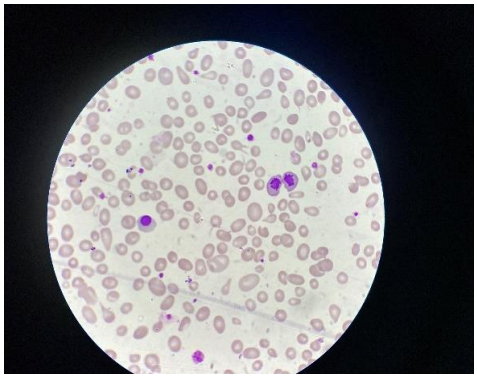
HA (Dyserythropoesis with Nuclear Interbridging)



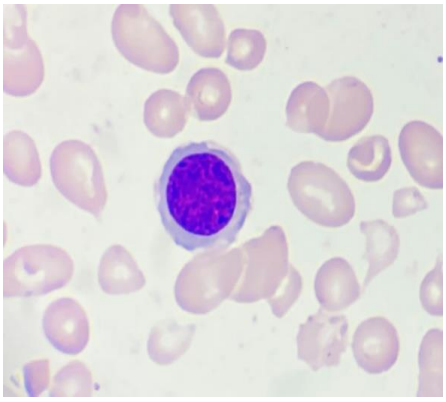
HA (Fragmented RBC's)



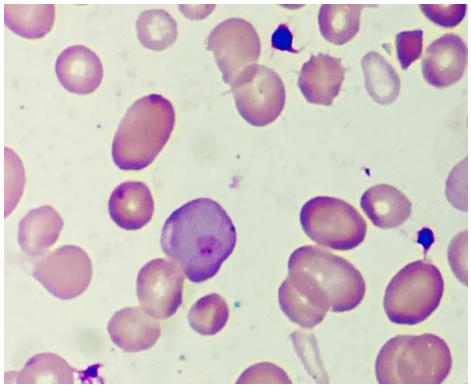
HA (Howell Jolly Bodies/ Pappenhiemer Bodies)



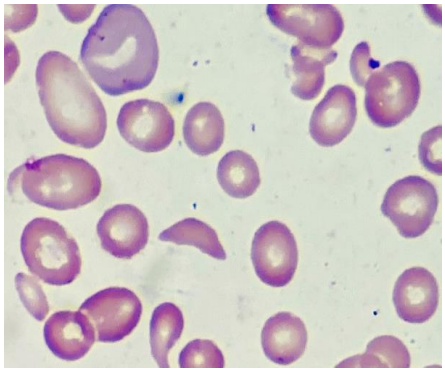
HA (Orthochromatic Erythroblast)



HA (Polychromatic erythroblast)



HA (Polychromatic Cell/ Recticulocyte)



HA (Schistocyte & Stomatocyte)

2.4 Assessment criteria along with RBC Morphology

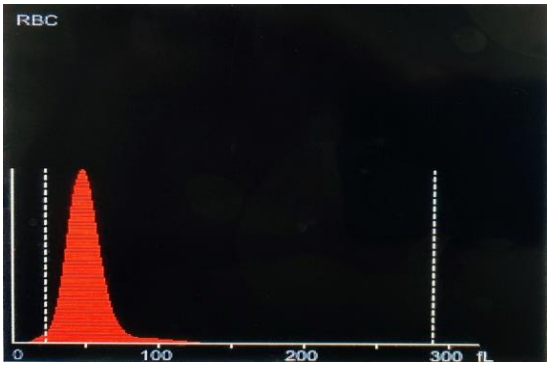
Ayurvedic Pandu Prakar correlated with Anemia types along with RBC Morphology as follows:- **Vataj**, **Pittaj** and **Kaphaj Pandu Prakar** can be easily correlated with **Anemia** of different types as per reference of the above article which shows **Vataj Pandu** had maximum number of **IDA** cases, **Pittaj Pandu** had maximum number of ***HA*** *cases and* ***Kaphaj Pandu*** *had shows* ***Dimorphic Population*** *so i.e both* ***IDA*** *and* **MA** types**.**

Pandu prakar	**Anemia along with RBC Morphology**
Vataj	IDA (Microcytic RBC's)
Pittaj	HA along with Vit B12 Deficiency (Different Morphologies)
Kaphaj	Dimorphic Population i.e. IDA + MA (Microcytic + Macrocytic RBC's)

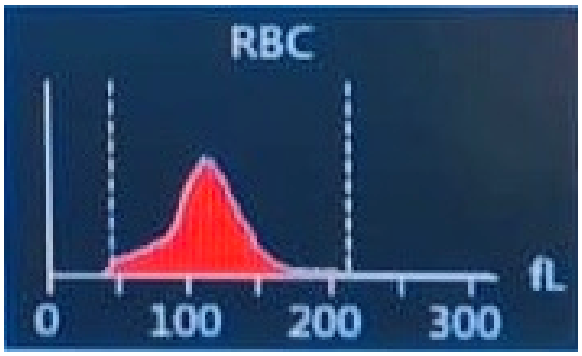
2.5 Observation & Interpretation

It is observed that Pandu Prakar can be correlated with Anemia Types along with RBC Morphology with the help of Patient's Data as follows.

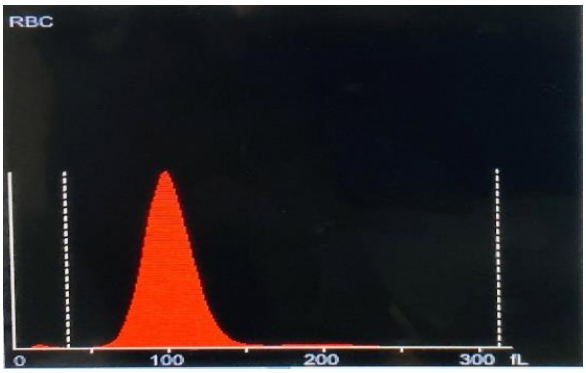
1) First patient had Vataj Pandu lakshana along with Microcytic Hypochromic RBC Morphology i.e. IDA - MCV-50.6, MCH-16.3, MCHC-27.1



2) Second patient had Pittaj Pandu lakshana along with Different Morphologies i.e. HA along with Vit B12 deficiency - MCV-89.6, MCH-31.5, MCHC-34.5



3) Third patient had Kaphaj Pandu lakshana along with Dimorphic Microcytic + Macrocytic Population i.e. IDA + MA - MCV-101.3, MCH-37, MCHC-36.5



Morphology	**Diseases**
1) Microcytic hypochromic anemia (MCV<80 fL; MCH<27pg; MCHC<30g/dL)	IDA Thalassemia Anemia of chronic disease Sideroblastic anemia
2) Macrocytic anemia (MCV>100 fL; MCH>32pg; MCHC 30-35 g/dL)	Megaloblastic – Folate or Vitamin B12 deficiency Others
3) Normocytic normochromic anemia (MCV 80-100 fL; MCH 27-32 pg;	Recent blood loss Hemolysis

MCHC 30-35 g/dL)	Aplastic anemia CRF Anemia of chronic disease Anemia due to infiltration of marrow

3. RESULTS

This study shows the correlation of different types of Anemia with different types of Ayurvedic Pandu along with RBC Morphology.

Pandu prakar	**Anemia along with RBC Morphology**
Vataj	IDA (Microcytic RBC's)
Pittaj	HA along with Vit B12 Deficiency (Different Morphologies)
Kaphaj	Dimorphic Population i.e. IDA + MA (Microcytic + Macrocytic RBC's)

4. CONCLUSIONS

This study finds the correlation of different types of Anemia with different types of Ayurvedic Pandu along with RBC Morphology. This study would help ayurveda physicians to give appropriate ayurvedic treatment to Anemia patients on the basis of evidence based RBC Morphology.

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