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Critical Review on *Beeja Doshaj Pandu Roga* in *Bala Roga* w.s.r. to *Thalassemia*

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ABSTRACT

Thalassemia syndromes are most common single gene disorder in the world and represent a major health burden worldwide. It is a heterogeneous disorder recessively inherited resulting from various mutations of the genes which code for globin chains of Hb leading to reduced or absent synthesis of globin chains. In Ayurveda, *Aacharya Charaka* described *Beeja Dushti Janya Vikaara*. He explained that specific *Avayava* would be *Vikrita*, if *Doshas* vitiate specific *Beeja* or *Beejabhaaga*. Scientists are working to remove excess iron in order to prevent or delay iron overload which is achieved by prolonging blood transfusion interval and searching effective, orally administrable, economical iron chelators to combat the Thalassemia. In Ayurveda *Raktashodhana*, *Raktaprasadana*, *Shonitasthaapana*, *Rasayana*, *Balya* and *Varnya* properties decrease the rapid destruction of RBCs and thus prolonging the Life span of RBCs which increases the interval of blood transfusion. All these factors increase the expectancy of good life of Thalassemic patients.

Key words: *Panduroga, Bala Roga, Thalassemia, Beeja Dosh.*

INTRODUCTION

Thalassemia is one of the major health problems which affect a large number of individuals worldwide. 7% of the worldwide population being carriers, hemoglobinopathies are the most common monogenic diseases and one of the world's major health problems. They were originally found mainly in the Mediterranean area and large parts of Asia and Africa.^[1] Thalassemia is not a disease of "just a few people". Almost 25 million people in India are carriers of thalassemia gene.^[2] Thalassemia is classified

according to the affected globin chain, i.e. α -thalassemia and β -thalassemia. α -thalassemia is caused by a decrease in production of α -globin chains due to a deletion or mutation of one or more of the four alpha globin genes located in the short arm of chromosome 16, whereas β thalassemia is caused by mutation of β -globin gene located on chromosome 11.^[3]

The clinical severity varies widely, depending on the degree to which the synthesis of the affected globin is impaired, altered synthesis of other globin chains and co-inheritance of other abnormal globin alleles. Children born with thalassemia major usually develops severe anaemia, ineffective erythropoiesis, jaundice and haemosiderosis which results in greenish brown complexion and suffer from retarded physical growth, poor feed, hepatosplenomegaly, irregular fever due to increase metabolic activity or intercurrent infection. Increased nutrition demand results in cachexia, fatigue etc. In Ayurveda, *Beeja Doshaja Pandu* can be correlated with Thalassemia, on the basis of etiopathogenesis of the disease and can be interpreted by the application of methodology

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described by Acharya Charaka in *Vimanasthana* in context of *Anukta Vyadhi*.^[4] Thalassemia Major being an incurable disease, improvement in the quality of life of the patient, minimizing the complications of the disease, as well as increasing the life span should be given due emphasis, Ayurvedic drugs improve the quality of life; maintain the patient fit for curative therapies like bone marrow transplant and stem cell therapy.

Saamanya Nidaana of Pandu^[5]

- Excessive intake of alkaline, sour, saline, hot and mutually contradictory food, unwholesome food, *Nishpaava*, *Maasha*, *Pinyaaka* and *Tilataila*.
- Sleeping during day time and exercise as well as sexual intercourse even before the food is not properly digested.
- Improper administration of *Panchakarma* therapies and transgression of prescribed seasonal regimens (*Ritu Vaishamy*).
- Suppression of natural urges.
- Addicted to eating clay or salts.
- Person with his mind afflicted with passion, worry, fear, anger and grief.

Samaanya Lakshana^{[6],[7]}

- *Karnakshweda* (tinnitus)
- *Hataanala* (suppression of the power of digestion)
- *Durbala* (weakness)
- *Sadana* (prostration)
- *Annadwit* (repugnance against food)
- *Shrama* (fatigue)
- *Bhrama* (giddiness)
- *Gatrashoola* (pain in the body)
- *Jwara* (fever)
- *Shwaasa* (dyspnoea)
- *Gaurava* (heaviness)
- *Aruchi* (anorexia)

- *Mrudita Peedita Unmathita Gaaatra* (feels as if all the limbs of his body are being kneaded, squeezed and churned)
- *Shoonaakshikoota* (swelling of the orbital region)
- *Harita* (green complexion)
- *Sheernaloma* (falling of skin hair)
- *Hataprabha* (loss of luster)
- *Kopana* (irritable)
- *Shishiradweshee* (dislikes cold)
- *Nidraalu* (oversleep)
- *Stheevana* (more spitting)
- *Alpavaak* (avoid speaking)
- *Pindikodweshtana* (cramps in calf muscles)
- *Aarohanaayaase Kati - Uru - Paada Rook Sadana* (while making efforts for climbing, he suffers from pain and weakness in the lumber region, thighs and feet).

Concept of Beeja, Beeja Bhaaga and Beejabhaaga Avayava^{[8],[9]}

Beeja which is responsible for the formation of *Rakta Dhaatu* should include Sperm, Ovum and zygote. The chromosome 16 and chromosome 11 can be taken as *Beejabhaaga* which are accountable for the formation of *Rakta Dhaatu*. The gene locus on the short arm of chromosome 16 also called as gene cluster (30 kbp of DNA) and it consists of α and ζ genes and some pseudo genes and the gene locus located on chromosome 11 also called as β gene cluster (50 kbp of DNA), includes the embryonic globin gene, epsilon (ϵ), the fetal globin gene (γ) and two adult globins genes and genes can be considered as *Beejabhaagaavayava* responsible for the formation of *Rakta Dhaatu*.

DISCUSSION

Ayurvedic Etiopathogenesis of Thalassemia

There is no one-to-one correlation for Thalassemia in Ayurveda. *Acharyas* have described various *Sahaja Vyaadhis* like *Prameha*, *Arsha* and *Kushtha* which

occurred due to *Upatapti* of *Beeja*, *Beejabhaaga* and *Beejabhaagaavayava*. These *Sahaja Vyaadhis* are *Asaadhya* in nature. This shows *Acharyas* were well acquainted with the science of genetics and they were knowing the genetical basis of these diseases. The causative factor of these diseases is defected mutation but the reason behind these mutations is not known till date. *Acharyas* described possible cause of *Beejadushti* (defected mutation) in the form of *Maatru-Pitru Apachaara*, *Daiva*, *Poorvakrita Ashubha Karma* and *Prakopa* of *Vaataadi Dosh*. They have also indicated the possible consequences in the form of *Tridosha Prakopa*, *Vikrita Avayava* formation corresponding to biochemical abnormalities or functional abnormalities and structural defects related to *Upatapti* of *Beeja* or *Beejabhaaga*. Methodology of understanding a disease process is explained by *Acharya Charaka* based on *Aptopadesha Pramaana*. On that base, this study has been done to know the etiopathogenesis of *Thalassemia* according to *Ayurvedic* perspective. The disease process can be sequenced as:

- *Upatapti* of *Beejabhaagaavayava* - Mutation in Globin gene locus^[10]
 - Mutation at β - globin locus (more than 200 mutations)
 - Mutations at α -globin locus (more than 30 deletion mutations)
- *Vamshaanugatvatva* (Transmission in the Siblings)
- The *Sampraapti* of the disease in affected individuals Thus, here in the case of *thalassemia* the *Upatapti* of *Beejabhaagaavayava* is the main cause and consequent *Vishamaavastha* of *Dosha*, *Dhatu* and *Mala* which can lead to *Lakshanas* of *Tridosha Prakopa*. *Thalassemia* is an incurable disease. The patient dies due to various complications of the disease as well as the adverse effects of available medicaments.

Sampraapti Vivechana

In the red cell precursors, due to globin gene mutation at the *Beeja* level, there will be *Rakta Dhaatwaagni Dushti* which led to *Vikrita* and

decreased *Rakta Dhaatu Nirmaana* (decreased hemoglobin synthesis).^[11] This severely affects the *Poshana* and *Nirmaana* of *Uttarottara Dhaatu*. *Acharya Harita* has stated that *Rasa Dhaatu* is converted into *Rakta Dhaatu* in seven days by getting new colour each day. *Rasa* gets *Laakshaarasa Varna* on seventh day. But due to *Rakta Dhaatwaagni Dushti* it doesn't get proper coloured. Thus it leads to formation of *Malarooopa Rakta Dhaatu* which is unable to carry out the physiological functions attributed to it. *Paachana* of such *Malarooopa Rakta Dhaatu* leads to formation of *Aama*. Along with all these factors and *Tridoshaprakopa* result in the *Oja Kshaya* and ultimately lead to the clinical features of *thalassemia*.

Sampraapti Ghataka

- *Dosha* : *Tridosha* (Mainly *Vaata* and *Pitta*)
- *Dushya* : *Sarva Dhaatu*, *Upadhaatu* and *Malas*
- *Agni* : *Jatharaagnimaandya* and *Dhaatwaagni Maandya*
- *Srotas* : *Sarvasrotas* (*Rasavaha*, *Raktavaha* mainly)
- *Srotodushti* : *Sanga*
- *Udbhavasthaana* : *Beeja*, *Aamaashaya*
- *Adhishthaana* : *Shareera*, *Mana*
- *Vyaktasthaana* : *Twak*
- *Rogamaarga* : *Baahya*

Management of thalassemia in Ayurveda

The basic cause of the disease is *Beejadushti*, with grave consequences like *Agnimaandya* (both *Jatharaagni* and *Dhaatwaagni*), *Paandutaa*, *Nissaarataa* and *Kshaya* of the *Dhaatus*. The consequent *Tridosha Prakopa*, *Aama* generation (free radical), along with *Dhaatukshaya* complicates the overall outcome of the disease. The modern medical management appears to have various short comings like lack of potent antioxidant, hepatospleno-protective drugs and effective iron chelators without side effects. Thus to improve the quality of life, to maintain the patient fit for curative therapies like

bone marrow transplant a lot can be done by using various drugs which are having properties like, *Amapaachana*, *Srotovishodhana*, *Balya*, *Pittasaaraka*, *Lohashodhana*, *Lohamaarana*, *Raktashodhana*, *Raktaprasaada*, *Shonitasthaapana* and *Rasaayana*. Some of the *Dravyas* that can be useful as iron chelators which are mentioned in our classics as *Apathya* during *Lohasevana*, *Lohashodhana Gana*, *Lohamaarana Gana*, *Lohasevanajanya Vikaara*.

CONCLUSION

There is no exact correlation for Thalassemia in Ayurveda. *Acharyas* described *Sahaja Vyaadhis* like *Arsha*, *Prameha* and *Kushtha* which shows they were well acquainted with the science of genetics. They indicated various *Hetus* for *Upatapti* of *Beeja*, *Beejabhaaga* and *Beejabhaagaavayava* which are responsible for organogenesis of *Vikrita Avayava*. The disease thalassemia can be named as *Beejadushtijanya Pandu* and *Kulaja* or *Aanuvanshika Pandu*.

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