

A REVISED AYURVEDIC APPROACH TO SICKLE CELL DISEASE

Gauridutt Mishra¹, D. H. Pandya²

¹Ph.D. Scholar; ²Assistant Professor;

Department of Roga Nidana Evam Vikriti Vijnana,

Institute for Post Graduate Teaching & Research in Ayurveda, Gujarat Ayurved University, Jamnagar-361008, Gujarat, India.

Email: gauridutta@rediffmail.com

ABSTRACT

Background: SCD is a genetic life-long blood disorder characterized by Red blood corpuscles that assume an abnormal, rigid, sickle shape – sickling decrease the cells flexibility and results in a risk of various complications. Life expectancy is shortened, average life expectancy in male & female are 42 & 48 yrs. respectively. SCD can be compared with *Pandu Vyadhi* in *Ayurveda*, to understand the *Ayurvedic* perspective of SCD we have to understand all the related pathophysiology of *Rakta Dhatu* i.e. its *Utpatti*, *Hetu*, *Lakshana*, *Samprapti*, *Chikitsa Siddhant* etc. SCD occurs more commonly in people belongs to tropical & subtropical regions where malaria is or was common. According to *Ayurveda Beeja-Dushti* play major role in its pathogenesis. **Aim:** To establish correlation between sickle cell disease and *Pandu Vyadhi*. **Material & Method:** compilation of literary materials from *Ayurvedic* classics specially *Charaka* and *Sushruta Samhita* and its available commentary as well as different webs. **Discussion:** The genetic basis of SCD is well established. So, *Beeja Dushtijanya Pandu/ Kulaja Pandu / Anuvamshika Pandu* may be some similarity with SCD. In the present context, the *Doshika* status of the disease can be analyzed as *Vata-Pitta* provocation along with depletion of *Kapha*. **Conclusion:** In this study Genetic basis of SCD and *Beejadushtijanya Pandu* may be proved from both modern and *Ayurvedic* point of view, Both shows similarity in pathogenesis and in some clinical presentation so it can be concluded that Sickle cell disease and *Beeja Dushtijanya Pandu/ Kulaja Pandu / Anuvamshika Pandu* appears to be appropriate for correlation.

Keywords: *Pandu*, *Rakta Dhatu*, genetic, blood disorders, *malaria*, *Beejdosha*.

INTRODUCTION

The human RBCs are circular, biconcave and the diameter of the center is less than periphery, In certain condition when circular RBCs under goes sickle form due to abnormal posting of certain amino acid in Beta chain of adult hemoglobin (A1), the disease is known as SCD. In certain condition when circular RBCs under goes sickle form due to abnormal posting of certain amino acid in Beta chain of adult hemoglobin (A1), the disease is known as sickle cell disease or sickle cell disorder (SCD). Sickle cell disease (SCD) is a serious, inherited, autosomal recessive, lifelong blood disorder characterized by RBCs that assume an abnormal, rigid and sickle shape. SCD is

present since birth but most infants don't show any symptoms until they are about to 5-6 months of age.¹

Aims & Objective

To establish correlation between sickle cell disease and *Pandu Vyadhi*.

Material & Method

Compilation of literary materials from *Ayurvedic* classics specially *Charaka* and *Sushruta Samhita* and its available commentary as well as different webs.

Prevalence

SCD occur more commonly in tropical and subtropical region, *Chhattisgarh* is newly created state of central India belong mostly to tribal and backward classes where malaria is endemic. 15% population of *Chhattisgarh* being sickle cell trait and 1.27% sickle cell anemia, males and females are affected equally.²

Types of SCD³

- Sickle cell anemia
- Sickle Hb C disease
- Sickle Beta plus thalassemia
- Sickle Beta zero thalassemia

Signs & Symptoms⁴

- Fatigue
- Jaundice
- Severe anemia
- Acute pain crises (sickle cell/ vaso-occlusive)
- Dactylitis (swelling & inflammation of the hands and / or feet)
- Arthritis
- Acute Chest Syndrome (Fever, chest pain, coughing, difficulty in breathing and, pulmonary infiltrate on chest X-ray).
- Bacterial Infections

Aggravating factors⁵

- Cold Environment

- Infection
- Dehydration
- Hypoxia
- Vigorous exercise
- High temperature

Sickle cell trait⁶

- Sickle cell trait means person carry a sickle cell gene, but it doesn't normally cause illness, because it is genetically recessive.

Ayurvedic Correlation

SCD is not described as such in *Ayurveda* but disease *Pandu* shown the same characteristic in terms of pathogenesis and cardinal symptoms i.e. *Raktalpata* (Hemolytic anemia), *Shithilendriya* (fatigue),⁷ *Aruchi* (Anorexia), *Hatanala* (reduced digestive fire), *Shwas* (Acute Chest Syndrome - dyspnea), *Arohana-Ayasa*, (tiredness on exertion), *Pindwikadweshtana* (stiffness and tightness in calf muscle) and *Jwara* (fever),⁸ *Parvabheda* (Arthritis like symptoms),⁹ *Klama* (tiredness on rest)¹⁰ etc.

The genetical basis of SCD is well established, so the terms *Kulaja*, *Anuvanshika* or *Sahaja* are mentioned in our classics to denote the inheritable nature of the disease. Thus the name given like *Kulaja Pandu* / *Anuvamshika Pandu* appears to be appropriate for exact correlation.

Table 1- Description of *Pandu Roga* in *Ayurvedic* literature

<i>Samhita</i>	Description of <i>Pandu</i>	Types						
		No.	V	P	K	S	M	
<i>Charaka Samhita</i>	<i>Chikitsa Sthana</i> - 16	5	+	+	+	+	+	
<i>Sushruta Samhita</i>	<i>Uttaratantra</i> - 44	4	+	+	+	+	-	
<i>Ashtanga Hridaya</i>	<i>Nidana Sthana</i> - 13 <i>Chikitsa Sthana</i> - 16	5	+	+	+	+	+	
<i>Ashtanga Samgraha</i>	<i>Nidana Sthana</i> - 13 <i>Chikitsaa Sthana</i> - 18	5	+	+	+	+	+	
<i>Harita Samhita</i>	<i>Tritiya Sthana</i> - 08	5	+	+	+	+	+	
<i>Bhavaprakasha</i>	<i>Madhyama Khanda</i> - 08	5	+	+	+	+	+	
<i>Kashyapa Samhita</i>	<i>Vedanadhyaya</i>	1	<i>Pandu</i>					

Involvement of *Doshas*

- Here the involvement of *Vata* and *Pitta Doshas* may be considered because inside the body *Vata Dosha* is the initiator of any changes, while the transformation or mutation caused by *Pitta Dosha*.
- Hence, in this condition *Vata* and *Pitta Doshas* are equally responsible for *Prakriti Vaipareetya* of *Dhatu*.

Prakriti of each *Dhatu* is maintained by *Kapha Dosha*.

- Changes in *Prakriti* denote *Shleshma Kshaya* tending to *Dhatu Vaipareetya*.
- So in the present context, the *Doshika* status of the disease may be analyzed as *Vata-Pitta* provocation along with depletion of *Kapha* resulting in various disorders.

Beeja-Dsoha

- SCD is also due to abnormality in *Beeja* (Sperm, Ovum and zygote), *Beejabhaga* (Chromosomes) and *Beejabhagavayava* (Gene locus: Promoter region, Exons, Introns).
- During embryonic devolvement abnormality is seen in that body part/component, which *Beeja* or *Beejabhaga* are affected by Vitiated *Dosha*.¹¹
- According to *Acharya Charaka*, defect in *Beeja*, *Atmakarma*, *Ashaya*, *Kala*, and *Matura Aahara*

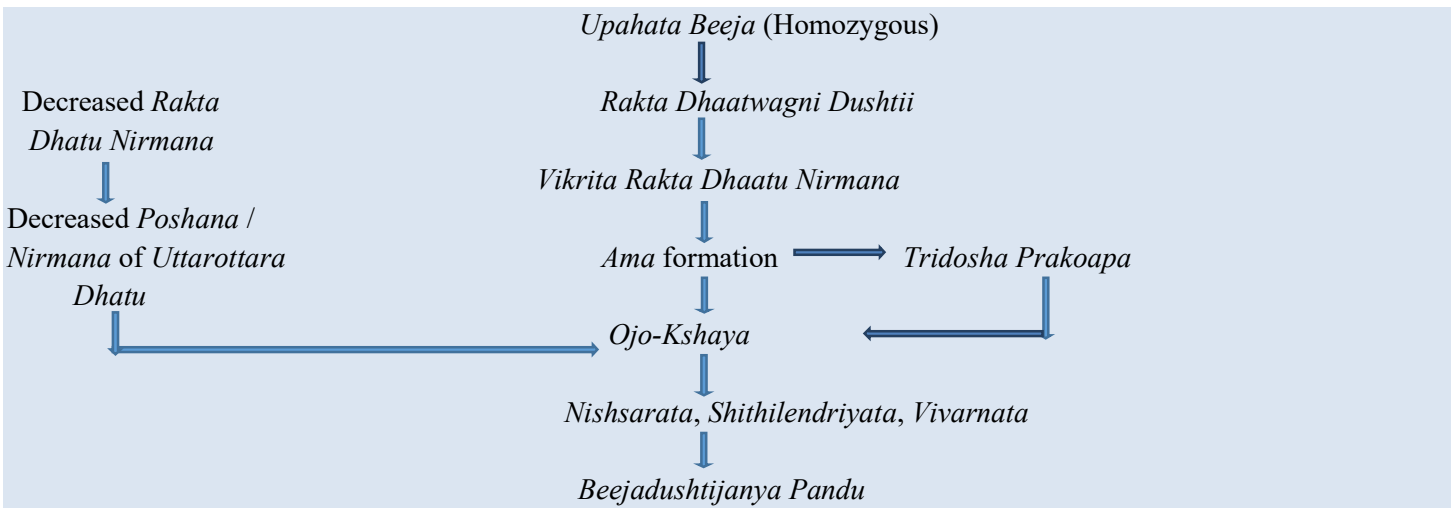
Vihara are responsible for defect in *Samsthana*, *Varna* and *Indriya* of the fetus.¹²

- In the context of *Sahaja Arsha*, he also mentioned that *Apachara* and purvakrita karma done by both the parents are responsible for *Beejopatapti*.¹³
- According to *Sushruta Naastikata* and *Ashubha karma* of parents, and *Vatadi Prakopa* are responsible for *Vikriti* in the *Garbha*.¹⁴
- The disturbances of these three *Dosha* by *Anuchita Ahara Vihara* and *purvajanmakrita karma* in the parents affect the next progeny.¹⁵

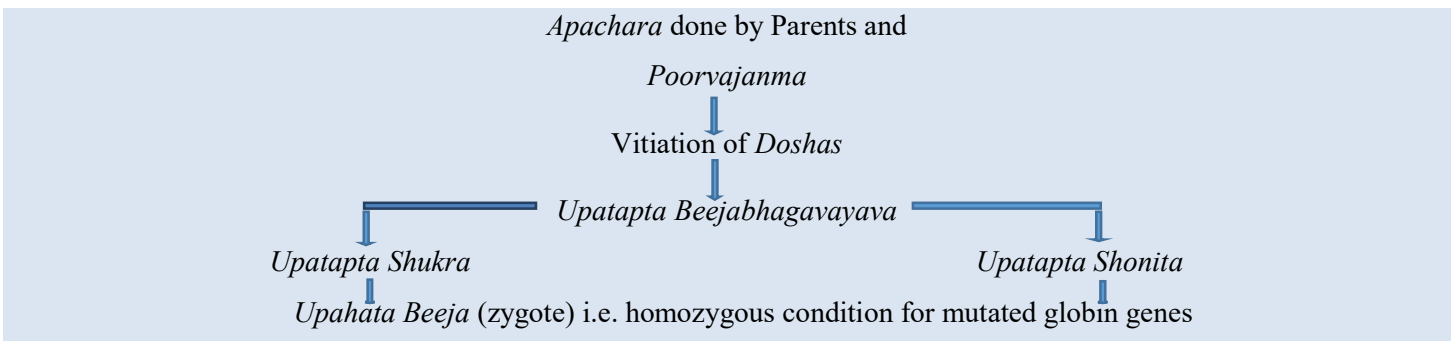
Table 2: Concept of *Beeja*, *Beejabhaga* and *Beejabhagavayava*

Terms in classics	Nearer terms in genetics
<i>Beeja</i>	Sperm, Ovum and zygote
<i>Beejabhaga</i>	Chromosomes
<i>Beejabhagavayava</i>	Gene locus: Promoter region, Exons, Introns

Samprapti of Beejadushtijanya Pandu



Possible Samprapti of Upahata Beeja



DISCUSSION

SCD is described in modern medical sciences in detailed, in *Ayurvedic* classics there are no any entity which may compare exactly with SCD, The genetical basis of SCD is well established. So *Beeja Dushtijanya Pandu/ Kulaja Pandu / Anuvamshika Pandu* may be some similarity with SCD. Here the involvement of *Vata* and *Pitta Doshas* can be considered because inside the body *Vata Dosha* is the initiator of any change, while the transformation or mutation caused by *Pitta Dosha*. Hence, in this condition *Vata* and *Pitta Doshas* are equally responsible for *Prakriti Vaipareetya* of *Dhatu*. *Prakriti* of each *Dhatu* is maintained by *Kapha Dosha*. Changes in *Prakriti* denote *Shleshma Kshaya* tending to *Dhatu Vaipareetya*. So in the present context, the *Doshika* status of the disease can be analyzed as *Vata-Pitta* provocation along with depletion of *Kapha*.

CONCLUSION

In this study Genetic basis of SCD and *Beejadushtijanya Pandu* has been proved from both modern and *Ayurvedic* point of view, Both shows similarity in pathogenesis and in some clinical presentation so it can be concluded that Sickle cell disease and *Beeja Dushtijanya Pandu/ Kulaja Pandu / Anuvamshika Pandu* appears to be appropriate for correlation.

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