A REVISED AYURVEDIC APPROACH TO SICKLE CELL DISEASE

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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.

Types of SCD
- Sickle cell anemia
- Sickle Hb C disease
- Sickle Beta plus thalassemia
- Sickle Beta zero thalassemia

Signs & Symptoms
- 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 factors
- Cold Environment

Sickle cell trait
- 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. Raktaalpata (Hemolytic anemia), Shithilendriya (fatigue), Aruchi (Anorexia), Hatanala (reduced digestive fire), Shwas (Acute Chest Syndrome - dyspnea), Arohana-Ayas, (tiredness on exertion), Pindwikadweshtana (stiffness and tightness in calf muscle) and Jwara (fever), Parvabheda (Arthritis like symptoms), Klama (tiredness on rest) 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

<table>
<thead>
<tr>
<th>Samhita</th>
<th>Description of Pandu</th>
<th>Types</th>
</tr>
</thead>
<tbody>
<tr>
<td>Charaka Samhita</td>
<td>Chikitsa Sthana - 16</td>
<td>5</td>
</tr>
<tr>
<td>Sushruta Samhita</td>
<td>Uttaratantra - 44</td>
<td>4</td>
</tr>
<tr>
<td>Ashtanga Hridaya</td>
<td>Nidana Sthana - 13</td>
<td>5</td>
</tr>
<tr>
<td>Ashtanga Samgraha</td>
<td>Nidana Sthana - 13</td>
<td>5</td>
</tr>
<tr>
<td>Harita Samhita</td>
<td>Triitiya Sthana - 08</td>
<td>5</td>
</tr>
<tr>
<td>Bhavaprakasha</td>
<td>Madhyama Khanda - 08</td>
<td>5</td>
</tr>
<tr>
<td>Kashyapa Samhita</td>
<td>Vedanadhyaya</td>
<td>1</td>
</tr>
</tbody>
</table>

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 provoked along with depletion of Kapha resulting in various disorders.
**Beeja-Dosha**

- 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**

<table>
<thead>
<tr>
<th>Terms in classics</th>
<th>Nearer terms in genetics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beeja</td>
<td>Sperm, Ovum and zygote</td>
</tr>
<tr>
<td>Beejabhaga</td>
<td>Chromosomes</td>
</tr>
<tr>
<td>Beejabhagavayava</td>
<td>Gene locus: Promoter region, Exons, Introns</td>
</tr>
</tbody>
</table>

**Samprapti of Beejadushtijanya Pandu**

<table>
<thead>
<tr>
<th>Decreased Rakta Dhatu Nirmana</th>
<th>Upahata Beeja (Homozygous)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Upahata Beeja (zygote) i.e. homozygous condition for mutated globin genes</td>
<td></td>
</tr>
<tr>
<td>Rakta Dhaatwagni Dushtii</td>
<td></td>
</tr>
<tr>
<td>Vikrita Rakta Dhaatu Nirmana</td>
<td></td>
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<tr>
<td>Ama formation</td>
<td></td>
</tr>
<tr>
<td>Ojo-Kshaya</td>
<td></td>
</tr>
<tr>
<td>Nishsarata, Shithilendriyata, Vivarnata</td>
<td></td>
</tr>
<tr>
<td>Beejadushtijanya Pandu</td>
<td></td>
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</tbody>
</table>

**Possible Samprapti of Upahata Beeja**

<table>
<thead>
<tr>
<th>Apachara done by Parents and</th>
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<tbody>
<tr>
<td>Poorvajanma</td>
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<tr>
<td>Vitiation of Doshas</td>
</tr>
<tr>
<td>Upatapta Beejabhagavayava</td>
</tr>
<tr>
<td>Upatapta Shukra</td>
</tr>
<tr>
<td>Upahata Beeja (zygote) i.e. homozygous condition for mutated globin genes</td>
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<tr>
<td>Upatapta Shonita</td>
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</tbody>
</table>
DISCUSSION

SCD is described in modern medical sciences in detail, in Ayurvedic classics there are no any entity which may compare exactly with SCD. The genetical basis of SCD is well established. So Beeja Dushitijanya 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 Dushitijanya Pandu/ Kulaja Pandu / Anuvamshika Pandu appears to be appropriate for correlation.

REFERENCES

1. https://www.nhlbi.nih.gov/sickle cell anemia dated 03/06/2017
2. https://www.nhlbi.nih.gov/sickle cell anemia dated 03/06/2017
3. www.healthline.com/sickle cell disease dated 03/06/2017
4. www.healthline.com/sickle cell disease dated 03/06/2017
5. https://www.tapgenes.com/sickle cell disease dated 03/06/2017
6. https://en.m.wikipedia.org/sickle cell trait dated 03/06/2017

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