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ROLE OF BASTI CHIKITSA AS WHOLESOME AND RATIONAL TREATMENT IN CHILDHOOD SICKLE CELL ANEMIA

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ABSTARCT

Background: Sickle Cell Anemia (SCA) is a genetic disorder with heterogeneous autosomal recessive inheritance. Prevalence rate in India ranging from 18%-44% in different part of the country. Anemia, fatigue, loss of appetite, recurrent episodes of arthralgia especially small joints of phalanges is the classical features of SCA with wide range of pain to sever crisis. **Aim**: To discuss the role of *Basti Chikitsa* (*Ayurveda Panchkarma*) as palliative care in SCA. **Methodology**: Detailed review on childhood SCA with available literature has been done. Analysis of treatment protocol of different patients of SCA in Parul Ayurveda Hospital (PAH), Vadodara Gujarat was done. Reviewing of different research article were done for preparation of this manuscript. **Discussion:** SCA can be categorized under the domain of *Pandu Roga* in *Ayurveda* literatures. *Pandu* in *Ayurveda* is the disease of *Rasa* and *RaktaDhatu* (Lymph, and blood). Different features of SCA resembles with the *Rasa-Rakta Kshaya*(lack of blood and its component) and can be corrected with the proper nourishment of these two *Dhatu*. There are many different treatments to improve the *Rasa-Rakta Dhatu Poshana*. *Basti Chikitsa i*s one of the best Ayurveda treatments is found be useful in improving the metabolism and nutrition of the *Rasa-Rakta Dhatu*. Different Basti is found to be primary and effective treatment in the management of SCA as palliative care in our observation at PAH. This article is an attempt to highlight the role of *Basti Chikitsa* in childhood SCA.

Keywords: ***Basti, Panchkarma, Pandu, Rasa-RaktaKshaya, Sickle cell anemia***

INTRODUCTION:

Sickle Cell Anemia (SCA) is a genetic disorder with heterogeneous autosomal recessive inheritance. Prevalence rate in India ranging from 18%-44% in different part of the country **[1]**. Anemia, fatigue, loss of appetite, recurrent episodes of arthralgia especially small joints of phalanges is the classical features of SCA **[2]** with wide range of pain to sever crisis **[3]**. As it is a genetic disorder, there is no direct medical management for cure of disease, nevertheless there is palliative care of disease has been evolved in last decade. Considering the wide range of symptoms due to difference in gene expression proportion, researchers are in search of the newer treatment protocol. Sickle Cell Disease (SCD) is a term used for a group of a genetic disorder characterised by production of haemoglobin (Hb)S. It is a result of single base pair change, thymine for adenine at 6^{th} position on beta –globin gene on chromosome no. 11 replacing Valine for Glutamic acid. The substitution of single amino acid is responsible for profound change in molecular stability and solubility of haemoglobin "S". The term SCD includes several distinct genotypes **[4]**. Due to the presence of Hb-S and because of its abnormal characteristic, normal RBCs is converted into rigid-brittle Sickle shaped instead of soft round biconcave shape, which is the main cause of complication of Sickle Cell disease **[5]**. The rigidity and abnormal shape reduce their ability to be propelled through tiny capillaries leading to the formation of entangled masses of cells in blood vessels. This obstructs the blood flow into organs, producing temporary or permanent organ dysfunction. Because of their abnormal shape, the spleen in the body destroys these RBCs, causing enlargement of spleen. Life span of RBC in SCD is less than 30 days instead of 90 to 120 days. Anemia results from the bone marrow's inability to produce enough blood cells to keep pace with the rate of destruction **[6]**.

CONVENTIONAL MANAGEMENT OF SCA:

Role of hydroxyurea (hou) in sca [7]: The pharmaceutical mode of action of HoU is studied in detailed since last decades. The most important mechanism of action is inhibition of ribonucleotide reductase (RR), the enzyme involved in transforming ribonucleosides into deoxyribonucleosides that serve as building blocks for DNA synthesis. Hydroxyurea is a potent RR inhibitor that reduces intracellular deoxynucleotide triphosphate pools and acts as an S-phase-specific agent with inhibition of DNA synthesis and eventual cellular cytotoxicity. Presumably with once-daily dosing in SCA, hydroxyurea causes intermittent cytotoxic suppression of erythroid progenitors and cell stress

signalling, which then affects erythropoiesis kinetics and physiology and leads to recruitment of erythroid progenitors with increased HbF levels. A remarkable attribute of hydroxyurea is the observation that treatment has multiple potential benefits for patients with SCA. Beyond HbF induction, the cytotoxic effects of hydroxyurea also reduce marrow production of neutrophils, reticulocytes and also reduce no of platelets which is an important mediator of inflammation. Because an elevated WBC has been associated with both morbidity and mortality of SCA lowering the WBC count in SCA is itself potentially therapeutic. Both neutrophils and reticulocytes promote vaso-occlusion through vascular adhesion; hydroxyurea lowers their absolute numbers and reduces surface expression of adhesion receptors **[8]**. Additional benefits of hydroxyurea treatment include salutary effects on the circulating erythrocytes. A frequently observed effect of hydroxyurea treatment is an elevated mean corpuscular volume, despite reduced reticulocytotic. Peripheral erythrocytes undergo numerous morphologic and physiologic changes during hydroxyurea dose escalation to maximum tolerated dose (MTD), including macrocytosis, increased mean corpuscular haemoglobin, better hydration, more targeting, less haemolysis, and fewer sickled forms. Overall blood flow is improved, with a higher haemoglobin concentration and lower LDH and bilirubin levels. Finally, the hydroxyurea molecule contains an NO moiety that can be released directly through unknown metabolic processes. NO has beneficial effects on vascular endothelium, including local vasodilatation, and could help offset proposed haemolysis-related NO consumption. This effect may help explain the clinical improvement some patients feel soon after initiating hydroxyurea treatment, before reaching MTD with maximal HbF induction.

Need of study for alternative medicine for childhood SCA:

After critical analysis of the mode of action of HoU, it is clear that, though it is helpful to control the pathogenesis and consequences of RBCs and sickling, it has detrimental effect on the physiology of the hemopoietic system and immune system of those children. Additional side effects lead to poor growth promotion in these children. Considering this fact its need of hour to define the wholesome and rational remedies for childhood SCA to promote their growth and quality of life along with the palliation of the symptoms of Sickle cell disease.

SICKLE CELL ANAEMIA AND *AYURVEDA*

In *Ayurveda* no any disease entity which directly correlated with Sickle Cell Anaemia but the signs and symptoms of *Pandu Roga* and symptoms explained in *Rasa-Rakta*

Kshaya resembles the features of sickle cell anaemia in children. In this article Sickle Cell Anaemia is correlated with the *Pandu* and *Rasa-Rakta Kshaya* and with this correlation the role of *Panchakarma* as a palliative care in the management of Sickle Cell Anaemia in children has been established. The correlation is based on the clinical observations and literature-based knowledge.

Table 1: Correlation of Symptoms of Sickle Cell Anemia with *Pandu Roga* and *Rasa-Rakta Kshaya*

Symptoms of SCA	*Pandu*	*Rasa-Rakta Kshaya Lakshana*
Pallor	*Panduta*	*Raktaalpata*
Fatigue	*Daurbalya*	*Klama*
Leg cramps	*Pindikodweshtana*	*Sira-shaithilya, Sunyata*
Growth retardation	*Karshya*	*Shosha*
Recurrent Illness	*Sadaaatura*	*Kshaya*

***PANDU* IN CHILDREN [9]:** There is no exclusive description of *Pandu Roga* in children in *Ayurveda* classics. The clinical features of *Pandu Roga* in adult are taken into consideration to describe the *Pandu Roga* in children. In addition, *Acharya Kashyapa* defines the *Pandu* in children under *Vedana Adhyaya* **[10]**. In anaemia there is swelling around umbilicus, whiteness of eyes, deformity of nails, loss of appetite and swelling in both eye-pits **[11]**. This condition occurred in the children with Sickle Cell Anaemia and hence the correlation of Sickle Cell Anaemia has been made by different scholars of Ayurveda. As most of the symptoms of *Pandu* **[12]** and sickle cell anaemia are due to *Rasa-Rakta Dhatu Kshaya* and hence the pathophysiology and treatment principle are move around the nourishment and purity of *Rasa-Rakta Dhatu.*

***PANCHKARMA* IN SICKLE CELL ANEMIA:** *Ayurveda* describes the treatment of diseases in two broad senses as *Samshodhana* and *Samshamana Chikitsa* **[13]**. Among which *Samshodhana* is known as *Panchakarma* **[14]**. *Panchakarma* should be applied as palliative care to improve the quality of life of children with the Sickle Cell Anaemia.

Panchakarma procedures like *Basti* is found to be beneficial in the palliative care of SCA in children.

***BASTI* IN CHILDREN [15]**

It is the procedure where the medicines in colloidal solution form are administered through anal tract using *Bastiyantra* (Specific apparatus). Among all therapeutic procedures, *Basti* is superior because it is like *Amruta* (nectar) in child patient and the most appropriate remedial measure for *Vata Dosha* **[16]**. *Basti* is best indicated for the child and told that it imparts *Ārogya* to the child, offspring for parents and name and the fame for the Doctor, and considered as nectar for the child **[17]**.

Procedure: [18] The patient is advised to lie down in left lateral position. Small

amount of oil is applied on patient's anus and *Basti netra.* The *Basti netra* (nozzle) is gently inserted into the anal canal up to a specific length and *Basti Putaka* containing mixture (*Basti Dravya)* is pressed with a uniform pressure. The pressure is continued till only small quantity of fluid remains in the bag to avoid air insertion. Then the nozzle is removed gently and the patient is allowed to lie down on supine position till he feels urge to excrete. The maximum time specified for retention of *Basti dravya* is 48 minutes. After evacuation of the bowel; the patient may take hot water bath and take congenial diet like Rice with gruel of green gram.

These are: (as per *Kashyapa*) **[19]**

• *Karma Basti* 30 in number (6 *Niruha*, 24 *Sneha*)

• *Kala Basti* 15 in number (3 *Niruha*, 12 *Sneha)*

• *Yoga Basti* 8 in number (3 *Niruha*, 5 *Sneha*)

• *Chturbhadra kalpa*12 in number (4 *Sneha* + 4 *Niruha* +4 *Sneha)*

DISCUSSION:

Ayurveda treatment modalities are more focused on the concept of *Dhatu Samya* means to improve the nourishment and functions of tissues and organs and improve the disease resisting capacity of the body. In addition, there is treatment like *Panchakarma* which improves the basic metabolism of an individual for formation of healthy *Dhatu* (tissues). *Basti* is one among *Panchakarma* use to improve the health of all *Dhatu, Avayava* and imparts the health and immunity to individual additionally it acts on *Marma Sthana* (Vital Organs) and improves the vitality of individual. Despite the part of *Panchakarma; Basti* have some advantages of like it is useful as *Samshamana* as well as *Samshodhana* and hence it is useful in children safely.

ROLE OF *BASTI* IN SICKLE CELL ANEMIA: After considering the pathophysiology of Sickle cell Anaemia from *Ayurveda* perspective it is very clear that*, Basti* plays very important role in reliving the symptoms of sickle cell anaemia and are useful to give strength to *Rasa-Rakta Dhatu* which gives strength and immunity to child in turn gives good quality of life to the children with sickle cell anaemia.

दत्तस्तु प्रथमो बस्तिः स्नेहयेद्वस्तिवङ्क्षणौ ।। ७१ ।।

[20]

सम्यग्दत्तो द्वितीयस्तु मूर्धस्थमनिलं जयेत् । जनये द्बलवर्णौ च तृतीयस्तु प्रयोजितः ।। ७२ ।।

रसं चतुर्थो रक्तं तु पञ्चमः स्नेहयेत्तथा । षष्ठस्तु स्ने हयेन्मांसं मेदः सप्तम एव च ।। ७३ ।।

अष्टमो नवमश्चास्थि मज्जानं च यथाक्रमम् । एवं शुक्रगतान् दोषान् द्विगुणः साधु साधयेत् ।।

(सु. चि. ३७/ ७१-७३)

Acharya Sushruta has mentioned in *Anuvasana Uttara Basti Chikitsa Adhyaya* that the first application of the *basti*

permeates the pelvic and the inguinal regions with the emulcent essence of the injected *Sneha*. The second tends to restore the *Vayu* in the cephalic part of the body to its normal condition. The third contributes to the improvement of bodily strength and complexion. The fourth permeates the *Rasa* with its own oily essence. In this way the fifth application of a *basti* permeates the blood (*Rakta*), the sixth the flesh (*Mamsa*), the seventh the fat (*Meda*), the eighth the bone (*Asthi*) and the ninth the marrow (*Majja*) with the oily essence. This series of *Basti* applications repeated twice tends to purify the semen from all its impure or unhealthy constituents.

If one analyses this versus of *Ayurveda* classical text *Sushruta Samhita*, one can understand the wide and broad-spectrum therapeutic effect of *Basti* therapy.

In sickle cell anemia there is *Rasa and Rakta Kshaya* and treatment should be targeted to improve the nourishment of *Rasa* and *Rakta Dhatu* in qualitative as well as quantitative manner. With the use of different medicines and different *Basti Yoga* mention in the *Ayuevda* classical texts improvement in the *Rasa-Rakta Dhatu* can be done to improve the Quality of Life of the children with SCA.

Following *Yapana Basti* mentioned in *Ayurveda* Classics like *Charaka Samhita, Kashyapa Samhita* and *Sushruta Samhita* etc are useful for palliative care in SCA.

- *KshiraYapana Basti*
- *Mustadi Rajayapana Basti*
- *Hapushyadya Yapana Basti*
- *Erandamooladi Yapana Basti*
- *Punarnavadi Yapana Basti*
- *Madhutailika Yapana Basti*

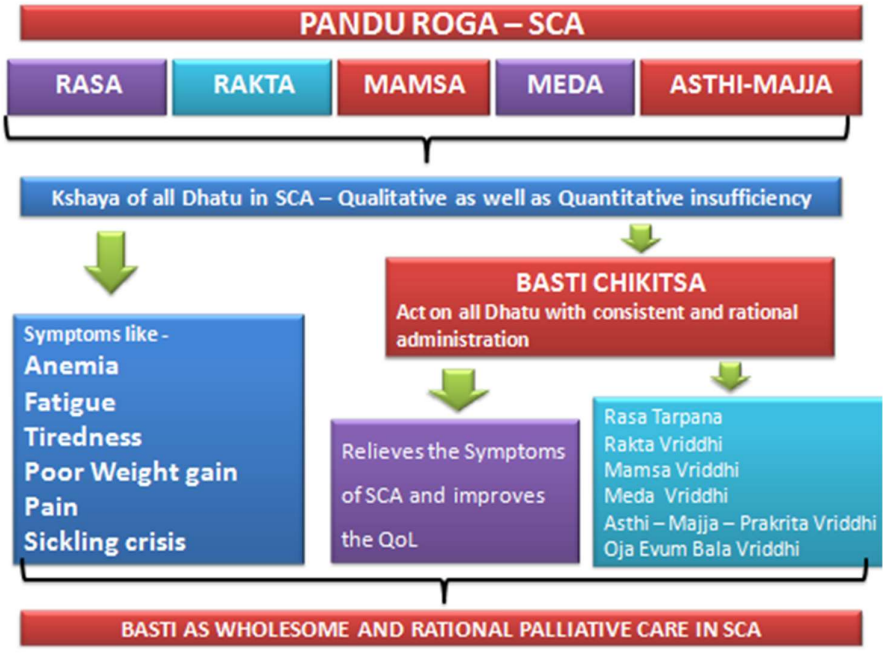

Figure 1: Role Of *Basti Chikitsa* In Sca – At Glance

CONCLUSION:

There is definite role of *Basti Chikitsa* as palliative care in the SCA to improve the qualitative as well as quantitative nutrition of all tissues and Dhatu in childhood SCA.

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