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## SICKLE CELL ANAEMIA IN CHILDREN: AN AYURVEDIC APPROACH: A CASE STUDY

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### ABSTRACT

Red blood cell abnormalities that are inherited (autosomal recessive) are referred to as sickle cell disease (SCD). An abnormal sickle-cell or haemoglobin-S level causes sickle cell anaemia. The prevalence of this disease is quite high among members of tribal communities of southern-east Gujarat. The tribal community makes up roughly 18 crores of India's population, and of those, 1.8 crores and 14 lakhs are anticipated to have sickle cell trait and sickle cell disease. Children's quality of life is challenging due to its chronic nature and unpleasant crisis. The only remaining option is a successful bone marrow transplant moving forward. Its signs and the disease's nature are comparable to Pandu in Ayurveda classics. The drug and associated work will be advantageous to society if it enhances patient health and quality of life. **Case report** - A 12-year-old female patient was diagnosed with sickle cell anaemia. Symptoms included severe pain in the limbs, joint pain, fatigue, body aches, weakness, anorexia, pallor ++, and loss of appetite, approached the OPD, department of Kaumarbhritya, Parul Institute of Ayurved, Vadodara. The patient is taking modern medicine (5 mg folic acid once a day). The child's parents visit Parul Ayurved Hospital for Ayurveda treatment with their consent. During the period of treatment of integrative medicine, patient did not experience a pain crisis. The quality of life of a patient is also improved. The goal of this case study is to explore the potential of Ayurveda medicines in the management of Sickle cell anaemia and mainstreaming it with today's conventional practices.

**Keywords:** Sickle cell anaemia, *Pandu*, *Bijadustijanya*, *Dadimadi Avaleha*

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## 1. INTRODUCTION

Sickle cell disease, also known as Sickle cell anaemia, is a hereditary condition that damages haemoglobin and is common among some tribal tribes in India [1-6]. As an autosomal recessive condition, it is passed on. This is the outcome of valine being changed to glutamate and adenine being changed to base pair 6 of the  $\beta$ -globin gene on chromosome 11. Numerous health issues, including pain episodes, anaemia, bacterial infections, hand and foot oedema, and strokes, can occur in Sickle cell disease (SCD). Four types of sickle cell crisis are recognized: Aplastic crisis, vascular occlusive crisis, pain crisis, and sequestration crisis. It can be related to *Pandu Vyadhi* under the category of *Adibala Pavarutta Vyadhi* by taking into account the symptomatology and type of the illness. The disease is *Asadhya* in nature, as evidenced by its chronicity. Paleness, also known as *Panduta*, is a key indicator of *Pandu Roga*. The most typical signs and symptoms are paleness, agitation, weakness, malaise, headache, etc. Consuming unwholesome foods (hot, sour, salty, and greasy food items) and engaging in unwholesome behaviours (daytime sleep, stifling natural desires, and physical activity while food is being digested) are the two main causes of *Pandu Roga*. If a drug maintains a patient's health and enhances their quality of life, then those drugs and efforts may be useful to

society as a whole. In *Charak Samhita Dadimadi Ghrita* is advised in treatment of *Pandu Rog* [7-15].

### 2.1. CASE HISTORY

A 12-year-old female Hindu patient with sickle cell anaemia presented to the OPD of Kaumarbhritya of Parul Ayurved Hospital Vadodara Gujarat, with symptoms including persistently severe pain in the limbs, current joint pain, fatigue, body aches, weakness, anorexia, increased pallor and loss of appetite.

### 2.2. PRESENT HISTORY

The patient is experiencing joint discomfort, upper and lower limb pain, anorexia, fatigue, body aches, headaches, weakness, and loss of appetite. Pallor (Grade 3) and icterus (Grade 3) upon physical examination.

### 2.3. PAST HISTORY

Patient had been admitted 3 times in Parul Sevaasharam hospital since 2018. PCV transfusion was given. Then admit in February 2022 for sickle cell crises and again admit in June 2022 for lower respiratory tract infection (LRTI). Suggestive of recurrent illness and admission in hospitals due to low immunity as well as haemolytic crisis.

### 2.4. BIRTH HISTORY

No major medical intervention was required during prenatal, natal, postnatal periods. Immunization was done as per the national schedule.

## 2.5. PERSONAL HISTORY

*Aharaja*: Vegetarian and with a poor appetite.

*Viharaja*: The patient enjoys playing outdoor games with friends but was unable to do so because of exhaustion. Also disrupted in sleep.

## 2.6 EXAMINATION

Vitals were within normal range before the treatment (Table 1). No abnormality was

found in cardiovascular system, respiratory system and per abdomen examination.

## 2.7 ASHTAVIDHA PARIKSHA

*Ashtavidha parikshan* is given in Table 2.

## 2.8 DASVIDHA PARIKSHA

*Dasvidha parikshan* is given in Table 3.

## 2.9 INVESTIGATION

Blood investigation was done. Values are given in Table 4.

## EXAMINATION

Table 1: Before and after treatment vitals

Vitals	BT	AT
Temperature	97.6	97.2
Pulse rate	84	80
Respiratory rate	20	22
Blood pressure	100/60 mm hg	110/70 mm hg
Spo2	98%	98%
Weight	36 kg	40kg
Height	119cm	119.6cm

Table 2: Ashtavidha Pariksha

ASHTAVIDH PARIKSHA	BT	AT
Nadi	Vata-pitta	Vata pitta
Mala	Constipation	Once a day
Mutra	Normal	Normal
Jihva	Sama	Normal
Shabda	Normal	Normal
Sparsha	Pain in joint	No any tenderness
Drika	Pallor ++, icterus +	No pallor, no icterus
Akriti	Weakness	Good

Table 3: Dasvidha Pariksha

DASVIDHA PARIKSHA	BT	AT
Prakriti	Vata pitta	Vata pitta
Sara	Avar	Madhyama
Samhanana	Avar	Madhyama
Satva	Avar	Avara
Pramana	Avar	Madhyama
Satmya	Madhyama	Madhyama
Ahar shakti	Avar	Madhyam
Vyayama shakti	Avar	Madhyama

Table 4: Investigation

INVESTIGATION	BT	AT
Haemoglobin	8.8 g/dl	10 .3 g/dl
RBC count	3.59million/ microl	3.80million/ microl
MCV	72.5f1	78.5f1
MCH	24.3Pg	29.4Pg
MCHC	23.9gm/dl	27.5gm/dl
WBC COUNT	11230/cmm	7500/cmm
PLATELET COUNT	558000/cmm	179000/cmm

## Treatment Protocol

TOTAL DURATION	60 DAYS
DRUG	DADIMADI AVLEHA
DOSE	20 gm BD before food Anupan – Luke warm water.

Table 5: Contents of Dadimadi avaleha

No.	Drug	Latin name	Quantity
1	Dadima	<i>Punica grantum</i> Linn.	8 parts
2	Pippali	<i>Piper longum</i> Linn.	1 part
3	Dhanyaka	<i>Coridum sativum</i> Linn.	4 parts
4	Shunthi	<i>Zingiber officinale</i> Rosc.	2 parts
5	Chitraka	<i>Plumbago zeylanica</i> Linn.	2 parts
6	Ghee	Cow ghee	QS
7	Sharkara	Sugar	60% w/v

## 3. RESULT AND DISCUSSION: -

## Grading:

<i>Pallor</i>	0	No pallor
	1	Pallor of conjunctiva
	2	Pallor of conjunctiva, nails and tongue
	3	Pallor of conjunctiva, nails, tongue and skin
	4	Pallor of conjunctiva, nails, tongue, palm and soles
Limb pain	0	No pain

	1	Pain in only one extremity
	2	Pain in both extremities
	3	Involvement of almost all bone
Anorexia	0	No anorexia
	1	Eating a typical diet without any interest
	2	Eating without interest and constantly unable to finish
	3	No interest in taking food, resisting or crying while feeding
Loss of appetite	0	Eating in excellent quantity twice or three times per day
	1	Eating normally twice per day
	2	Eating moderately twice per day
	3	Eating less than usual twice per day
	4	Eating once's per day
	5	Not at all taking food
Fatigue	0	Normal active child
	1	Limited play and activities
	2	Feeling tiredness while playing
	3	Easy fatigability while playing

Quality of life Assessment (WHO QOL parameters)**A. General Assessment**

1. How satisfied are you with your health?

1= very dissatisfied

2= Dissatisfied

3= Neither satisfied nor dissatisfied

4= Satisfied

5= Very satisfied

2. How would you rate your quality of life?

1 = Very

2 = poor

3 = Neither poor nor good,

4 = Good

5 = Very good

3. How satisfied are you with your sleep?

1= Very dissatisfied

2= Dissatisfied

3= Neither satisfied nor dissatisfied

4= Satisfied

5= Very satisfied

**B. Physical Assessment**

4. How satisfied are you with the way your body looks

1= Very dissatisfied

2= Dissatisfied

3= Neither satisfied nor dissatisfied

4= Satisfied

5= Very satisfied

5. Do you have enough energy for everyday life?

1=Not at all

2=A little

3=Moderately

4=Mostly

5=Completely

6. How satisfied are you with your ability to perform your daily living activities?

1= Very dissatisfied

2= Dissatisfied

3= Neither satisfied nor dissatisfied

4= Satisfied

5= Very satisfied

7. Didn't do work or other activities as carefully as usual?

1=Not at all

2=A little

3=Moderately

4=Mostly

5=Completely

### C. Psychological Assessment

8. Did you feel very nervous?

1=Not at all

2=A little,

3=A moderate

4= very much

5=An extreme amount

9. Have you felt so down in the dumps, nothing could cheer you up?

1=Not at all

2=A little

3=A moderate amount

4=Very much

5=An extreme amount

10. Have you been very happy?

1=Not at all

2=A little

3=A moderate amount

4=Very much

5=An extreme amount

11. How much do you enjoy life?

1=Not at all,

2=A little

3=A moderate amount

4=Very much

5=An extreme amount

### D. Social Assessment

12. Do you feel happy about your relationship with your family members?

1 = very unhappy

2 = unhappy,

3 = Neither happy nor unhappy

4 = happy

5 = very happy

13. How satisfied are you with your friends?

1=Not at all

2=A little

3=A moderate amount

4=Very much

5=An extreme amount.

14. How satisfied are you with your study?

1=Not at all

2=A little

3=A moderate amount

4=Very much

5=An extreme amount

### E. Environment Assessment

15. How satisfied are you with your physical environment (e.g., pollution, climate, noise, attractiveness)?

1= Very dissatisfied

2= Dissatisfied

3= Neither satisfied nor dissatisfied,

4= Satisfied

5= Very satisfied

16. Have you enough facility to meet your needs?

1=Not at all

2=A little

3=A moderate amount

4=Very much

5=An extreme amount

17. How satisfied are you with the conditions of your living place?

1=Not at all

2=A little

3=A moderate amount

4=Very much

5=An extreme amount

18. How much concern do people show in what you are doing?

1=A lot of concern and interest=5

2=Some concern and interest=4

3=Uncertain=3

4=Little concern and interest=2

5=No concern and interest=1

19. How easy is it to get practical help from friends if you should need it?

5=Very easy

4=Easy

3=Possible,

2=Difficult

1=Very difficult

### QOL Assessment-

The WHO quality of life assessment serves as the basis for the quality-of-life evaluation standards. Because sickle cell anaemia also affects the patient's quality of life, it is crucial for these patients to enhance their quality of life. For this reason, the assessment was conducted to determine how the *Dadimadi Avaleha* will affect the patient's quality of life. Before and after therapy assessments were conducted, and

the scores for improvement were then compared. *Dadimadi Avaleha's* objective criteria (Hb, PCV, MCV, MCH, MCHC, and RBC) have significantly improved. A rise in the mean was seen during the intervention period, according to the results of the Hb% evaluation. A patient's quality of life is also properties. Improved appetite is a result of increased activity, playfulness, and attention.

### Effect of therapy

Complain	Before treatment	After treatment
Pallor	2	0
Pain in limb	2	0
Anorexia	3	0
Fatigue	3	1
Loss of appetite	4	2
Weight	36kg	39kg

### Effects of QOF parameters

QOL parameters	Before treatment (Total score)	After treatment (Total score)
General assessment	9	11
Physical assessment	8	13
Psychological assessment	9	10
Social assessment	9	10
Environmental assessment	15	13

All of the major symptoms of Pandu, including pallor, anorexia, discomfort in the limbs, fever, periorbital edema, were treated with *Dadimadi Avaleha's* assistance. *Dadimadi Avaleha* has ingredients such as *Chitraka*, *Dhanyaka*, and *Shunthi Pippali*, which are *Dipana* (carminatives) and *Pachana* (like drug Pippali) detoxify the body by removing ama toxins. It enhances digestion and lowers the buildup of bad cholesterol in the body, which helps the

body lose weight more quickly and establishes sufficient nutrition for all Dhatu, which is advantageous for Dhatu poshana. With their antioxidant properties, *Dadima*, *Dhanyaka*, and *Shunthi* help lessen sickle cell oxidative stress and ward off sickle cell anaemia and SCA screaming [16, 17]. *Pachana* and *Dipana* remedies help repair the body's damaged Dosh or Aama while also enhancing digestion. hemopoietic action of the *Chitraka* which stimulates

the hemopoiesis and production of healthy RBCs in the children with sickle cell anaemia [18]. *Dhanyaka* treats the painful symptoms of sickle cell anaemia that cause sleep disturbances [19]. The improvement in objective criteria (Hb, PCV, MCV, MCH, MCHC AND RBC) have been met by *dadimadi* Avaleha. A rise in the mean was seen during the intervention period, according to the results of the Hb% evaluation. Additionally, a patient's quality of life is enhanced. The nutritional status and overall health of youngsters can be enhanced by *Dadimadi Avaleha's* beneficial properties. There has been an improvement in irritation, increased activity, playfulness, and concentration.

## CONCLUSION

With consequences like *Agnimandya* (both *Jatharagni* and *Dhatwagni*), *Panduta*, *Nisarata*, and *Kshaya* of Dhatus, *Bijadustijanya* is the primary cause of the illness. The subsequent development of *Tridosha Prakopa*, *Aama* generation (premature RBC destruction), and *Dhatu Shaya* worsen the disease's overall course. This case is a manifestation of a vascular occlusive crisis. no splenomegaly was seen. The child was treated with Ayurvedic medicine. Weight, pallor, discomfort, and other symptoms have all improved, importantly hematological indices and quality of life parameters show significant improving trend.

## Adverse drug reaction

No any adverse drug's reaction found.

## Key message

Children with sickle cell anaemia have high morbidity and mortality rates. The painful crisis and chronic nature have an impact on life quality. Their quality of life, hematological indices can be enhanced by ayurvedic drugs.

**Conflict of Interest:** None

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## REFERENCES

- [1] Ghai OP, Essential paediatrics. ninth edition; CBS Publication;2019.342p
- [2] Ram Bhartendu Shukla Et Al: Sickle Cell Disease- An Ayurvedic Perspective. International Ayurvedic Medical Journal {online} 2017 {cited March, 2017}
- [3] Pandit Kashinath pandey, Dr. Gorakhnath Chaturvedi. Charak samhita of Acharya Agnivesha.1st edition. Varanasi; Chaukhamba orientalia publishers; chikitsa sthan adhyaya-16/45-46p.
- [4] IAP Textbook of Pediatrics 4<sup>th</sup> Edition.

- [5] An Ayurvedic Management of Sickle Cell Anaemia in Children: A case study Akriti Gupta, Swapnil Raskar.
- [6] Tilak JC, Adhikari S, Devasagayam TP. Antioxidant properties of *Plumbago zeylanica*, an Indian medicinal plant and its active ingredient, plumbagin. *Redox Rep.* 2004;9(4):219-27. doi: 10.1179/135100004225005976. PMID: 15479566.
- [7] [https://www.researchgate.net/publication/235672010\\_Phytochemistry\\_pharmacology\\_and\\_medicinal\\_properties\\_of\\_Coriandrum\\_sativum](https://www.researchgate.net/publication/235672010_Phytochemistry_pharmacology_and_medicinal_properties_of_Coriandrum_sativum)
- [8] Belcher JD, Marker PH, Weber JP, Hebbel RP, Vercellotti GM. Activated monocytes in sickle cell disease: potential role in the activation of vascular endothelium and vaso-occlusion. *Blood.* 2000 Oct 1;96(7):2451-9. PMID: 11001897.
- [9] Sanjivani Shekoker and Chanchal Thombare 2019. A Phytopharmacological Review of Dadim- *Punica granatum* Linn. *International Journal of Ayurveda and Pharma Research.* 7, 4 (Jul. 2019), 21-31.
- [10] Rahimi HR, Arastoo M, Ostad SN. A Comprehensive Review of *Punica granatum* (Pomegranate) Properties in Toxicological, Pharmacological, Cellular and Molecular Biology Researches. *Iran J Pharm Res.* 2012 Spring;11(2):385-400. PMID: 24250463; PMCID: PMC3832175.
- [11] Zhang D, Xu C, Manwani D, Frenette PS. Neutrophils, platelets, and inflammatory pathways at the nexus of sickle cell disease pathophysiology. *Blood.* 2016 Feb 18;127(7):801-9. doi: 10.1182/blood-2015-09-618538. Epub 2016 Jan 12. PMID: 26758915; PMCID: PMC4760086.
- [12] Atul Desai, Kavita Desai, Hemshree Desai, Rutvij Desai, & Chirag Desai. (2022). Clinical Evaluation of T-AYU-HM Premium in Sickle cell Anemia Patients: A Retrospective Study.
- [13] Biswas P, Ghorai M, Mishra T, *et al.* Piper longum L.: A comprehensive review on traditional uses, phytochemistry, pharmacology, and health-promoting activities. *Phytotherapy Research: PTR.* 2022 Dec;36(12):4425-4476. DOI: 10.1002/ptr.7649. PMID: 36256521.
- [14] Pandey A, Kaur H, Borah S, *et al.* A systematic review on hydroxyurea therapy for sickle cell disease in India. *Indian J Med Res.*

2022;156(2):299-311.

doi:10.4103/ijmr.ijmr\_3447\_21.

- [15] Dixit R, Nettem S, Madan SS, et al. Folate supplementation in people with sickle cell disease. *Cochrane Database Syst Rev*. 2018;3(3):CD011130. Published 2018 Mar 16. doi:10.1002/14651858.CD011130.pub3
- [16] Agrawal RK, Patel RK, Shah V, Nainiwal L, Trivedi B. Hydroxyurea in sickle cell disease: drug review. *Indian J Hematol Blood Transfus*. 2014;30(2):91-96. doi:10.1007/s12288-013-0261-4
- [17] Ameh SJ, Tarfa FD, Ebeshi BU. Traditional herbal management of sickle cell anemia: lessons from Nigeria. *Anemia*. 2012;2012:607436. doi:10.1155/2012/607436
- [18] Anitha H, Mr P, Toshikhane H, Mathad P. Research study on biodegradation of antibiotics by herbal and mineral drugs
- [19] Kumar A, Garai AK. A clinical study on Pandu Roga, iron deficiency anemia, with Trikatrayadi Lauha suspension in children. *J Ayurveda Integr Med*. 2012;3(4):215-222. doi:10.4103/0975-9476.104446