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CLINICAL PROFILE OF CHILDREN WITH THALASSEMIA MAJOR AGED 5 TO 14 YEARS

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ABSTRACT

Background: Thalassemia is one of the commonest genetic disorders in India, causing children to be transfusion dependent. Despite high burden, there is delay in recognition, screening, diagnosis and adequate management, making study on their clinical profile a priority in Odisha. **Methodology**: This was a hospital based cross-sectional study done in SCBMCH and SVPPGIP, Cuttack during September 2019 to January 2020. Diagnosed cases of Thalassemia major patients aged 5 to 14 years, on blood transfusion were included in the study and those with other hemoglobinopathies or chronic illness not attributed to thalassemia were excluded. The demographic and clinical characteristics of the patients noted and data analysed using SPSS and expressed in percentages. **Results**: Among the 200 patients studied, male to female ratio was 2.03, with mean age 7.9 years. 71.5% of the study population had malnutrition, with 39% having stunting and 21% having both stunting and wasting. The average pre-transfusion haemoglobin was 6.3g/dl, age at diagnosis of 53% was between 6 to 9 months. Most (66%) of the cases received blood transfusion at frequency of once a month. Majority (40%) had their ferritin values $\geq$2000 (average-2096.45 ng/ml).Fatigue (56%) and splenomegaly (97.5%) were the most common symptom and clinical finding seen. 79% and 63% had good compliance and good knowledge about the disease respectively. No mortality was seen in our population, though 3.5% had complications. **Conclusion**: Owing to the high prevalence, measures for early detection, prompt diagnosis and optimum management of thalassemia patients, with easy access to services and education of masses is the need of the hour.

KEYWORDS: Thalassemia, clinical profile, hemoglobinopathy.

INTRODUCTION

Among the various genetic disorders that have affected mankind, Thalassemia can be considered one of the oldest and commonest in the world. It is considered one of the major health challenges in the Mediterranean region, Southeast Asia, the Middle East and Indian subcontinent.[1,2,3]

Depending on the extent of defective synthesis of globin chain and the type and number of chains involved, clinical features of thalassemia vary. Thalassemia major is the most severe but commonest form, leading to severe anemia and patients are transfusion dependent. These patients eventually end up in heart failure, iron overload or early death in childhood, in absence of transfusion.[4]

Individuals with Beta-thalassemia major usually present with failure to thrive and progressive pallor requiring regular blood transfusions to survive, abdominal enlargement, caused by splenomegaly and the risk of developing iron overload related complications. Complications of iron overload include growth retardation and failure of sexual maturation. Late complications are cardiac (dilated myocardiopathy and pericarditis), hepatic (chronic hepatitis, fibrosis, and cirrhosis), endocrinal (resulting in diabetes mellitus and parathyroid, thyroid, pituitary and less commonly adrenal glands insufficiencies) and hypersplenism.[5,6,7]

Every year one-tenth of the world's thalassemic population are born in India.[8] The carrier rate for beta thalassemia gene ranges from 1% to 3% in southern and 3% to 15% in northern parts of India.[9,10,11] There is lack of prevention programs in India to contain the incidence of thalassemia births.

Odisha has a high burden of thalassemic patients and yet not many studies have been done to assess their quality of life. Keeping this in mind, this study would attempt to analyse the clinical profile of beta thalassemia major in children aged 5 to 14 years in Odisha.

MATERIALS AND METHODS

This study was a hospital based cross-sectional study done in a tertiary care hospital SCBMCH and SVPPGIP, Cuttack during the period of September 2019 to January 2020.

Inclusion Criteria

1. Diagnosed case of beta thalassemia by High performance Liquid Chromatography (HPLC) or Hb electrophoresis.
2. On regular blood transfusion
3. Children aged between 5-14 years, indoor, outdoor and day care in SCBMCH and SVPPGIP, Cuttack.

Exclusion Criteria

1. Presence of other hemoglobinopathies such as sickle cell, HbE, HbC.
2. Presence of other chronic illness not attributed to thalassemia or its therapy.

Collection of Data

All children aged between 5-14 years diagnosed as Beta thalassemia major and on regular blood transfusion were included in the study, after obtaining consent from the parents/ guardian. Ethical clearance was taken from Institutional Ethical Committee. The data of the patient like their social and demographical details were noted along with their transfusion details, nutritional status and clinical features.

Data Analysis: All the data collected and compiled and analysed using SPSS 18.0 in the form of percentages.

RESULTS

Among the 200 patients with thalassemia studied, 67% were male with male to female ratio being 2.03. 90% of them belonged to age group 5 to 10 years, mean age being 7.9 years and 50% belonging to upper lower class. The details of social and demographic characteristics are given in table 1.

Table 1: Social and demographic characteristics of study population.

GENDER	Number of Patients (n=200)	Percentage (%)
Male	134	67
Female	66	33
AGE (YEARS)		
5-10	180	90
11-14	20	10
SOCIOECONOMIC STATUS		
UPPER MIDDLE	6	3
LOWER MIDDLE	92	46
UPPER LOWER	100	50
LOWER	2	1
MONTHLY INCOME(RS/-)		
980-2935	6	3
2936-4893	56	28
4894-7322	85	42.5
7323-9787	39	19.5
9788-19574	11	5.5
≥19575	3	1.5

On assessing the family history of these cases, 77.5% of the mothers and 69% of the fathers were found to be trait. The rest had not been tested, as shown in table 2. No parents were found to be thalassemia major. Furthermore, 21% of study population had siblings, who were noted to be diseased/ trait.

Table 3: Family history of the study group.

SIBLING HPLC* STATUS	Number Of Patients(n=200)	Percentage (%)
Not applicable (single child)	65	32.5
NOT TESTED	73	36.5
TRAIT/DISEASED	42	21
NORMAL	20	10
FATHER'S HPLC STATUS		
NOT TESTED	62	31
TRAIT	138	69
MOTHER'S HPLC STATUS		
NOT TESTED	45	22.5
TRAIT	155	77.5

It was noted that 71.5% of the study population had malnutrition, with 39% having stunting and 21% having both stunting and wasting. (Figure 1).

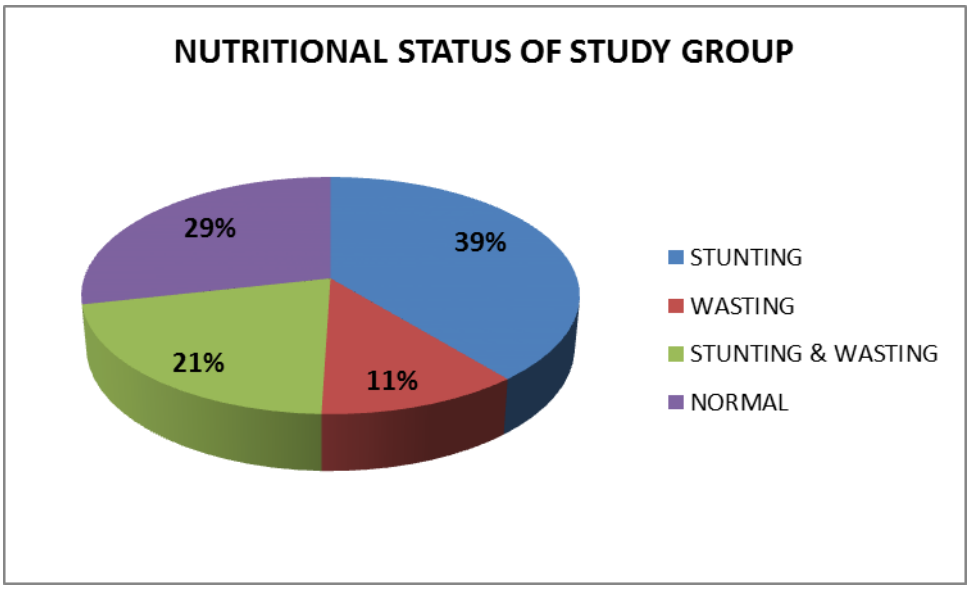

Figure 1: Nutritional status of the study group.

The average haemoglobin at admission (prior to transfusion) was 6.3g/dl, in the study population. More than half (59%) of the patients presented with haemoglobin levels between 5-7 g/dl. As seen in table 3, the age at diagnosis of almost half the children (53%) was between 6 to 9 months. Along with this, most (66%) of the cases received blood transfusion at frequency of once a month. Majority of the patients (40%) had their ferritin values greater than or equal to 2000, with average ferritin being 2096.45 ng/ml. Only 2.5% of the cases did not receive chelation therapy, others were on Deferasirox. The mean age for initiation of chelation therapy was 1.1years.

Table 3: Transfusion characteristics and age at diagnosis of the study group.

Hemoglobin At Admission (gm%)	Number Of Patients (n=200)	Percentage (%)
<5	41	20.5
5-7	118	59
7-9	41	20.5
Ferritin Level		
≤1000	41	20.5
1000-2000	79	39.5
>2000	80	40
Transfusion Frequency (Per Month)		
ONCE	132	66
TWICE	63	31.5
>TWICE	5	2.5
Age At Diagnosis (Months)		
<6	61	30.5
6-9	106	53
9-12	33	16.5

The various clinical features with which the cases were admitted is shown in figure 2. Fatigue (56%) and splenomegaly (97.5%) were the most common symptom and clinical finding observed. 3.5%(7) had complications namely HIV(2/7) and Hepatitis B(1/7), probably secondary to repeated transfusion; cardiomyopathy (2/7) and hypersplenism (2/7). There was no mortality of the cases during the course of the study.

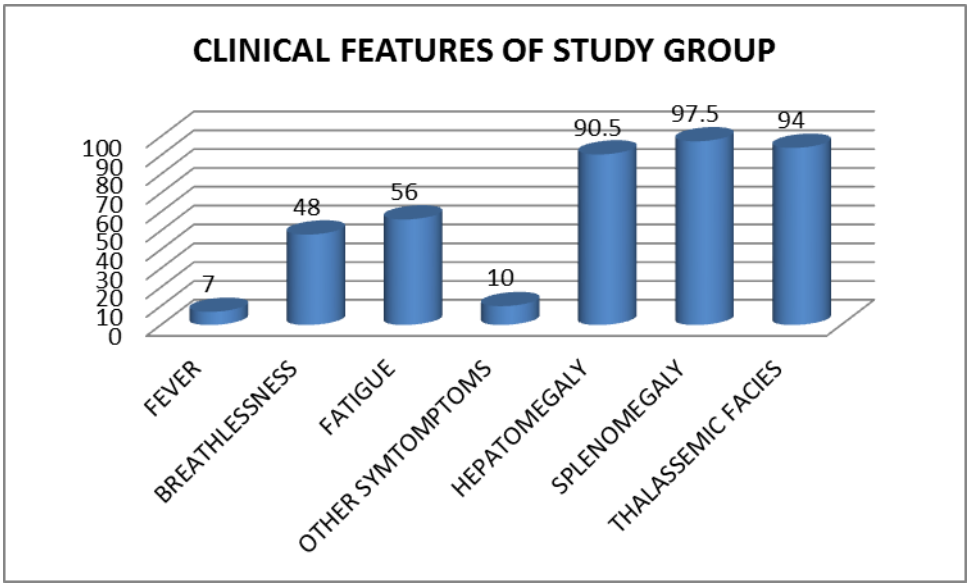

Figure 2: Clinical features of study population.

The compliance to treatment was further assessed among the parents of the cases, using combination of recall method and pill count method. Among the 200 cases, parents of 79% had good compliance to the treatment. On the other hand, parents of 63% had good knowledge about the disease, in terms of outcome and prognosis, and 37% had poor knowledge about the same.

DISCUSSION

In our study, out of 200 cases, 33% were female with male to female ratio being 2:1. Out of total 200 cases 90% were of age between 5-10 years. The present study is almost comparable to study by Boddu et al. [12] which was conducted at Southern India and has almost similar age and sex distribution among study subjects, where males comprised 64% of the population.

Among the 200 cases, 39% had stunting, 11.5% had wasting and 21% had both stunting and wasting. This was much lower than the rates in other studies where underweight comprised 23 to 45% of the population studied. Another Iranian study found as much as 65.7% to be stunted, which was also much higher than our population. The difference in the nutritional status is further affected by feeding practices, intercurrent infections and level of blood transfusions.[13,14,15]

The common symptoms observed in the study population were fatigue (56%), followed by breathlessness (48%) and fever (7%). Others such as cough, abdomen swelling, pain abdomen and vomiting constituted up to 10%.

94% of the study population had thalassemic facies, which is high and emphasises the need for optimum transfusion and routine dental care. In line with the study done in Mangalore, hepatomegaly and splenomegaly was present in 90.5% and 97.5% of the thalassemic children.[16]

The age at diagnosis of almost half the children (53%) was between 6 to 9 months, and 30.5% diagnosed before 6 months of age. This was lower than the rates seen in other parts of India, where it ranged from 46.7% to 60.7%. This probably arises from the lack of awareness that lies in our setting, as compared to other places in the country.[1,17,18]

More than half (59%) of the patients presented with haemoglobin levels between 5-7 g/dl, with the average pre-transfusion haemoglobin levels being 6.3 g/dl. This was in contrast to the study done in Mangalore, where 61.3% of the study population had their pre-transfusion haemoglobin in the range between 7-9.9 g/dl.[16]

The frequency of transfusion per month of most patients was once a month (66%) with minimal population (2.5%) requiring more than twice a month. The study done at Ahmedabad, India, the frequency of transfusion was once or more in a month among 25.6% cases which was also similar to our findings.[19] This was in accordance with guidelines where the usual frequency of one transfusion every 2–4 weeks is recommended among thalassemia cases so that hemoglobin level is maintained more than 9–10.5 g/dl.[13,20] Similar results were seen in study by Ansari et al, where [21] where most of the patients received blood transfusion once a month i.e. 67.%, An optimum blood transfusion protocol is very much a necessity for good growth and prevention of extra medullary haematopoiesis.[22] However, the ease of accessibility of the hospital or blood transfusion facility, along with the awareness of the parents greatly influences the pre-transfusion haemoglobin level and the frequency of blood transfusion per month that the child receives.

Out of total 200 cases in our study, 20.5% had ferritin level less than1000, 79(39.5%) between 1000-2000 and 40% more than 2000. In the study done by Ansari et

al,[21] the results were slightly different, with all the three groups having almost equal distribution of patients, around 33% each. On the other hand, a study done by Riaz et al in Pakistan[23] most patients, (83.5%) had ferritin above 2000 and minimal number of patients (2.5%) had less than 1000. Sachith et al[24] found that most patients (46.4%) had ferritin level between 1000 to 2000 and 22% had above 2000. The difference between the studies could be due to the lack of regular follow- up in our study, and the non-availability of laboratory testing and specialist services in the peripheries, which led to higher number of patients in our study with higher ferritin levels.

7 out of 200, i.e 3.5% patients had complications. Of these, 3 patients had positive serology- 2 HIV and 1Hepatitis B; 2 patients had cardiomyopathy and rest 2 had hypersplenism. There was no mortality among the cases studied.

Most patients in our study, 158(79%) had good compliance to the treatment and 42(21%) had poor compliance, which was similar to the studies done by Sezaneh et al.[25] Ismail et al.[26] and Kannan et al.[27] Further, of the total 200 cases, parents & attendants of 63% had good knowledge about the disease. Similar results were obtained in study done in Karachi (59%),[28] and Saudi Arabia (64%),[29] which could be due to the high prevalence of thalassemia in their population as well.

CONCLUSION

Thalassemia is a common disease in Odisha. However, there is still delay in diagnosis of this condition, and the low pre-transfusion haemoglobin and high ferritin values suggest a need to improve the quality of care that is offered to these patients, by increasing the access to specialist care and adequate education and screening services to the masses.

CONFLICT OF INTERESTS/ FUNDING: None.

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