ISSN: 2277-5536 (Print); 2277-5641 (Online)

GEOGRAPHICAL DISTRIBUTION AND PREVALENCE PERCENTAGE OF THALASSEMIA FROM SOLAPUR DISTRICT, MAHARASHTRA, INDIA

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ABSTRACT
Present study includes the geographical distribution and the prevalence of thalassemia in Solapur District, Maharashtra, India. The medical records of thalassemia patients were reviewed. Present observational survey study, one hundred twenty five clinically proved by their medical reports, cases of thalassemic children's with age 6 months to 18 Years, coming for to get blood transfusion from different parts of Solapur district. There was maximum number of 98(98.4%) cases of Thalassemia major (TM) as compared to Beta thalassemia minor (BTMi) 10(8.0%), Beta thalassemia intermedia (BTI) 16(12.8%) cases and Sickle cell thalassemia (SCT) 1(0.8%) was observed. No cases of α thalassemia were observed in our research work.

KEY WORDS: Key words: Cooley's anemia, Geographical distribution, Prevalence, Thalassemia

INTRODUCTION

The name thalassemia derived from a combination of two Greek words: *thalassa* meaning the sea (Cooley and Lec, 1925; Cooley, 1927; Bradford and Dye 1936), that is the Mediterranean and anemia ("weak blood"). Another term found in literature, although infrequently, is Cooley's anemia and it was believed to be endemic. Prof. Cooley Thomas (1925), a pediatrician in the USA who first described the clinical characteristics of this disorder in patients of Italian origin in 1925. Whipple and Bradford (1936) studied the erythroblastic anemia of Cooley and associated pigment anomalies simulating hemochromatosis. The profile of beta-thalassemia in eastern India and its prenatal diagnosis observed by Bandyopadhyay *et al.* (2004) Agarwal *et al*. (2003). Geographic and ethnic distribution of β-Thalassemia mutations in Uttar Pradesh was observed by Agarwal *et al.* (2000). Recently, in northern and western India, Nishi *et al.*. (2008) studied the frequency of β-thalassemia trait and other hemoglobinopathies. The present study includes studying the geographical distribution and prevalence percentage of thalassemic patients from Solapur District.

MATERIALS AND METHODS

Present observational survey study, one hundred twenty five (Male =73, Female =52) clinically proved by their medical reports, cases of thalassemic children's with age 6 months to 18 Years, coming for to get blood transfusion from different parts of Solapur district, Maharashtra State. The entire survey study was carried out under the observations of Medical officer from Thalassemia transfusion centre, Indian Red Cross Society, Gopabai Damani Blood Bank, Solapur Maharashtra, India from August-2008 to July 2010. The study population consisted of one hundred twenty five, cases of Thalassemia children attending for regular blood transfusions in the following blood banks and hospitals collaborating in this multicentre study were carried out, with prior written consent from the parents/ guardians.

1) Indian Red Cross Society, Gopabai Damani Blood Bank, Thalassemia Centre, Solapur.
2) Hedgewar Blood Bank, Solapur
3) M/s Indian Red Cross Society Blood Bank, Sub Branch Sou Sarjubhai Bajaj Blood Bank, Pandharpur, District-Solapur.
4) Shriman Rambhai Shah Blood Bank, Sub Branch, Indian Red Cross Society, Barshi, District- Solapur.
5) Chatrapati Shivaji Rugnalaya, Government Hospital, Solapur.

Geographical Distribution of Thalassemia

The geographical regions of Solapur District, Thalassemia analyzed (Figure -1) in the framework of this thesis:
i) Akkalkot ii) Barshi iii) Karmala iv) Madha v) Malshirus vi) Mangalveda vii) Mohol viii) North Solapur ix) Pandharpur x) South Solapur xi) Sangola xii) Solapur City
All individuals were non-related and their selection depended on their well-defined phenotypes, transfusion-dependency, and geographical origins.

Inclusion criteria:

The criteria followed for the inclusion of the patients for this study was:
1. Patient was known thalassemic.
2. Age at commencement of transfusion was more than six months

3. The interval between the transfusions was at least 3 weeks.

Equipment

Equipment facilities from the Indian Red Cross Society, Gopabai Damani Blood Bank at Solapur, Maharashtra State, India, were used in the framework of present research work. Guidelines of Shinton *et al.* (1982), used for evaluation of instruments in hematological laboratories.

RESULTS AND DISCUSSION

An observational survey study, one hundred twenty five (Male = 73, Female =52) total 125 clinically proved by their medical reports, cases of thalassemic children's with age 6 months to 18 Years, coming for to get blood transfusion in blood banks and hospitals from different parts of Solapur District, Maharashtra State (**Table 1**). It has been found that thalassemia is a blood disease and is common in both sex. Although, in this study, the thalassemia was seemed to be more common in male than female.

Geographical distribution of thalassemia in Solapur District

Taluka wise thalassemic patient's distribution and prevalence percentage at Solapur District, shown in **Table-1** and **Figure-2**. In the **Table-2** and **Figure-3.** showed the type of thalassemic patients and their prevalence percentage entering the study (n=125).

The distribution of thalassemia patients Taluka wise as follows:

Akkalkot: thalassemia major patients were five; total (4.00%)
Barshi: thalassemia major patients were five; total (6.40%)
Karmala: one BTI and TM three, total four patients (3.20%)
Madha: BTI three and TM two, total five patients (4.00%)
Malshirus: BTI one and TM three, total four (3.20%)
Mangalvedha: BTI two and TM four, Total six ((7.20%)
Mohol: BTMi two and TM four, total six (6.40%)
North Solapur: BTI one and TM two, total three (2.40%)
Pandharpur: BTI one, BTMi one and TM fifteen (12.00%)
South Solapur: BTI one, BTMi two and TM eleven, total fourteen (11.20%)
Sangola: BTMi one and TM four, Total five (4.80%)
Solapur city: SCT one, BTI one, TM 19, total forty two (35.20%).

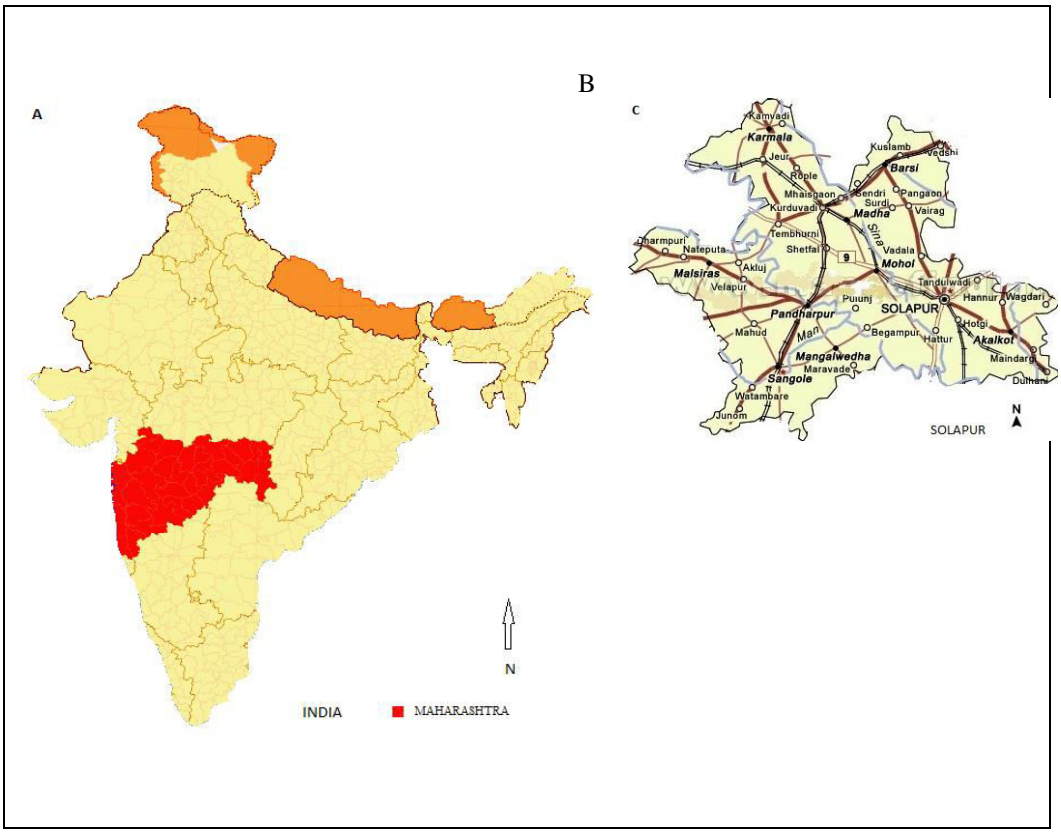

Figure- 1.. A- Map of India; Red Color indicates Maharashtra State.
B- Map of Solapur District, the geographical area of thalassemia in the framework of this research work.

Table 1. Taluka wise geographical distribution and prevalence percentage of thalassemia patients in Solapur District.

Parameter	Sex	SCT	BTI	BTMi	TM	Total Patients %
Akkalkot	M	00	00	00	03	03
	F	00	00	00	02	02
	T	00	00	00	05	05(4.00)
Barshi	M	00	00	00	03	03
	F	00	00	00	05	05
	T	00	00	00	08	08(6.40)
Karmala	M	00	01	00	01	02
	F	00	00	00	02	02
	T	00	01	00	03	04(3.20)
Madha	M	00	03	00	02	05
	F	00	00	00	00	00
	T	00	03	00	02	05(4.00)
Malshirus	M	00	01	00	03	04
	F	00	00	00	00	00
	T	00	01	00	03	04(3.20)
Mangalvedha	M	00	02	00	04	06
	F	00	00	00	03	03
	T	00	02	00	07	09(7.20)
Mohol	M	00	00	2	04	06
	F	00	00	00	02	02
	T	00	00	02	06	08(6.40)
North Solapur	M	00	01	00	01	02
	F	00	00	00	01	01
	T	00	01	00	02	03(2.40)
Pandharpur	M	00	02	01	05	08
	F	00	01	00	06	07
	T	00	03	01	11	15(12.00)
South Solapur	M	00	01	02	04	07
	F	00	00	00	07	07
	T	00	01	02	11	14(11.20)
Sangola	M	00	00	01	04	05
	F	00	00	00	01	01
	T	00	00	01	05	06(4.80)
Solapur City	M	01	01	00	19	21(28.76)
	F	00	00	00	23	23(44.23)
	T	01	01	00	42	44(35.20)

Table- 2. Showed type of thalassemic patients and their prevalence percentage entering the study (n=125)

Type of thalassemic patient	Sex	Number of patients (%)	Prevalence %
SCT	M	1	0.80
	F	0	0.00
	Total	1	0.8
BTI	M	12	9.6
	F	4	3.2
	Total	16	12.8
BTMi	M	6	4.8
	F	4	3.2
	Total	10	8.0
TM	M	54	43.2
	F	44	35.2
	Total	98	78.4
Total patients	M	73	58.4
	F	52	41.6
	Total M+F	125	100

Type of thalassemic patients in Solapur District

In our study, Sickle cell thalassemia was: male 1(1.36%), female 0(00%), Total 1(0.8%); BTI was: male 12(16.43%), female 4(7.69%), Total 16(12.8%); BTMi was: male 06(8.21%), female 4(7.69%), Total 10(8.0%); TM was: male 54(73.97%), female 44(84.61%), Total 98(78.4%); (Table- 1 and Figure- 2; 3). The results compared the frequency of β-thalassemia trait and other hemoglobinopathies in northern and western India with the reports of Nishi *et al.*., (2010). There was maximum number of 98(98.4%) cases of TM as compared to BTMi 10(8.0%), BTI 16(12.8%) cases and SCT 1(0.8%) was observed. No cases of α thalassemia were observed in our research work. Our study comprised of 73 (58.4%) males and 52(41.6%) females (Table- 2) Thus, a higher incidence of thalassemia in males was observed.

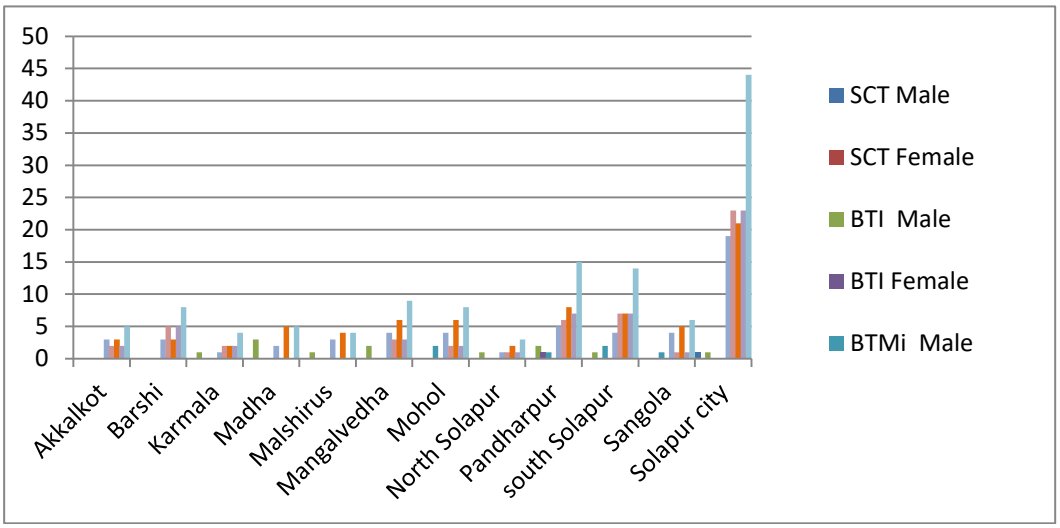

Figure-2. Showing the Taluka wise geographical distribution and prevalence percentage of the thalassemic patients in Solapur District.

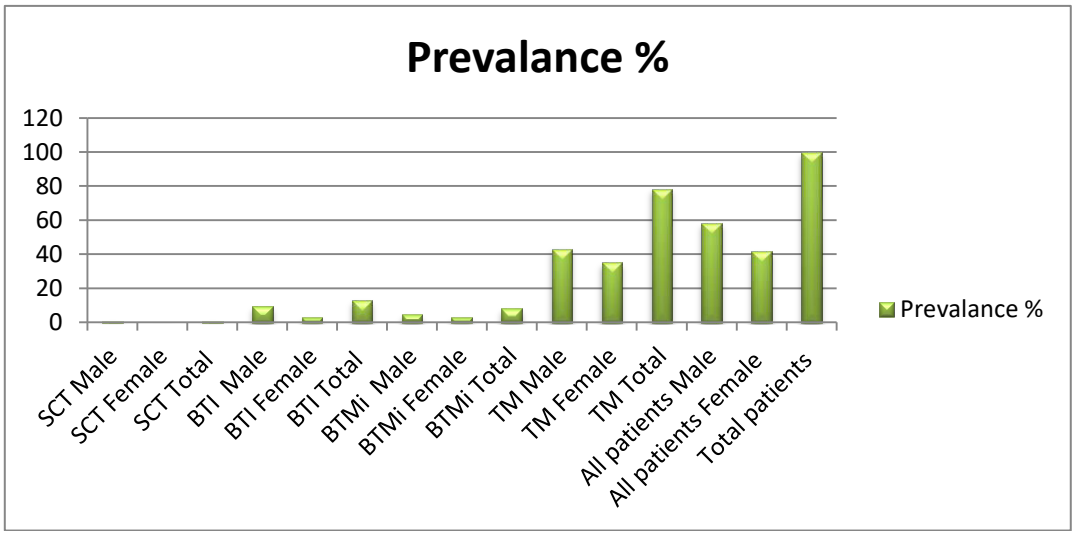

Figure -3. Showed type of thalassemic patients and their prevalence percentage entering the study (n=125)

DISCUSSION

About 10,000 children with thalassemia major are born annually in India, constituting about 10% of the total number born in the world each year (Modell and Petrou, 1983). Thus, the present study extends the observations of previous workers and provides information on the distribution of the beta thalassemia mutations among the carriers in the Gujarat state in India. The results also compared with the reports of Balgir (1995, 2005), he observed the burden of haemoglobinopathies in India; Sukumaran and Master (1973); Marwah and Lal (1994). Vaz *et al.* (2000) finds the distribution of BT mutations in the Indian population. This suggests the need to establish a program for genetic counseling and prenatal diagnosis of beta thalassemia for affected families and for initiating a control program by prospective screening of pregnant women as a multicentric study in Gujarat State. Such activities would eventually reduce the burden of this dreaded yet a common disease in the state and lead to its control. The application of the

knowledge about mutation pattern was found to be beneficial since the mutations could be screened in the order in which they are present in our population. Hence it will not only help to reduce the screening cost but also to promote early genetic counseling and prevention of an affected child.

ACKNOWLEDGEMENTS

The authors thank to Dr. P.K. Joshi, Secretary and Dr. Rajiv Pradhan, Joint Secretary for their excellent technical assistance as well as the doctors and technicians of Smt. Gopabai Damani Blood Bank (Indian Red Cross Society) Solapur for their help in blood collection during this study. The authors also thanks to the Head, Department of Zoology, Dr. Babasaheb Ambedkar Marathwada University, Aurangabad- 431001, Maharashtra, India.

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