Original Article

Growth of children with thalassemia

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Abstract:

Background: Present observational study, to surveying the growth of children with thalassemia from Solapur District, Maharashtra State, India. ***Aims***: The purpose of this article is to determine the growth of thalassemia in children by analyzing age and gender. One hundred twenty five thalassemic children's with age 6 months to 18 Years, coming for to get blood transfusion from different parts of Solapur district during June 1st , 2009 to May 1st, 2013. The questionnaires included general information, medical and dental history. ***Results***: This clinical research studied 125 patients, 73 males and 52 females. The growth of thalassemic children was observed and compared with Indian Standard Height Chart. Normal growth was: male (13.61%), female (19.23%) avarage (16.00%); growth retardation was: male (86.30%), female (80%) averages (84.00%) were observed. ***Conclusions***: Thalassemia major is a serious medical problem. Growth retardation is commonly seen in poly-transfused beta thalassemia patients.

Key words: growth; height and weight; inherited blood disorder; thalassemia

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Introduction

The name thalassemia was coined by the Nobel Prize winning pathologist George Hoyt Whipple. Whipple and Bradford[1] studied the erythroblastic anemia of Cooley and associated pigment anomalies simulating hemochromatosis. Survival of a Thalassemia major depends upon repeated lifelong blood transfusions and iron chelation. The disease can be prevented by creating awareness, genetic counseling and screening at pre-nuptial or pre-conceptual stage followed by antenatal diagnosis[2]. Without treatment, affected children have severe failure to thrive and shortened life expectancy. Treatment with a regular transfusion program, chelation therapy, bone marrow transplantation and medication aimed at reducing transfusion iron overload, allows for normal growth and development and extends life expectancy into the third to fifth decade[3].

Thalassemia is a major health problem, placing an immeasurable emotional, psychological and economic burden on millions of people around the World[4-14].

Endocrine dysfunction due to iron deposition and toxicity to the endocrine tissue is a common complication of iron overload, causing significant morbidity. Gonadal failure, sterility, and growth failure are common, as well as osteopenia and osteoporosis. Diabetes mellitus may also develop in patients with iron overload[15].

Some children's affected by thalassemia, mainly beta thalassemia major, thalassemia intermedia, beta thalassemia minor and sickle cell beta thalassemia disease live in Solapur District, Maharashtra, India. Such a large number of severely affected thalassemic patients, in need of intensive supportive therapy, medication, education, awareness and with little or no chances of being cured, represent an enormous human suffering for many families. It's economic burden is heavy on the family as well as on the nation. The present study, to find out the prevalence of thalassemic patients from Solapur District, Maharashtra State, India.

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Materials and Methods

The geographical regions of Solapur District, Thalassemia analyzed (Figure -1) in the framework research work:

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. Present observational survey study, 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 during June 1st 2009 to May 1st, 2013. 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. 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. Ethical approval was taken prior the study from Thalassemia transfusion centre, Indian Red Cross Society, Gopabai Damani Blood Bank, Solapur Maharashtra.

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.

Results and Discussion

The age range of thalassemia patients in our study was from 6 months to 18 years. Our study comprised of 73 (58.4%) males and 52(41.6%) females. Thus, a higher incidence of thalassemia in males was observed. Present study, only one SCT patient was found, total BTI patients were sixteen, BTMi were four and TM were ninety eight. Hence the prevalence percentages of TM were very high in Solapur District as compared to SCT, BTI and BTMi. The present study comprised of males and females. A higher incidence of thalassemia was observed in male than female.

The growth of thalassemic patients (Table-1 and Figure-2) was observed and compared with Indian Standard Height Chart. Normal growth was: male (13.61%), female (19.23%) avarage (16.00%); growth retardation was: male (86.30%), female

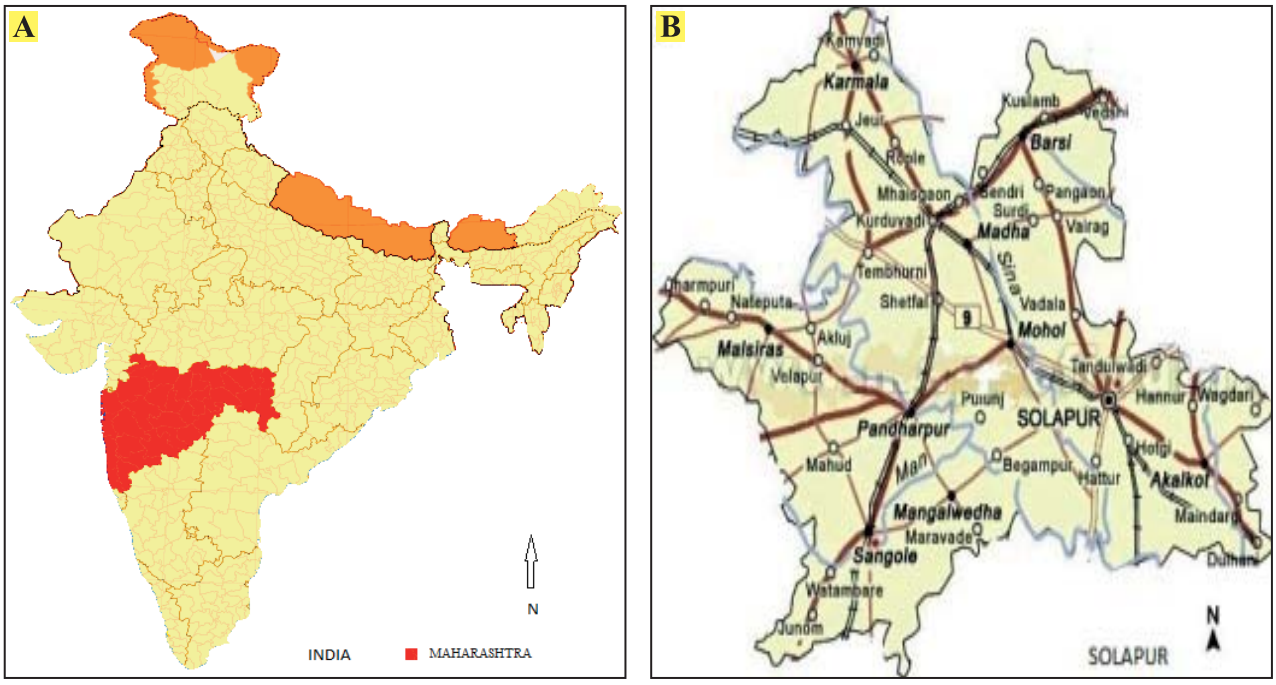

Figure- 1. Map of India; Red Color indicates Maharashtra State. B- Map of Solapur Solapur District, the geographical area of thalassemia in the framework of this research work.

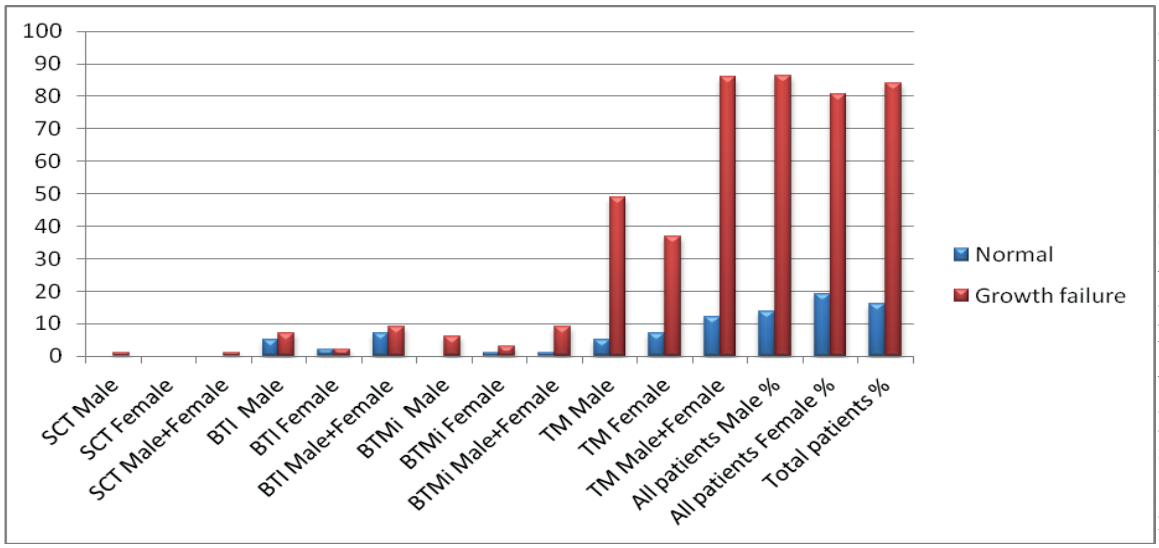

Figure- 2. Showing prevalence percentage of growth in thalassemic patients

(80%) average (84.00%) were observed. TM is a serious medical problem. Growth retardation is commonly seen in poly-transfused beta thalassemia patients. The exact mechanism of short stature in children with thalassemia major is not well understood, however, it is believed to be multi-factorial. Thus, it was observed that most of the thalassemic patients had poor build and demonstrated pallor. In all patients, It was observed that the growth retardation was early in life, in association with hypersplenism, poor musculature, and reduction of body fat, poor appetite and lethargy observed. Neeraj et. al., [11] their findings the present data comprises that the high proportion of the patients show growth retardation.

Table -1. Showing prevalence percentage of growth in thalassemic patients.

Types of Thalassemia	Sex (Total patients)	Growth	
		Normal	Growth failure
SCT	M (1)	0	1
	F (0)	0	0
	Total (1)	0	1
BTI	M (12)	5	7
	F (4)	2	2
	Total (16)	07	09
BTMi	M (6)	0	6
	F (4)	1	3
	Total (10)	01	09
TM	M (54)	5	49
	F (44)	7	37
	Total (98)	12	86
Total patients (%)	M (73)	10 (13.69)	63 (86.30)
	F (52)	10 (19.23)	42 (80.76)
	Total M+F (125)	20 (16.00)	105 (84.00%)

The present study comprised of males and females. A higher incidence of thalassemia was observed in male than female. Thalassemia was the serious medical problem. In the present research work, the findings are the failure to thrive after six months of age, stunting in height and weight. It indicates majority thalassemic patients showed poor growth in poly-transfused beta thalassemia patients. The observations showed the consanguinity rate was very high (>49%) in male and female. That indicates the need for implementing a comprehensive genetic preventive program for the eradication of thalassemia in Solapur District. Patients present with pallor, poor appetite, poor growth, lethargy and irritability was observed. Only one mentally challenged female patient was observed. As thalassemia has an impact on the different psychosocial life aspects, it is very essential to provide psychosocial support, including progress of the disease in the patients and parents for clear understanding.

Nutritional stunting as the result of reduced nutrient intake is an important cause of growth failure in young children with thalassemia and is responsive to nutritional support in thalassemic children[16]. Low[17] observed the hormone and growth abnormalities in untreated and treated beta thalassemia. Laopodis *et al.,*[18] studied the laparoscopic splenectomy in ?-thalassemia major patients. In Thailand studied by Kor-anantakul *et al.*[19]. Eshghi *et al.,*[20] finds the growth impairment in beta-thalassemia major: the role of trace element deficiency and other potential factors.

Treatment with a regular transfusion program, chelation

therapy, bone marrow transplantation and medication aimed at reducing transfusion iron overload, allows for normal growth and development and extends life expectancy into the third to fifth decade[3]. This research work is intended for a wide audience with the expectation that national health authorities, policy-makers, scholars, researchers, health workers and others committed to the advancement of public health in the Asian region.

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