

Impact of COVID-19 on children with transfusion dependant Thalassemia in a tertiary care hospital of western Maharashtra

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Abstract:

Background: The COVID-19 pandemic has affected the health care system by diversion of the healthcare resources to the COVID-19 patients. The unavailability of easy commute to the hospital, lack of public transport during lockdown added to the difficulties of the non covid patients who were on treatment requiring regular follow up. Thalassemia major is a hemoglobinopathy requiring regular blood transfusion for survival. COVID-19 restrictions have not only made it difficult for thalassemia major patients to avail health care but has also affected the availability of blood products due to a decline in blood donation. This is a single centre study at a tertiary hospital so as to study the impact of COVID -19 on the care and management of Thalassemia major children.

Materials and Methods: In this retrospective study conducted in a tertiary care centre, 75 Thalassemia major children below 12 years registered under the Thalassemia unit in western Maharashtra were included. A questionnaire was prepared and details regarding the follow up of thalassemia major children, the difficulties faced, compliance of chelation during the COVID-19 pandemic were collected telephonically. This study also compares the number of admission in the Thalassemia unit in March, April and May months of year 2020, 2021 with the admissions prior to the pandemic.

Results: Mean age of the enrolled patients was 8.3 +/-3.1 years with 39 girls and 36 boys. Out of the 75 patients enrolled only 48 patients followed up to our centre during lockdown 2020 which increased to 63 in the year 2021, accounting to 64% and 86.3% respectively. Remaining patients took transfusion at a peripheral centre and 2 patients expired due to delay in blood transfusion. The main reason for discontinuation of majority patients during lockdown was lack of transport. There was 29.2 % reduction in the number of admissions for blood transfusion in the months of March, April and May of the year 2020 when compared with the year 2019. In the year 2021 the reduction was of 27.2 %. The p value for the difference of average admission was 0.04 thus was statistically significant.

Conclusion : COVID 19 pandemic has caused a significant reduction in the follow up of Thalassemia Major children.

Key Word: Thalassemia major (TM) ; COVID -19

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I. Introduction

The World Health Organization (WHO) officially declared the SARS-CoV-2 a global pandemic on March 11, 2020. Countries were urged by WHO to adopt strict social distancing and quarantine measures to avoid virus spread and to protect public health.¹The COVID-19 pandemic has major implications for blood transfusion. There are uncertain patterns of demand, and transfusion institutions need to plan for reductions in donations and loss of crucial staff because of sickness and public health restrictions.² For a developing country like India, with fragmented blood transfusion services (especially dependent on replacement donation); it is a huge challenge. It is important to understand the nature of the emergency and its effect on transfusion services.³ Unfortunately, the COVID-19 pandemic has significantly compromised the blood supply sustenance and its utilization, with subsequent unprecedented difficulties for thalassemia-stricken children whose lives rely solely on regular blood transfusion. With nearly 200,000 affected children born every year, thalassemia remains one of the most common hemoglobinopathy worldwide.⁴ This is a single centre study at a tertiary hospital so as to study the impact of COVID -19 on the care and management of Thalassemia major children.

II. Material And Methods

It was a hospital based descriptive study conducted on 75 Thalassemia major children below 12 years registered under the Thalassemia unit of a tertiary care teaching hospital in western Maharashtra.

Study Design: Retrospective descriptive study.

Study Location: This was a tertiary care teaching hospital based study done in Department of pediatrics, Byramjee Jeejeebhoy medical college, Pune, India.

Sample size: 75 patients.

Sample size calculation: All the patients registered under Thalassemia paediatric unit of a tertiary care hospital were included .

Inclusion criteria: Registered TM children less than 12 years of age .

Exclusion criteria: Thalassemia children with COVID19 infection were excluded.

Procedure methodology :

A questionnaire was prepared and details regarding the compliance, regularity of transfusion ,blood availability ,chelation were obtained telephonically post lockdown 2020.Inclusion criteria included all the registered patients of Thalassemia major under the age of 12 years. Patients were also asked about their compliance and follow up in 2021 lockdown. Data was also obtained regarding availability of transport, socioeconomic status and employment. Details regarding the education, occupation and the income was obtained and were grouped according to modified Kuppaswamy scale 2020.We collected data regarding the number of admissions in the months of March ,April and may in 2020 and 2021 for blood transfusion from previous records and compared it with the number of admissions in March, April and May 2019 to avoid any seasonal variation.Data was entered in Microsoft excel sheet and compared as continuous variables.

Statistical analysis:

Data was analyzed using SPSS version 20 (SPSS Inc., Chicago, IL). ANOVA test was used to ascertain the significance of differences between mean values of the continuous variables. The level $P < 0.05$ was considered as the cutoff value or significance.

III. Result

This study involved 75 registered TM patients under the age of 12 years out of which there were 39 females and 36 males. The mean age group was 8.3 +/-3.1 years. 18(24%) of the patients were residing outside Pune. Out of 75 patients 12 (16%)belonged to modified Kuppaswamy class 3 and remaining 63 (84%)patients belonged to the class 4.Out of the 75 patients enrolled there were 36 males and 39 females.

Table 1:Demographics and Epidemiology

Variable	Number	Percentage
Age [mean (SD)]	8.3 (3.1) years	
Gender		
Male	36	48.0
Female	39	52.0
Residence		
Pune (Same city)	57	76.0
Outside Pune	18	24.0
Socio-economic status		
Class III	12	16.0
Class IV	63	84.0

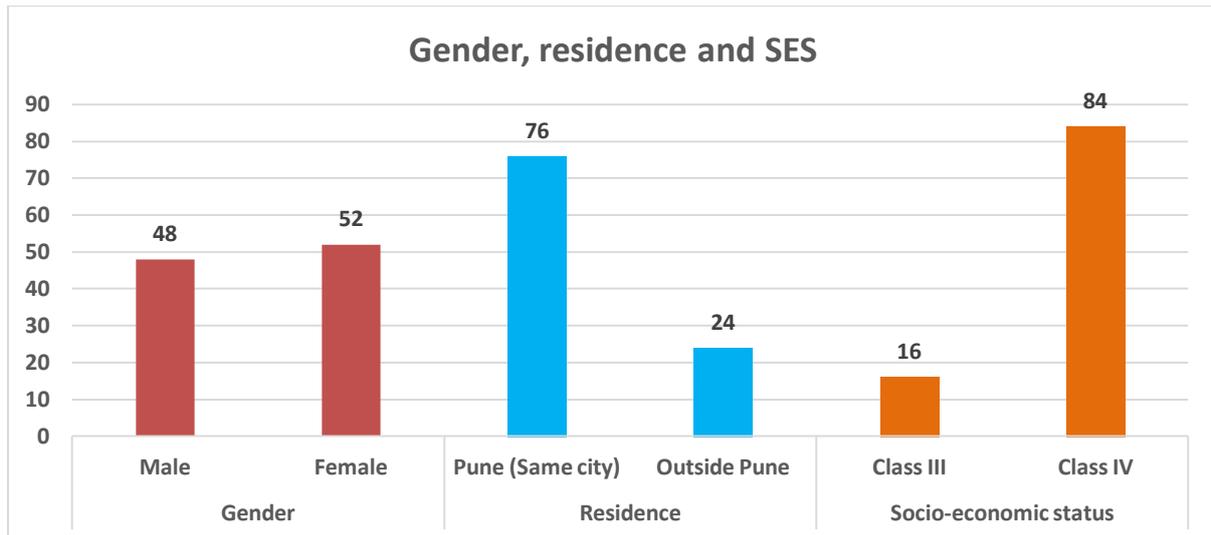


Figure-1: Demographics and epidemiology

Table 2-Blood Transfusion continued at the parent centre during lockdown

Variable	Number	Percentage
Blood transfusion during 2020 lockdown		
Yes	48	64.0
No	27	36.0
Reasons		
Lack of transport	23	75.2
Monetary	2	7.4
Patient expired	2	7.4
Blood transfusion during 2021 lockdown (n=73)		
Yes	63	86.3
No	10	13.7

Out of the 75 patients in our study 48 patients continued regular blood transfusion at parent centre whereas 27 patients did not follow up to the parent centre. 23 patients could not follow up because of lack of transport and they took blood transfusions at a nearby public or private hospital. 2 patients could not follow up due to monetary reasons. 2 patients had expired due to delay in blood transfusion. Only 64 % patients continued regular transfusion at parent centre in 2020 lockdown which improved to 86.3 percent in lockdown 2021.

Table-3 Mode of transport:

Variable	Number
Mode of transport prior to lockdown (n=75)	
Public transport	60
Private	15
Mode of transport during Covid (n=73)	
Public transport	36
Private	37
Mode of transport during lockdown (n=73)	

Public transport	4
Private	46

20 % patients used private transport prior to COVID-19 which increased to 50.7% during the COVID pandemic. 23 patients continued their blood transfusion at a nearby healthcare centre during lockdown out of which 75.2% could not reach the parent centre due to lack of transport.

Table 4:Chelation during lockdown

Variable	Number	Percentage
ICU admission (n=73)		
Yes	2	2.7
No	71	97.3
On Chelation (n=75)		
Yes	70	93.3
No	5	6.7
Was it continued during lockdown (n=70)		
Yes	63	90.0
No	7	10.0
Reasons for discontinuation (n=7)		
Monetary reasons	6	85.7
Other	1	14.3

93.3 % of all the patients enrolled in the study were on chelation out of which 90% were compliant during lockdown as well. 10 % had to discontinue taking chelating agents during lockdown mainly due to monetary reasons.

Table 5:Availability of blood during lockdown:

Availability of blood during lockdown	Number	Percentage
Available	45	88.9
Brought from nearby blood bank	5	11.1

According to our study 5 children had to bring blood from nearby blood bank during 2020 lockdown out of 50 children that followed up accounting for 11.1 percent.

Table 6 :Delay in Immunisation due to the pandemic:

Any Delay in Immunisation due to lockdown	Number	Percentage
Yes	13	17.3
No	62	82.7

Immunisation of 17.3% of the patients enrolled under this study was delayed due to the pandemic.

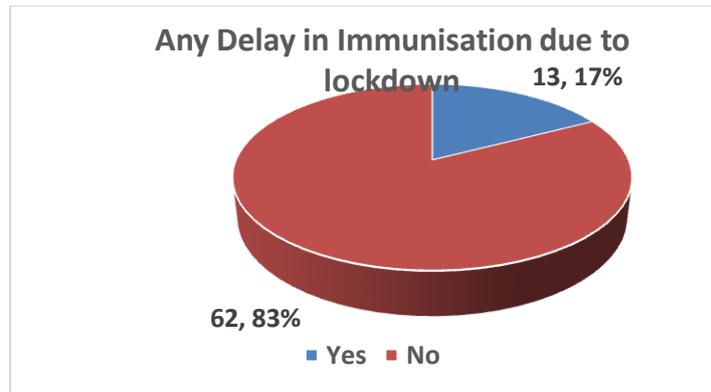


Figure 2: Delay in Immunisation due to lockdown

Table 7: Number of admissions for blood transfusion during 2019-2021.

Month/Year	2019	2020	2021
March	156	139	123
April	148	96	96
May	152	88	113
Total	456	323	332
Average admissions	152	108	111
P value for difference in average admission =0.04*			

*One-way ANOVA P value statistically significant.

There was 29.2 % reduction in the number of admissions for blood transfusion in the months of March, April and May of the year 2020 when compared with the year 2019. In the year 2021 the reduction was of 27.2 %. The p value for the difference of average admission was 0.04 thus was statistically significant.

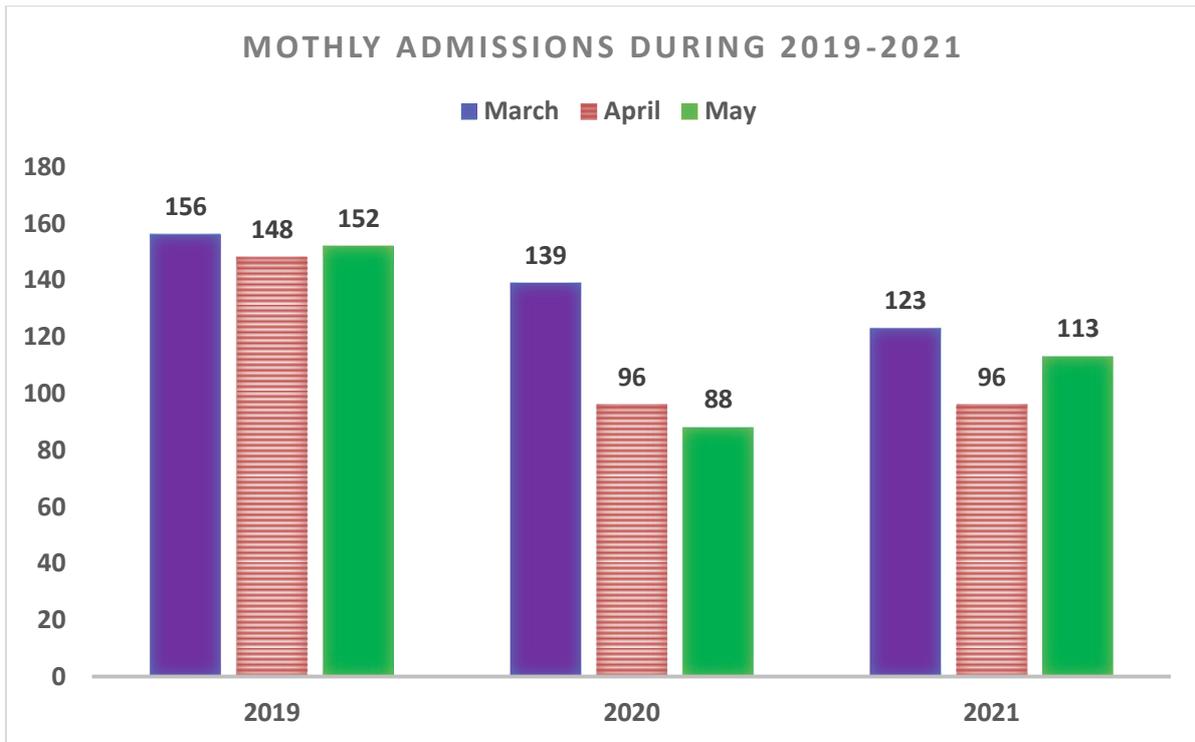


Figure 3: Monthly admissions during 2019 -2021.

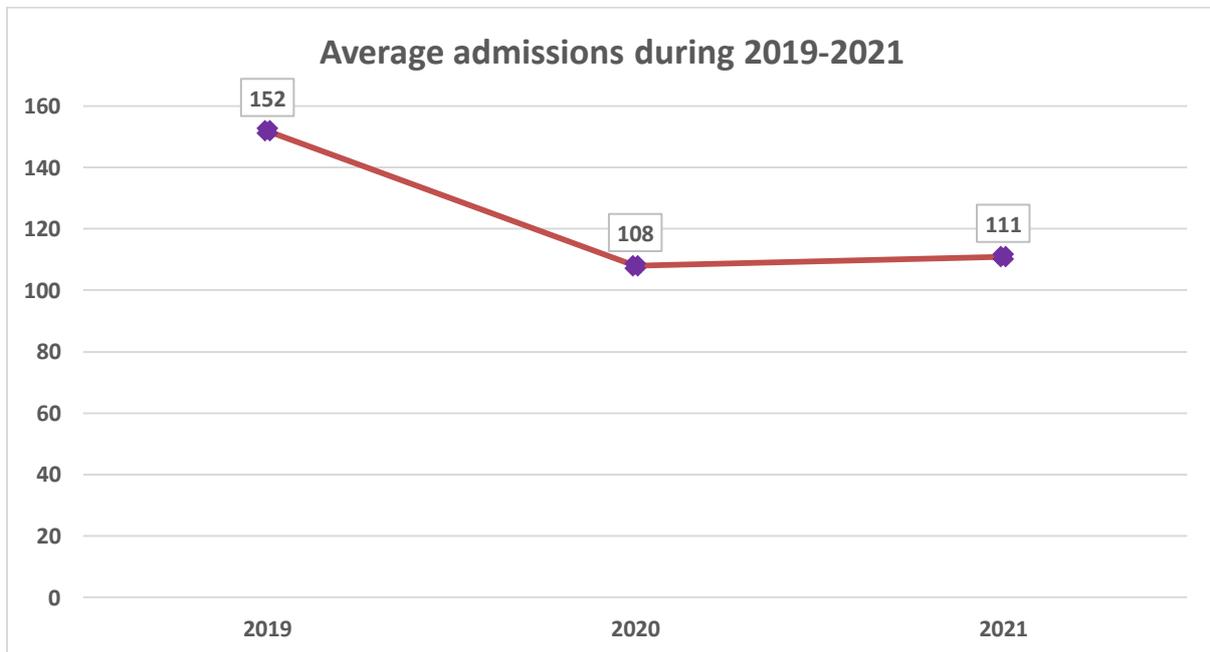


Figure4: Mean admissions in the months of March ,April and May .

IV. Discussion

In this hospital based study conducted in a tertiary care teaching hospital from March 2020 to May 2021. A total of 75 paediatric Thalassemia major children less than 12 years of age were enrolled and questioned regarding the compliance and follow up for blood transfusion during lockdown with the help of a questionnaire. Mean age of the enrolled patients was 3.1 years with 39 girls and 36 boys. Out of the 75 patients enrolled only 48 patients followed up to our centre during lockdown 2020 accounting to 64% .Remaining 27 patients took transfusion at a peripheral centre .The main reason for discontinuation of majority patients during lockdown was lack of transport according to our study.

A study done in AIIMS New Delhi reported a 56% reduction in the blood transfusions in lockdown 2020 when compared with the number of transfusions during the same period in 2019. A single centric study

conducted in Karachi, Pakistan showed a 10.56% drop in the blood transfusion in the year 2020 when compared with the year 2019⁵ In our study there was 29.2 percent reduction in admission in the months March April and May 2020 when compared with the number of admission in the same months of the year 2019.

The reduction in blood donations and hence availability of blood components has been observed throughout the world, but due to deferment of elective surgical procedures, the demand for transfusion products had also decreased^{6,7} This could also lead to overall decrease in blood components utilization across the hospital departments, as reported by 75 % respondents in a worldwide survey, though the situation may vary in centres where a significant number of hematology/oncology patients undergo treatment routinely⁸ The Indian Government has ordered prioritizing COVID-19 and emergency patients; thereby, calling off all elective transfusions. Such trends have had inevitable repercussions on patients who need regular blood transfusions therapy.³

Majority patients used public transport prior to lockdown but they had to arrange private vehicles during lockdown .24 percent of the patients in our study had to travel from outside the city for blood transfusion.75.2% of patients stated that they could not follow up during lockdown due to loss of follow up. In our study out of the 75 TM patients only 64% followed up during lockdown 2020 which improved to 86.3% in lockdown 2021.10 % of the patients under this study had to discontinue chelation due to monetary reasons.17.3% patient there was also a delay in immunization owing to the COVID -19 pandemic.

V. Conclusion

COVID 19 pandemic has caused a significant reduction in the follow up of Thalassemia Major children which has an overall impact on the healthcare.

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