Original Article

Frequency of Endocrine Complications in Thalassemia Children Admitted in A Tertiary Care Hospital

Endocrine Complications in Thalassemia Patients

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ABSTRACT

Objective: To determine the frequency of endocrine complications in thalassemic patients requiring repeated blood transfusion admitted in a tertiary care hospital.

Study Design: Cross-sectional study

Place and Duration of Study: This study was conducted at the Abbas Institute of Medical Sciences Muzaffarabad Azad Kashmir. Duration of study was from July 2021 to December 2021 for a period of six months.

Materials and Methods: Children of age 2-14 years with thalassemia major were included in this study. Venous blood sample (5 ml) was taken from the patients and sent to the institutional laboratory for specific investigations. Data was analyzed using spss-17 software.

Results: Total 180 cases were enrolled into this study including 110(61.1%) male and 70(38.8%) female cases. Mean age of the patients was 7.21 ± 3.54 years. Mean number of blood transfusions per month in this study was 3.32 ± 1.42 while 123 (68.3%) had blood transfusion more than two times per month in this study. Parental consanguinity was found in 130(72.2%) cases. Diabetes mellitus was found in 42(23.3%) and hypothyroidism was found in 28(15.5%) cases.

Conclusion: Significant frequency of endocrine complications was found in thalassemic children in our study. Endocrine complications were associated with age, number of blood transfusions per month, parental consanguinity and duration of disease.

Key Words: Thalassemia, Blood transfusion, Diabetes Mellitus, Endocrinal complications

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INTRODUCTION

According to a report of Thalassemia International Federation prevalence of Beta thalassemia is 200,000 patients all over the world.[1] Lack of proper early diagnosis, genetic counselling and screening, this problem is a big threat for future.[2] In beta thalassemia, there is reduced production of beta subunit of hemoglobin and leading to microcytic hypochromic anemia.[3] On hemoglobin analysis we see nucleated red blood cells in deranged peripheral blood smear and reduced level of hemoglobin-A. Hepato-splenomegaly and anemia are commonly found in patients with thalassemia major usually under two years of age.[4]

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MATERIALS AND METHODS

This is a cross sectional study conducted in Abbas Institute of Medical Sciences Muzaffarabad Azad Kashmir. Study was started in July 2021 and completed after six months in December 2021. Ethical consent was taken from the guardians of all patients and approval was also taken from the institutional review board. Sample size was calculated using WHO sample size formula. Consecutive sampling technique was used for sample selection. Patients with age 2-14 years, confirmed cases of thalassemia major on repeated blood transfusions (at least twice a month) of both genders were included in this study. Beta thalassemia was diagnosed on the basis of fetal hemoglobin level >50% on HB electrophoresis. All data was recorded on a predesigned performa. Venous blood sample (ml) was taken from the patients for specific investigations in the institutional laboratory. These tests were performed by a well-trained pathologist with at least five years of experience after post-graduation. Endocrinal complications were labelled if fasting blood glucose was >126 mg/dl on two different days (diabetes mellitus) and hypothyroidism when free T4 was <0.93 ng/dl. Data was analyzed using SPSS17 software. Means and standard deviation were determined for quantitative variables like age, disease duration, fasting

blood glucose level and free T4 level. Frequency and percentages were determined for qualitative variables like gender, parental consanguinity and residential area. P value < 0.05 was considered statistical significant.

RESULTS

Total 180 cases were studied including 110(61.1%) male and 70(38.8%) female cases. Mean age of the patients was 7.21 ± 3.54 years with age range of 2-14 years.

Table No.1: Characteristics of study cases (n=180)

Characteristics		Frequency (%)
Age (years)	<5	68 (37.8%)
	>5	112 (62.2%)
Gender	Male	110 (61.1%)
	Female	70 (38.8%)
Residential area	Rural	96 (53.3%)
	Urban	84 (46.6%)
Disease duration	<1 years	51 (28.3%)
	>1 years	129 (71.7%)
Number of blood transfusions	< 2 years	57 (31.7%)
	>2 years	123 (68.3%)
Parental consanguinity	Yes	130 (72.2%)
	No	50 (27.7%)
Hypothyroidism	Yes	28 (15.5%)
	No	152 (84.4%)
Diabetes mellitus	Yes	42 (23.3%)
	No	138 (76.6%)

Table No.2: Stratifications of endocrine complications with study variables

Characteristics		Endocrine complications Yes (70) No (110)		P-value
Age (years)	<5 (68)	9	59	0.014
	>5 (112)	61	51	
Gender	Male (110)	43	67	0.112
	Female (70)	27	43	
Residential area	Rural (96)	36	60	0.05
	Urban (84)	34	50	
Disease duration	<1 years (51)	25	25	<0.001
	>1 years (129)	45	84	
Number of blood transfusions per month	< 2 years (57)	14	43	0.003
	>2 years (123)	56	67	
Parental consanguinity	Yes (130)	62	68	<0.001
	No (50)	8	42	

Mean number of blood transfusions per month in this study was 3.32 ± 1.42 while 123 (68.3%) had blood transfusion more than two times per month in this study. Disease duration was <1 year in 51 (28.3%) while >1 year in 129(71.7%). Parental consanguinity was found in 130(72.2%) cases. Diabetes mellitus was found in 42(23.3%) and hypothyroidism was found in 28(15.5%) cases (Table-I).

Endocrine complications have been stratified with regard to the study variables in table-2.

DISCUSSION

Thalassemia is a heterogeneous group of inherited abnormalities of hemoglobin synthesis causing life-threatening anemia requiring repeated blood transfusions. Beta Thalassemia major is a severe form of thalassemia with short life expectancy and severe symptoms. Thalassemia is very common in Asian and Middle Eastern countries.[11] With the advancement of medical field now thalassemia patients have longer life expectancy than the past. In developing or under developed countries it is a major threat for the population and a great burden on the health system to manage these cases. With the passage of time its prevalence is decreasing due to public awareness and counselling of families regarding avoidance of cousin marriages. Its treatment require repeated blood transfusion to manage the anemia and chelation therapy for iron overload and management of endocrinal abnormalities like diabetes mellitus and hypothyroidism.[12] Bone marrow transplantation is an advanced definite treatment but very expensive and suitable for few patients only. According to a study by Hassan et al incidence of beta thalassemia major has decreased from 1:250 to 1:4000 live births.[13] According to Bordbar et al its incidence reduced from 2.3 to 0.82 cases per 1000 live births in a 10 years study duration.[14] Its incidence can be reduced using strategies like screening of population, genetic counselling and termination of affected pregnancies.[15] In our study 110(1.1%) were male and 70(38.8) were female cases. According to Casale M et al 65.7% of their thalassemic cases were male.[16] In our study mean number of blood transfusions per month in this study was 3.32 ± 1.42 while 123 (68.3%) had blood transfusion more than two times per month in this study. Disease duration was <1 year in 51 (28.3%) while >1 year in 129(71.7%). Parental consanguinity was found in 130(72.2%) cases. Diabetes mellitus was found in 42(23.3%) and hypothyroidism was found in 28(15.5%) cases. Previously a study conducted in Malaysia reported mean age of the cases in their study group as 10.8 ±3.44 years.[11] Yassin et al reported mean duration of disease 8.2 ±3.3 years in most of the cases in their study sample. This disease duration is very long as compared to our findings that may be due to increased life expectancy in their country due to advanced medical treatment as compared to our country with limited resources.[18] Previously a study conducted by Sevimli C et al reported diabetes mellitus in 43.8% and hypothyroidism 20% in their study cases.[19] These findings are comparable to our results.

CONCLUSION

In our study very high frequency of endocrine complications were found in thalassemic patients. Factors influencing frequency of endocrine

complications include age, gender, residential status, disease duration and number of blood transfusions per month. Genetic counselling, public awareness and population screening are effective strategies to reduce incidence of this disease.

Author's Contribution:

Concept & Design of Study:	Khizra Manzoor
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Data Analysis:	Noor-us-sabahat, Maryum Saleem Raja, Haseeb ul Hassan
Revisiting Critically:	Khizra Manzoor, Hamza Azhar
Final Approval of version:	Khizra Manzoor

Conflict of Interest: The study has no conflict of interest to declare by any author.

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