

IS ORAL HEALTH STATUS OF CHILDREN WITH β -THALASSEMIA WORSE THAN THAT OF THEIR NORMAL COUNTERPARTS?

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ABSTRACT

Objectives: To determine the association, if any, of patients suffering from β -Thalassemia with dental caries, gingival condition and oral health status and compare it to their normal counterparts.

Methods: A total of 90 children suffering from β -Thalassemia and 60 healthy controls (age range 6-15 years) were selected from similar socio-economic and parental education background. Oral hygiene status and gingival condition were examined using Oral Hygiene Index-Simplified and Modified Gingival Index respectively. Dental caries was recorded using DMFT/dmft Index according to the criteria described by the World Health Organization.

Results: Dental caries status in both primary and permanent dentition was found similar in both the groups of children ($p>0.5$). GI score of thalassemic children was 0.73 ± 1.08 and of the healthy subjects was 0.85 ± 0.95 ($p>0.5$), however oral health status of the two groups was found to be different ($p<0.005$) with a larger number of healthy group having "good" oral hygiene as compared to their thalassemic counterparts.

Conclusion: There was no significant difference in the dental caries status and gingival condition of children with β -Thalassemia as compared to their normal counterparts; however, oral hygiene status of the healthy children was significantly better than children suffering from β -Thalassemia.

Keywords: Oral health, β -Thalassemia, Dental caries, Gingival condition.

INTRODUCTION

Compromised oral health due to the presence of caries and periodontal disease has been documented to adversely affect the quality of life of children.¹ This

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effect is compounded in those already suffering from inherited disorders like Thalassemia.² Thalassemia is a group of inherited defects in the synthesis of alpha or beta polypeptide chains of the globin portion of the hemoglobin molecule characterized by hypochromic anemia.³ The commonest form of Thalassemia is β -Thalassemia (Thalassemia major). In Pakistan, approximately 9000 β -Thalassemia children are born every year with average life expectancy of 10 years.⁴ Children treated aggressively with frequent blood transfusions and its complications may live 20 to 30 years or longer. Medical conditions of these patients

not only affect them psychologically but also leave a devastating psycho-social effect on the family of the patient who are also financially burdened because of their child's medical conditions.⁵

Oral health of children suffering from Thalassemia major is reported to be poor by most of the researchers while some studies have denied any such association.⁵⁻⁹ The reasons for poor oral condition have been attributed to either oral structural and physiological changes that take place in Thalassemia major patients¹⁰ or to low priority given to the dental care for these children because of the parents focus on the medical procedures required to overcome life threatening problems during early childhood.¹¹ This poor oral health in turn leads to further deterioration of systemic health in these children.³

Pakistan is a developing country where approximately seventy five percent of the population lives at or below the poverty line. The prevalence of Thalassemia in the country is also high.¹² As a low priority is given to the oral health status by the masses in the country in general, this negligence might be compounded for children already suffering from a life threatening systemic disease. No studies have been done in Pakistan so far to report the oral health status of children with Thalassemia as compared to their normal counterparts. The aim of the present study, therefore, is to record the oral health condition in terms of dental caries experience, oral hygiene status and the gingival condition of thalassemic children and compare that with matched healthy control group.

MATERIALS AND METHODS

A convenient sample of 90 thalassemic children was selected from Fatmid Foundation, Lahore (Blood Bank and Hematological Services) which is a non-profit organization working for the awareness and treatment of individuals with thalassemia. The children ranged in age from 6 years to 15 years. Age-matched control group of 60 medically and physically healthy children was selected from a local summer camp with similar parental educational and socio-economic background. Ethical approval for the study was obtained from the institutional review board of Shaikh Zayed Federal Postgraduate Medical Institute, Lahore. Permission for the study was taken and prophylaxis treatments were provided to these children after the study had been performed.

Data regarding the age, gender and educational status of all the children were recorded on a proforma.

Assessment of Oral Hygiene Status

Oral condition of the children with Thalassemia was assessed while they were undergoing routine blood transfusions, under proper light. Separate sterilized dental examination instruments (dental mirror and explorer) were used for every individual. Normal children were also examined under same light while sitting in a chair.

Dental caries experience was recorded by using DMFT scores for permanent dentition and dmft scores for the primary dentition individually as "decayed", "missing" and "filled" number of teeth, using the criteria set by the World Health Organization.¹³ No radiographs were taken for caries detection.

Oral hygiene status was recorded using Oral Hygiene Index-Simplified (OHI-S) and gingival condition was assessed by using Modified Gingival Index (M-GI),¹¹ using the scores 0=good, 1=fair and 2=poor; and 0=normal, 1=mild, 2=moderate, 3=profound and 4=severe/very severe respectively.

Inter-examiner Reliability

Inter-examiner reliability was carried out amongst the three examiners for the examination of oral/dental health status. The kappa-score for this reliability was 89%.

Statistical analysis

Descriptive statistics including simple percentage frequencies along with mean and standard deviation of each clinical parameter were determined for both the groups were coded, entered and analyzed using SPSS version 13.0. Chi-square was applied for comparison between groups. For all analysis, level of significance was set at $p < 0.05$ at confidence level 95%.

RESULTS

Demographic characteristics of the two groups are presented in Table 1. The age range of the study population was between 6-15 years. The mean age of the thalassemic subjects (10.93 ± 3.18) and the healthy controls (10.21 ± 2.49) was similar. Males (65%) were more in the thalassemic group whereas gender ratio was almost same in the healthy group. There was statistical difference in the child's educational background ($p < 0.005$), as approximately 16% of children with Thalassemia had no formal education at all unlike those of their normal counterparts.

Table 1: Demographic Characteristics of the sample population

Variables controls N=150	Thalassemic subjects N=90	Healthy N=60
Age group		
6-15 years (M \pm SD)	90 (10.93 \pm 2.18)	60 (10.27 \pm 2.42)
Confidence interval	10.26-11.60	9.63-10.91
Gender		
Male	58 (64.4%)	27(45%)
Female	32 (35.6)	33(55%)
Child education*		
None	14 (15.6%)	0(0%)
< 5 grades	56 (62.2%)	40(66.7%)
> 5 grades	20 (22.2%)	20(33.3%)

* P-value=0.005

Dental caries status in both primary and permanent dentition (Table 2) was found similar in both the groups ($p>0.5$). Decayed component of the Thalassemic children was similar to that of the healthy control group but the mean filled component was observed to be zero in both the primary and permanent dentition of the Thalassemic subjects when compared to 0.16 in permanent dentition and 0.02 in primary dentition of the healthy subjects, however, this difference was not significant statistically ($p>0.05$).

Oral health status in terms of Gingival Index and Oral Hygiene Index of both the groups is shown in figures 1 and 2 respectively. Gingival health was normal amongst both the groups ($p=0.5$); GI score of the Thalassemic children was 0.73 ± 1.08 and of the healthy subjects was 0.85 ± 0.95 . However, OHI-S (Oral Health Index-Simplified) was different ($p<0.005$) with a larger number of healthy group having “good” oral hygiene.

DISCUSSION

The present study is the first attempt to systematically identify the oral health problems of the children suffering from β -Thalassemia in Pakistan. Several studies including the present investigation have observed poor dental health in children suffering from Thalassemia,⁵⁻⁹ however, the results of the present study did not observe any difference in the DMFT/dmft scores between these children and their healthy

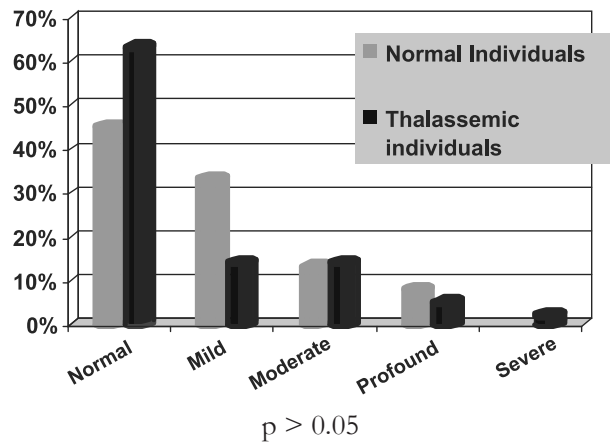


Fig.1: Comparison between Gingival conditions of Normal & Healthy subjects

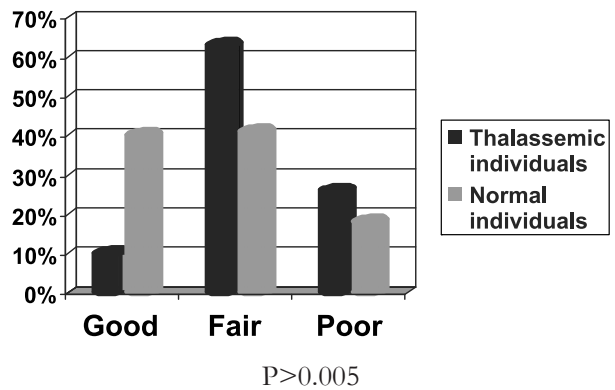


Fig. 2: Oral Health Status of Thalassemic and Normal Individuals

Table 2: Caries status in Primary and Permanent dentition of the study population

	dmft (Mean \pm SD)	Decayed (Mean)	Missing (Mean)	Filled (Mean)
Thalassemic subjects	1.50 \pm 2.48	1.37	0.12	0.00
Healthy controls	1.50 \pm 1.98	1.47	0.08	0.02
	DMFT	Decayed	Missing	Filled
Thalassemic subjects	0.76 \pm 1.26	0.76	0.00	0.00
Healthy controls	0.96 \pm 2.25	0.70	0.08	0.16

counterparts. The main difference between the two study groups was found in the filling (F) component of the DMFT, which was 0 in the thalassmic group as compared to a maximum of 4 in the healthy group of children, indicating no conservative treatment provided at all to Thalassemia subjects. However, this difference was not statistically significant ($p>0.05$). This lack of care could be attributed to neglect on the part of caregivers and also to the financial status of these families who are already burdened with other life threatening problems.²

Although, it is found in the literature that the oral mucosa of Thalassemic patients frequently displays a characteristic pale and thin appearance, the present study could not find any significant difference ($p>0.5$) in the gingival condition of the Thalassemic children with that of the non-Thalassemic group of children. However, there was a significant difference found in the oral hygiene as recorded by using OHI-S index, of the two groups ($p<0.005$) which was either "fair" or "poor" in children with Thalassemia as compared to "good" in the non-Thalassemia group. This could be an indication of either their poor dental care practices or the educational background of the children with Thalassemia. When analyzed about the educational background of the children of both the groups it was found that 15% of the diseased children regardless of their age had no formal education and those who had, could not attend more than 5 grades of formal education. On the other hand, all of the healthy children, attended school for their formal education of which 33% were in grades more than five ($p<0.005$). When compared with the levels of the education of the two groups with that of the Oral Hygiene status it was observed that with increase in the level of the education of children with Thalassemia, their oral hygiene improved, comparable to that of the normal healthy control group (data not shown). Therefore, emphasis to educate such group to keep good oral health should be considered.

In conclusion, our study did not show any relationship between Thalassemia and dental caries experience and poor gingival condition. However, special instructions in oral hygiene remain essential in Thalassemia subjects to prevent future dental disease and disease progression as these children were found to have poor oral health status. It is suggested that while these children are visiting the transfusion centers, they should be provided with special oral hygiene instructions and if possible also receive regular treatment and follow-up care including dental restoration for caries.

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