

Comparative Evaluation of Oral Health Status in Children With β -Thalassemia Major In Lattakia City - Syria

Research Article

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Abstract

Aim: Evaluating the oral health status of children with β -Thalassemia major in comparison with healthy children in Lattakia city - Syria.

Materials and Methods: A case control study, the total sample consisted of 100 children aged (6-12) years, were selected from the auditors of the Maternity and Children Hospital- Lattakia.

The study group was consisted of 50 children diagnosed with β -Thalassemia major, and regestrated in thalassemia department. The control group was consisted of 50 healthy children of the same age and gender. Anintraoral examination was conducted to asses the dental caries, gingivitis, and dental plaque levels for each child in both groups.

Results: The mean of (DMFT), modified gingival index (MGI), and plaque index (PI) were significantly higher in thalassemia group compared to the controls, and the differences were statistically significant($p<0.05$). However, there was no significant difference in the mean of (dmft) between the two groups ($p>0.05$).

Conclusions: Children with β -Thalassemia major had poor oral health compared to the healthy children, which may reflect negatively on overall healthand well-being. Therefore, it's very important to provide preventive and curative dental care to such patients.

Keywords: β -Thalassemia Major; Oral Health; Dental Caries; Gingivitis.

Introduction

Thalassemia was first described by Dr. Thomas Cooley in 1925 [1], it is defined as a heterogeneous group of inherited disorder or a diverse group of genetic blood diseases characterized by reduced or absent synthesis of one or more types of normal hemoglobin polypeptide chain, these hemolytic disorders are caused by a partial or complete deficiency of α or β -globin chain synthesis. The β - thalassemia Major (BTM) are seen mainly in South east Asia, Africa, and The countries surrounding the Mediterranean [2-4], In Syria there are more than 8000 registered BTM patients in 13 thalassemia centers in 16 provinces [5], and there is a permanent increase in the number of patients each year.

Children with BTM show symptoms during the first year of life when adult hemoglobin replaced by fetal hemoglobin, If the disease is not treated, death can occur because of severe anemia and

heart failure [6].

BTM characterized by bone marrow hyperplasia, skeletal deformities, hepatosplenomegaly [7, 8], and management depends mainly on frequent blood transfusions. Therefore, it's called Transfusion-Dependent β -Thalassemia (TDT)[9].

According to (Hamid et al 2020) BTM children are more likely to have several oral disorderslike burning sensation of oral mucosa, dry mouth, lingual varicosity, atrophic glossitis andrecurrent aphthous ulcerations [10].

BTM related with several oral manifestations like high caries experience due to poor oral hygiene, less phosphorous and IgA in saliva [11], In addition to severe gingivitis especially if splenectomy is done [12].

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Several studies in different communities investigated the association between gingival status and BTM, and reported that gingivitis was significantly higher in BTM children than healthy children [13, 14]. In addition the iron accumulation in gingival tissues was diagnosed in such patients [15]. However, some research has revealed that there is no differences between the BTM patients and their controls [16, 17].

The parents might focus on the medical aspects required to manage this disease, neglecting the oral health care in early childhood, so this poor oral health in turn leads to further deterioration of systemic health in these children [18]. In the other hand, the awareness of dentists seems important; a few dentists dare to provide dental treatment to these medically compromised individuals, most prefer to refer thalassemia major children to other specialists, and there are ones refuse to treat [19].

Materials And Methods

Sample Selection

The study group consisted of (50) BTM patients aged (6-12) years were selected from the auditors of the thalassemia Center of Maternity and Children Hospital in Lattakia city. The control group consisted of 50 healthy, unaffected children attending to the Department of Pediatric dentistry in Faculty of dentistry for routine dental check up.

Clinical Parameters

Dental caries status was assessed using DMFT/dmft index put forth by the World Health Organization (WHO 1997) [20], while the Oral hygienic conditions were recorded using the Simplified Plaque Index (PI) (Silness & Loe 1964) [21]. The periodontal parameters of the participants were evaluated using the modified gingival index (MGI) (Lobene et al. 1986) [22].

Statistical Analysis

Statistical analysis was done using Statistical Package for Social Sciences (SPSS. v.19).

U-Mann-Whitney test was used for the comparison among DMFT/dmft, PI, and MGI between the two groups. The Spearman correlation coefficient was used to investigate the relation

between gingivitis and dental plaque in each group.

The confidence interval was set to 95% and the margin of error accepted was set to 5%, and the p values less than 0.05 were considered significant.

Results

This study included 50 BTM children aged (6-12) years, and 50 healthy children, with total males (54%) and females (46%). The mean of age was (8.68) years, with a standard deviation (1.84).

Dental caries

Dental caries was observed in 94% of BTM group and 96% of controls, but the dental caries experience in permanent dentition was higher in BTM group compared to controls, the difference was statistically significant ($p < 0.05$). However, there was no significant difference in dental caries prevalence in primary dentition between both groups ($p > 0.05$). Mean DMFT was found to be 1.70 ± 1.96 among BTM children as compared to 0.94 ± 1.40 among controls while mean dmft was found to be 3.56 ± 3.170 vs 4.40 ± 2.36 respectively. Table (1) shows the DMFT/dmft values in both groups.

Dental Plaque and Gingivitis

MGI was found to be significantly higher in BTM children compared to controls (1.14 ± 0.90 vs 0.75 ± 0.72) respectively ($p < 0.05$). In addition, PI was found to be significantly higher in BTM children compared to controls (1.75 ± 0.60 vs 1.11 ± 0.69) respectively ($p < 0.05$).

All BTM children had a degree of dental plaque (100%), while there were 10% of healthy children free of dental plaque with excellent oral hygiene. Table (3) shows the dental plaque level in both groups.

18% of BTM children were free of gingivitis, and most cases were mild gingivitis in both groups (36% BTM vs 44% controls) As shown in the Table (4).

To determine the relation between gingivitis and dental plaque, Spearman's correlation coefficient showed a statistically significant relation, and this relation was found to be medium-strength,

Table 1. DMFT/ dmft values in both groups.

DMFT/ dmft	Control group	Thalassemia group	p.value
	Mean \pm SD	Mean \pm SD	
DMFT	0.94 \pm 1.406	1.70 \pm 1.961	*
DT	0.90 \pm 1.344	1.56 \pm 1.775	*
MT	0	0.08 \pm 0.566	0.317
FT	0.04 \pm 0.198	0.06 \pm 0.314	0.984
dmft	4.40 \pm 2.360	3.56 \pm 3.170	0.069
dt	3.40 \pm 1.990	2.96 \pm 2.642	0.18
mt	0.56 \pm 1.215	0.44 \pm 1.128	0.249
ft	0.44 \pm 0.929	0.16 \pm 0.548	0.06
statistically significant *			

Table 2. MGI and Pvalues in both groups.

Index	Control group	Thalassemia group	p.value
	Mean ± SD	Mean ± SD	
PI	1.11 ± 0.69	1.75 ± 0.60	0.0001*
MGI	0.75 ± 0.724	1.14 ± 0.909	0.031*
*statistically significant			

Table 3. Dental Plaque Level in Both Groups.

Dental Plaque Level	Thalassemia group	Control group
No plaque	0 (%0)	5(%10)
Light plaque	4(%8)	16(%32)
Moderate plaque	28(56%)	21(48%)
Heavy plaque	18(36%)	8(16%)

Table 4. Gingivitis level in both groups.

Gingivitis level	Thalassemia group	Control group
Normal gingiva	9(18%)	(28%)14
Mild	18(36%)	22(%44)
Moderate	13(26%)	(22%)11
Severe	10(20%)	3(6%)

Table 5. Relation between gingivitis and dental plaque.

Relation between (MGI) and (PI)	Spearman's correlation coefficient value	p value	Significance	Relation Type	Relation Strength
Control group	0.638	0.0001<0.05	statistically significant	directly proportional	Medium
Thalassemia group	0.723	0.0001<0.05	statistically significant	directly proportional	Medium

Figure 1. Distribution according to the age.

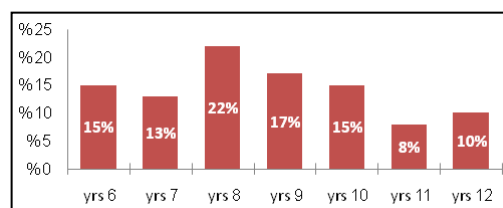
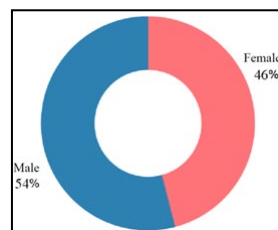


Figure 2. Distribution according to the gender.



and directly proportional in each group as shown in Table (5).

Discussion

The main purpose of this study was to determine the relationship between BTM and oral health status, To our knowledge, this study was the first attempt in Syria to investigate such problem.

The mean value of DMFT was found to be higher in BTM group (1.70 ±1.961) than controls (0.94±1.406) .This result was also documented previously by(Zeynalova 2019) in Azerbaijan[23] and (Babu 2019) in India [24], this high caries experience inBTM children might be attributed to the poor oral hygiene, poormotivation, malocclusion which was reported in BTM patients [25]. In

addition (Babu 2019) reported that salivary flow rate, buffering capacity and resting pH are lower in thalassemia children compared to the healthy children [24].

For primary teeth, the mean value of dmft was slightly higher in controls with no statistically significant difference between both groups. This result was in agreement with (Arora 2014) in India [18], and (Al-Raeesi 2018) in United Arab Emirates [26], but contradictory to the study which was done by (Anand 2019) which found a higher caries experience in primary teeth in BTM children and the difference was statistically significant ($p < 0.05$) [27].

All BTM patients in our study were receiving blood transfusion; a significant correlation was reported between transfusion and oral health status [28], this may be explained by reducing hemoglobin in BTM children requires blood transfusion which acts as a critical phase in maturation of immune mechanism, leading to many changes in the immunological profile of patients by which they suffer from several immunological disorders, making them more prone to infections like oral diseases (dental caries and gingivitis).

The oral hygiene status was found to be poor in the BTM group, mean value of the plaque index (PI) and modified gingival index (MGI) were significantly higher in the BTM group compared to the control group. These results are in agreement with the results of (Singh 2013) in India [13] and (Akcail 2015) in Turkey [14], that found a higher prevalence of gingivitis and plaque in thalassemia children compared to healthy children, with statistically significant differences.

According to (Shadlinskaya 2020) in Azerbaijan, there was no statistically significant difference in the degree of dental plaque accumulation and level of gingivitis between the two groups aged (6-12) years, the reason for this difference may be due to the variation in the used indices [29].

The results of the current study also differed with the results of (Çalışkan 2011) in Turkey, which found a decrease in the prevalence of dental plaque and gingivitis in children with thalassemia without significant differences [15]. This may be explained by the small sample size of Çalışkan study, which included (40 children), also by the difference in healthy behaviors between different societies.

The war in Syria may have been a factor behind the poor oral health of BTM children, in view of higher levels of malnutrition, stress, poor quality food and lower socioeconomic status suffered by large portions of the population.

Conclusion

The following conclusions can be drawn from this study

Syrian children with BTM aged (6-12) years in Lattakia city:

Had a higher caries rate in permanent teeth compared to healthy children; DMFT index was significantly higher in the study group. Had significantly more dental plaque and gingivitis than healthy children; dental plaque index (PI), and modified gingival index (MGI) were significantly higher in the study group.

BTM is associated with poor oral health, so efforts should be made to ensure access to preventive care.

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