



Periodontal Health Status among 6-12 years patients with Beta- thalassemia Major Syndrome in Baghdad –Iraq.

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Abstract

Thalassemia constitutes a form of anemia that has clear problems in relation to oral and dental health.

The aim of this study was to investigate the occurrence and severity of periodontal diseases among patients with β -thalassemia major (β tm) at (6-12) years of age in Baghdad city in comparison to healthy control.

Our study sample comprised 50 patients of both sexes were examined ,who were attending the thalassemia center in Al-Karama Hospital .A similar number of healthy control matching with age and gender were involved .

Plaque index of Silness &Löe (1964) and Calculus index of Ramfjord (1959) were used to assess oral cleanliness (dental plaque and dental calculus respectively).

Gingival index of Löe &Silness (1963) was used for recording gingival health condition.

Results were generally observed a poor oral hygiene .Highly significant difference in means of plaque index (1.902 ± 0.68 , 0.9384 ± 0.51) and gingival index (1.390 ± 0.94 , 0.840 ± 0.46) between β tm and control groups respectively, while not significant in mean of calculus index (0.470 ± 0.63 , 0.3362 ± 0.42) between groups.

The present study showed that most patients with β -thalassemia major were affected by gingivitis of moderate type (38%), while most of control of mild type (76%).

Keywords: β -thalassemia major syndrome, plaque index, gingival index, calculus index.

Introduction

Thalassemia is a congenital hemolytic anemia caused by partial or complete deficiency of globulin protein chain synthesis resulting in microlytic anemia of varying degrees.⁽¹⁾

β -thalassemia mutations are common in Mediterranean and Middle Eastern area with carrier rates of 10-15% and about 3% of the world's populations carry β - thalassemia genes.^(2,3)

Based on their clinical and genetic order, thalassemia is classified mainly into major (homozygous) and minor (heterozygous) type. Double heterozygous forms cause a major clinical syndrome with severe anemia and extramedullary hematopoiesis. As a result of chronic transfusion, which is necessary for those patients, excessive iron load and hemochromatosis develop, and mainly organ systems,

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espacialy cardiovascular and endocrine systems will be affected. Extramedullary hematopoiesis also results in bony deformities. In the face, enlargement of jaw and its alveolar process produce various and serious malocclusion stages such as maxillary overbite.^(4,5)

There are many risk factors that affect the prevalence and severity of periodontal disease. Oral hygiene is considered the main etiological risk factor for this disease .Systemic disease has long been considered as secondary factor in periodontal disease modulating disease initiation and progression.⁽⁶⁾

Gingival and periodontal disease disturbances associated with blood dyscrasias may be attributed to the interrelationship between the oral tissue and blood forming organs.⁽⁷⁾

There are few studies in the world concerned with periodontal condition of β -thalassemia major patients which shown that gingival tissue among those patients to be thin, pale and atrophic.^(8,9)

Other study found that most of these patients had marginal gingivitis at the level of lower anterior teeth while other had pale atrophic mucous membrane.⁽¹⁰⁾

Material and Method

The sample in this study consist of 50 patients with an age ranged 6-12 years (24 male, 26 female)attending the center of thalassemia in Al-Karama Hospital in Baghdad for their regular treatment ,blood transfusion, hemoglobin checking and assessment for the general condition and 50 (26 male,24 female)healthy children matching with age and gender.

Examinations were carried out in a suitable room under standardized condition using plane mouth mirror no.

(4) And sharp sickle-shaped explorer no. (00).

Dental plaque and calculus were recorded according to the criteria reported by Silness & L  e (1964), Ramfjord (1959) respectively. Gingival condition was assessed using gingival index by L  e & Silness (1963).

The data were analyzed using ANOVA, Student t-test in order to detect the significance between various variable.

Result

Table (1) illustrates the mean values &SD of plaque index according to age and gender in β tm and control group.

Results revealed that plaque index among β tm group (1.9020 ± 0.68) was higher than that seen in control (0.9384 ± 0.51), difference was statistically highly significant ($t=3.720$, $p<0.01$). β tm male and female had a higher plaque mean values than control and differences were found to be statistically highly significant respectively ($t=6.634$, $p<0.01$; $t=4.919$, $p<0.01$).

When differences were studied according to age groups results demonstrated that mean values were increased in β tm than in control for both ages with statistically highly significant $p<0.01$.

Gingival index (mean &SD) according to age and gender for both β tm and control group is seen in table (2). Results showed that gingival mean value among β tm group was higher than that seen in control, difference was statistically highly significant ($t=3.720$, $p<0.01$). This picture was seen in both ages with statistically not significant at age 6-8 ($t=1.292$, $p>0.05$), while highly significant at age 9-12 ($t=3.791$, $p<0.01$).

Table (3) demonstrates the distribution of the sample according to

the severity of gingival index. In β tm group the higher percentage was recorded at moderate score (38%), mild (36%), sever (16%), and lower percentage at zero score (10%), while in control group, the higher percentage was found in mild score (76%), moderate (18%), zero (6%), and zero % at sever score, with no statistical significant differences were recorded in severity of gingival index between both groups ($p>0.05$).

The total means of calculus index were found to be more or less similar ,in β tm group (0.4700 ± 0.63)and control group (0.3362 ± 0.42), this difference was found to be statistically not significant($t=1.257, p>0.05$) .No statistically significant difference were found between both groups regarding total males and total females in all ages $p>0.05$, Table(4) .

Discussion

The current investigation revealed that the mean value of plaque index is highly in β tm than in control group, this agrees with Kaplan et al.1964, Mohammed 2004, Ghasempour et al.2005^(8,11,12).

This increase in plaque index among β tm patients may be related to oral neglected condition present in the patients who placed a low priority on dental care and cleansing of their teeth because these patients are so preoccupied with their main life treating illness that they neglect basic and preventive care and may be related to psychological effect on the family of the patients.

Data of this study showed that the amount of dental calculus is fairly small in both groups with statistically not significant increase in β tm (0.470 ± 0.63) than in control (0.3362 ± 0.42).

Measurement of dental calculus is very important because the amount of

calculus directly related to the severity of periodontal diseases.

This study reveals a high prevalence with moderate score of gingivitis was found among β tm in comparison to mild score among control group.

This finding in accordance with many studies on β tm patients, Kaplan et al.1964, Siamopoulou et al.1992, Mohammed 2004, Ghasempour et al.2005^(8,11,12,13). While Al-Wahadni et al.2002⁽¹⁴⁾, reported that thalassemia is not associated with increased levels of gingivitis.

Gingivitis is plaque related disease as dental plaque was shown to be the main etiological factor for gingival inflammation ^(15,7). In the present study the mean of plaque index for β tm patients was statistically highly significant difference with control group.

The incidence of gingivitis in patients β tm which seems likely related to local factor such as poor oral hygiene , malocclusion and drying of the gingival tissue though the patients inability to close their mouth over the protruding teeth. The chronic anemia in some cases predisposed to gingival disorders, Kaplan et al., 1964 ⁽⁸⁾.Gingival inflammation was found to be higher in children with incompetent lips and mouth breather⁽¹⁶⁾; this may explain the increase severity of gingivitis among β tm examined in this study.

Previous studies showed that β tm patients might have immunological abnormalities which may lead to increase incidence of infection. Those include decreased in phagocytosis, defect in chemotactic migration of neutrophils^(17,18). This may be another relation for the increase in gingivitis among those patients.

It has been noticed that the gingival condition get worse with increasing age with statistically not significant at

age 6-8 and highly significant at age 9-12. This is in agreement with that reported by Mattia et al, 1996⁽¹⁰⁾ reported that the retention of deciduous teeth in a study concerning 6-27 years. The state of gingival condition are deteriorated with age, this is not to imply that aging cause an increase in the prevalence, extent, and severity of periodontal disease but the progression and accumulative effects of periodontal disease are more severe with ageing⁽¹⁹⁾.

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Table (1) Plaque Index (mean \pm S.D) of β -thalassemia major & control groups according to age & gender

Age	Gender		N	Mean	S.D	t-test	P-value	Sig.
6-8	male	Control	8	1.1500	0.63	2.675	0.017	S
		β tm	10	2.0100	0.71			
	Female	Control	8	0.9625	0.63	2.485	0.025	S
		β tm	9	1.6111	0.44			
	Total	Control	16	1.0563	0.62	3.652	0.001	H.S
		β tm	19	1.8211	0.61			
	male	Control	18	0.8344	0.32	6.774	0.000	H.S
		β tm	14	1.8714	0.54			
9-12	Female	Control	16	0.9375	0.56	4.295	0.000	H.S
		β tm	17	2.0176	0.85			
	Total	Control	34	0.8829	0.44	7.290	0.000	H.S
		β tm	31	1.9516	0.72			
	male	Control	26	0.9315	0.45	6.634	0.000	H.S
		β tm	24	1.9292	0.61			
All	Female	Control	24	0.9458	0.57	4.919	0.000	H.S
		β tm	26	1.8769	0.75			
	Total	Control	50	0.9384	0.51	8.056	0.000	H.S
		β tm	50	1.9020	0.68			

S: Significant at level $P < 0.05$.H.S: Highly Significant at level $P < 0.01$.Table (2) Gingival Index (mean \pm S.D) of β -thalassemia major & control groups according to age & gender

Age	Gender		N	Mean	S.D	t-test	P-value	Sig.
	male	Control	8	0.7875	0.55	1.107	0.285	N.S
		β tm	10	1.2100	0.96			
	6-8 Female	Control	8	0.8125	0.46	0.592	0.563	N.S
		β tm	9	0.9556	0.52			
	Total	Control	16	0.8000	0.49	1.292	0.205	N.S
		β tm	19	1.0895	0.77			
	male	Control	18	0.7611	0.31	3.430	0.002	H.S
		β tm	14	1.3429	0.63			
9-12	Female	Control	16	0.9688	0.57	2.411	0.022	S
		β tm	17	1.7647	1.19			
	Total	Control	34	0.8588	0.45	3.791	0.000	H.S
		β tm	31	1.5742	0.99			
	male	Control	26	0.7692	0.39	3.053	0.004	H.S
		β tm	24	1.2875	0.77			
All	Female	Control	24	0.9167	0.53	2.331	0.024	S
		β tm	26	1.4846	1.08			
	Total	Control	50	0.8400	0.46	3.720	0.000	H.S
		β tm	50	1.3900	0.94			

N.S: Non significant at level $P > 0.05$.S: Significant at level $P < 0.05$.H.S: Highly Significant at level $P < 0.01$.

Table (3) Distribution of the total sample according to the severity of Gingival Index

GI Score			N	%	Mean	S.D	t-test	P-value	Sig.
Zero	0	Control	3	6%	0.00	0.00	*	*	*
		β tm	5	10%	0.00	0.00			
Mild	0.1 - 1	Control	38	76%	0.7368	0.27	0.237	0.814	N.S
		β tm	18	36%	0.7556	0.28			
Moderate	1.1 - 2	Control	9	18%	1.5556	0.26	0.884	0.385	N.S
		β tm	19	38%	1.6789	0.38			
Severe	2.1 - 3	Control	0	0%					
		β tm	8	16%	3.000	0.00			

N.S: Non significant at level $P > 0.05$.Table (4) Calculus Index (mean \pm S.D) of β -thalassemia major & control groups according to age & gender

Age	Gender		N	Mean	S.D	t-test	P-value	Sig.
6-8	male	Control	8	0.2000	0.39	0.973	0.345	N.S
		β tm	10	0.3900	0.43			
	Female	Control	8	0.2000	0.34	0.063	0.950	N.S
		β tm	9	0.2111	0.38			
	Total	Control	16	0.2000	0.35	0.813	0.422	N.S
		β tm	19	0.3053	0.40			
	male	Control	18	0.3089	0.30	0.226	0.823	N.S
		β tm	14	0.3357	0.37			
9-12	Female	Control	16	0.5031	0.54	1.026	0.313	N.S
		β tm	17	0.7647	0.88			
	Total	Control	34	0.4003	0.43	1.172	0.246	N.S
		β tm	31	0.5710	0.72			
	male	Control	26	0.2754	0.32	0.821	0.416	N.S
		BTP	24	0.3583	0.39			
	All	Control	24	0.4021	0.49	0.916	0.364	N.S
		β tm	26	0.5731	0.78			
	Total	Control	50	0.3362	0.42	1.257	0.212	N.S
		β tm	50	0.4700	0.63			

N.S: Non significant at level $P > 0.05$.