Study of salivary IgA concentrations, salivary flow rate in patients with β –thalassemia major in Missan Governorate

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ABSTRACT

Background: Beta-thalassemia major is the most common monogenic known disorder in the Middle East, characterized by anomalies in the synthesis of the beta chains of hemoglobin resulting in variable phenotypes ranging from severe anemia to clinically asymptomatic Individuals. This study aimed to evaluate salivary flow rate and salivary IgA in β-thalassemia major patients. Since many oral and systemic conditions manifest themselves as changes in the flow and composition of saliva the dental practitioner is advised to remain up-to-date with this issue.
Materials and methods: The study samples consist of (60) subjects, patients group composed of (30) patients with β –thalassemia major, age rang (5-23) years and (30) healthy locking subject of both sexes as control group, with age range from (5-25) years.
Results: Most patients were in the first and second decade of life (90%) this indicate a reduced life expectancy in those patients, laboratory investigations for salivary IgA concentrations revealed a significant increase in means of this marker in compare with control group and this difference is statistically significant, (p= 0.05) at P value ≤ 0.05.Regarding the salivary flow rate there was a statistically significant decrease in mean of salivary flow rate in patients group as compared with control group (P= 0.013).
Conclusions: Beta-thalassemia major affects salivary flow rate and SIgA concentration.
Keywords: Thalassemia, salivary IgA, salivary flow rate. (J Bagh Coll Dentistry 2015; 27(3):55-57).

INTRODUCTION

Thalassemia is a serious inherited hematological disorders characterized by a deficient synthesis of either the α or β chains of globin in the hemoglobin molecule resulting in reduced Hb in red blood cells (RBC), its inherited as autosomal recessive gene disorder [(1)]. The homozygous type that is known as β- thalassemia major or Cooley's anemia is the most common monogenic disorder in the Mediterranean basin, the Middle East, the south pacific and Asia [(2)].

World health organization (WHO) data revealed that about 7% of the World's population is a carrier of a hemoglobin disorder and about 300,000-500,000 children are born each year with the severe homozygous states of these diseases [(3)]. The affected persons have various degrees of anemia (low red blood cell values) and enlarged liver and spleen, depending on the type of genetic defects in red blood cells' hemoglobin production [(4)].

Secretory immunoglobulin A (sIgA) is the dominant immunoglobulin in external secretions that bathe mucosal surfaces (respiratory, intestinal, and reproductive), where it acts as a key component of the immune system's "first line of defense" against microbial invasion [(5)], salivary IgA antibodies could help oral immunity by preventing microbial adherence, neutralizing enzymes, toxins and viruses; or by acting in synergy with other factors such as lysozyme and Lactoferrin [(6)].

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Salivary fluid is an exocrine secretion consisting of approximately 99% water, containing a variety of electrolytes (sodium, potassium, calcium, chloride, magnesium, bicarbonate, phosphate) and proteins, represented by enzymes, immunoglobulins and other antimicrobial factors, mucosal glycoproteins, traces of albumin and some polypeptides and oligopeptides of importance to oral health. There are also glucose and nitrogenous products, such as urea and ammonia [(7)]. Saliva represents an increasingly useful auxiliary means of diagnosis. Sialometry and sialochemistry are used to diagnose systemic illnesses, monitoring general health, and as an indicator of risk for diseases creating a close relation between oral and systemic health [(8)].

MATERIALS AND METHODS

Sixty subject were participated in this study, they were divided into two groups, patients group composed of 30 patients with major β–thalassemia on regular blood transfution, age rang (5-23), and 30 healthy looking subject of both sexes as a control group, age rang (5-25).They were in Missan thalassemia and hematological diseases center in Missan Province, one of the south Iraqi governorates, this center is the only center for management of thalassemic patients, in which approximately 300 patients were registered.

Patient with interferon Hepatitis B and C virus infections and Spleenoctomy were excluded. Data was collected using a special formula constructed by the researcher for demographic data including (age, gender, occupation, marital status and

residency), medical and surgical history, salivary flow rate and laboratory findings. Whole non-stimulated saliva was collected, measured, centrifuged, and 0.5 ml of supernatant is preserved in cryovials at -20 c° and analyzed later by enzyme linked immunosorbent assay (ELISA).

RESULTS

Most patients were in the first and second decade of life (90%), 20 (60%) were males and 10 (40%) were females with an age rage 5-23 years (Table 1).

Salivary flow rate shows a statistically significant difference in mean of salivary flow rate in patients group as compared with control group (Table 2).

Laboratory investigations for salivary concentration of SIgA revealed a significant difference in mean of this marker in beta thalassemia major patients as compared with control group (Table 3).

DISCUSSION

The present study showed that most of the patients with β- thalassemia major were in the first and second decades of life, which indicates a lack of life expectancy, this finding is consistent with a results found by many researchers, in which patients with β- thalassemia major live an average of 17 years and usually die by 30 years of age [9], in the present study; males constitute a higher percentage (twice the females) similar predominance were reported by other previous studies [10,11], this finding may be a gender bias due to cultural values in which male have greater care or males are more registered in these centers, many researchers found that, thalassemia affects men and women equally and occurs in approximately 4.4 of every 10,000 live births [12,13]. The present study demonstrated that a significant increase in salivary IgA concentration in patient group than control group this may be due to decrease salivary flow rate in patients group which in return increase SIgA concentration this in agree with Eliasson *et al.*, this study reported that the salivary secretion rate may inversely influence the IgA concentration in saliva.

Table 1: The distribution of study groups according to age and gender

Variables		Patients (N=30)	Control (N=30)	*Statistical test and P. value*
Age	Mean± SD (year)	12±5.6	11.4±4.9	t = 1.3
	Range	5 – 23	5- 25	P = 0.66 *NS**
Gender	Male no. (%)	20 (66.7)	18 (60.0)	FET=0.28
	Female no. (%)	10 (33.3)	12 (40.0)	P = 0.78 *NS**

Table 2: Comparison of Mean salivary flow rates between study groups

Salivary flow rate (ml/min)	Patient (N=30)	Controls (N=30)
Mean ± SD (ml/min)	0.30 ± 0.15	0.33 ± 0.085
Range	0.1 - 0.7	0.2 - 0.6
t- test = 0.97, degree of freedom= 58, P=0.013 *S*= significant at p≤ 0.05		

Table 3: Mean and standard deviation of SIgA in saliva with t- test in study groups.

Salivary IgA (µg / ml)	Patient (N=30)	Controls (N=30)
Mean ± SD	390.6 ±92.7	263.9 ±46.8
Range	189-534	169 – 369
t- test = 7.7, degree of freedom = 58, P=0.05 *S at p≤ 0.05		

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