

Prevalence of dental caries in thalassaemic major patients

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ABSTRACT

The aims of this study are to determine the prevalence of dental caries among thalassaemic major patients and compare the results with normal subjects.

The study sample consisted of (35) thalassaemic patients and (35) non thalassaemic controls, all aged (14-22) years.

Examination of the patient's teeth for dental caries prevalence in the two groups was performed using two methods; clinical and transillumination.

There was no statistical difference in the prevalence and severity of dental carries between thalassaemic and non-thalassaemic groups.

The results of this study indicate that the percentage of treated teeth in thalassaemic group was very low in comparison with non thalassaemic patients and this difference is statistically significant for all age groups except the last age group (20-22), where it is not significant.

Key words: Dental caries, thalassaemic major, haemolytic anaemia.

الخلاصة

الهدف من هذه الدراسة هو لمعرفة مدى انتشار مرض تسوس الأسنان بين مرضى فقر الدم البحرى الشديد ومقارنتها مع مجموعة ضابطة.

الدراسة شملت (٣٥) مريضاً مصابين بفقر الدم البحرى الشديد و (٣٥) آخرين غير مصابين بهذا المرض وأعمارهم تتراوح بين (١٤ - ٢٢) سنة.

تم الفحص لتحديد تسوس الأسنان بطريقتين وذلك بواسطة الفحص السريرى و عبر الإضاءة. تبين من هذه الدراسة بأنه لا يوجد فرق إحصائى معنوي بين مدى انتشار تسوس الأسنان بين الفئتين. لكن الفروقات كانت بنسبة الأسنان المعالجة بالحشوات كانت نسبة الأسنان المعالجة قليلة جداً عند فئة مرضى فقر الدم الشديد مقارنة مع نسبة الأسنان المعالجة لدى الأشخاص العاديين. وهذه الفروقات بين المجموعتين كانت معنوية بالنسبة للعينة ككل ، وأيضاً الفروقات معنوية بين مجاميع الفئات العمرية ، فقط الفئة العمرية الأخيرة كان الفرق غير معنوي.

INTRODUCTION

Thalassaemia is a genetically derived haemolytic anaemia, characterized by diminished synthesis of α or β globin chain of haemoglobin A and continuous production of fetal haemoglobin Hb.F^(1,2).

The deficiency of haemoglobin advocates blood transfusion which acts as a crucial stage in the maturation of the immune mechanism, and will change the immunological profile of the patients⁽³⁾.

Thalassaemia had been classified into:

1. Thalassaemia major.
2. Thalassaemia minor⁽⁴⁾.

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Clinical features and oral manifestation of patients

In case of Thalassaemia minor, the person may have no complain, only there may be chronic anaemia and patient live moderately active life⁽⁵⁾. The problem is present in case of thalassaemia major, the patient complains of progressive pallor with enlargement of the abdomen due to hepatosplenomegally, diarrhea, fever, vomiting and others. With the age, the faces get a mongoloid appearance, hyper atrophy of the upper maxilla, which lead to exposing the upper teeth. Prominence bones and depresses the bridge of the nose. Patients may be presented with mild Jaundice together with hepatosplenomegally⁽⁵⁾.

In the jaw, there is generalized rarefaction of alveolar bone, thinning of cortical bone and a chicken-wire appearance. All of the teeth erupted at normal time and both deciduous and permanent teeth had a yellowish brown colour⁽⁵⁾.

Oral soft tissue lesions associated with thalassaemic disease have been studied by only a few reports. Al-Mashadany⁽⁶⁾ had clearly showed that thalassaemic patients are more susceptible to periodontal disease than normal patients and had a significantly higher loss of attachment than normal patients. Also, significant difference of bone loss had been reported in thalassaemic patients⁽⁶⁾.

Treatment of thalassaemic major

The treatment of the patients includes blood transfusion and the complications of this treatment are iron over loading and deposition of the iron in the tissues⁽⁷⁾.

In addition, patients with chronic blood transfusion appear to be at risk of viral or bacterial infections.

Dental caries prevalence in thalassaemic patients

Dental caries is very important public health problem. The reasons for their importance lies in their high prevalence and the impact on individuals and society in term of pain, discomfort, social & functional limitations and the impacts on the quality of life⁽⁸⁾.

Thalassaemic patients have several factors, which may affect the dental caries prevalence, such as, malocclusion and drying of the gingiva through the patient's inability to close his mouth⁽⁵⁾.

In addition to diminished and highly viscous saliva in several cases due to deposition of iron in serous cells of salivary gland⁽⁷⁾.

Microradiographical study of odontological tissue of patients with thalassaemia major showed abnormal dental tissues.

Narendar *et al.*⁽⁹⁾ described dentin and bone of patients with thalassaemia major resembling those in dentinogenesis imperfecta and osteogenesis imperfecta.

For those reasons, it was decided to carry out this clinical study to evaluate the dental caries prevalence in such group of patients and compared with normal subjects.

MATERIALS AND METHODS

Thirty five patients with thalassaemic major, regularly attending the Thalassaemic Centre at Ibn-Al-Atheer Hospital were examined.

Those (35) patients are of age range (14-22) years. Olderly patients do not attend this hospital, but there is another centre for them. Younger patients under (14) years were not involved for investigation caries lesions. And only permanent teeth were used for collection of the data that is to preclude any artifact resulting from delayed tooth eruption.

Permission for patients' examination was obtained from the concerned authorities in Thalassaemic Centre at Ibn-Al-Atheer Hospital.

This thalassaemic group was compared with matched group of the same age and sex, that is the control group, these patients were attending the Conservative Department in College of Dentistry.

Oral examination was performed by the same examiner. The patients were classified into the following age groups: (14-16; n=22), (17-19, n=7) years, (20-22, years n = 6).

Two methods were used for the examination of the dental caries:

1. Visual examination using plane mouth mirrors and sharp dental probe with artificial light source.
2. Fiber optic transillumination light (FOTI).

This method as alternative for detecting of proximal caries than the bitewing radiographs.

Mitropoulos ⁽¹⁰⁾ reported that an average (73%) of the dental lesions, seen on bitewing radiographs are detected by FOTI as well.

The criteria for clinical examinations, dental caries was defined as any visible lesions or brown spot in the enamel on any tooth surface. The number of extracted and restored was also recorded.

Dental caries, both treated and non-treated, was detected by means of clinical examination and FOTI for each patient.

Statistical analysis includes:

1. The calculation of non-treated caries lesions (D) and treated caries lesion by restorations (F). Also, the percentage of (F) was calculated for each group and for all the samples.
2. Differences between thalassaemic and control groups were tested statistically to determine the significance of differences by means of Chi Square Test (χ^2).

RESULTS

The results of the study showed that the percentage of both untreated and treated caries lesions for thalassaemic and control groups was (12.54), (14.5) respectively (table 1).

Table (1): Dental caries for both thalassaemic and control groups

Group	No. of Sample	D*	F**	M***	D+F%	F%
Thalassaemic	35	117	5	7	12.54	0.51
Control	35	95	53	12	14.5	5.2

D*: Active caries lesion,

F** : Treated tooth with restoration,

M***: Missing tooth

The number of non-treated caries lesion in thalassaemic group was higher than that in control group. While, the percentage of treated caries lesion by restoration in thalassaemia was very low as compared with the control group (0.5% and 5.2%) respectively (table 1). The DMFT for thalassaemic patient (3.74), while DMFT for control group 4.71. The difference between the two groups is not significant.

From the statistical point of view, there were no significant differences in the percentage of both (D+F) between thalassaemic and control groups when χ^2 equals 1.25), while for (F) alone there is a significant difference.

Detailed findings about each subgroup for both thalassaemic and control groups are presented in table (2).

Table (2): Detailed findings for all age groups

Age Group	Thalassaemia	Control	Significance
1. (14-16) years • n = 22 • mean age • Male: female • Caries free person • Percentage of (D+F) • Percentage of (F)	14.5 12:10 1 13.19 0.49	14.7 12:10 3 11.8 4.43	* N.S. **S
2. (17-19) years • n = 7 • mean age • Male: female • Caries free person • Percentage of (D+F) • Percentage of (F)	18.0 4:3 zero 10.2 zero	18.0 4:3 zero 22.48 8.26	S S
3. (20-22) years • n = 6 • mean age • Male: female • Caries free person • Percentage of (D+F) • Percentage of (F)	21.6 4:2 1 12.8 1.23	21.0 4:3 1 13.78 4.08	N.S. N.S.

*: Non significant difference using X^2 **: Significant difference using X^2 .

For the first age group (14-16) years, the percentage for both D+F equals (13.19) and (11.8) for thalassaemic and control groups respectively. This difference is statistically not significant (N.S), while for (F), the difference between the two groups was significant (S) (table 2).

For the second age group (17-19) years, the percentage for both D+F equals (10.2) and (22.48) for thalassaemic and control groups respectively. This difference is statistically significant (S). While, (F) for thalassaemic group was zero, but in control group, it was (8.26) which is very highly significant.

For the last age group (20-22) years, there was no significant difference in the percentage of (D+F) between the two groups and the differences in (F) between them was not significant (N.S) (table 2).

Figure (1) shows that the total frequency of DMFT was very high in posterior region than in anterior region for both thalassaemic and control group.

Figure (2) shows the total frequency of DMFT among thalassaemic and control groups. The total frequency was found to be higher in mandibular than maxilla for the both tested groups.

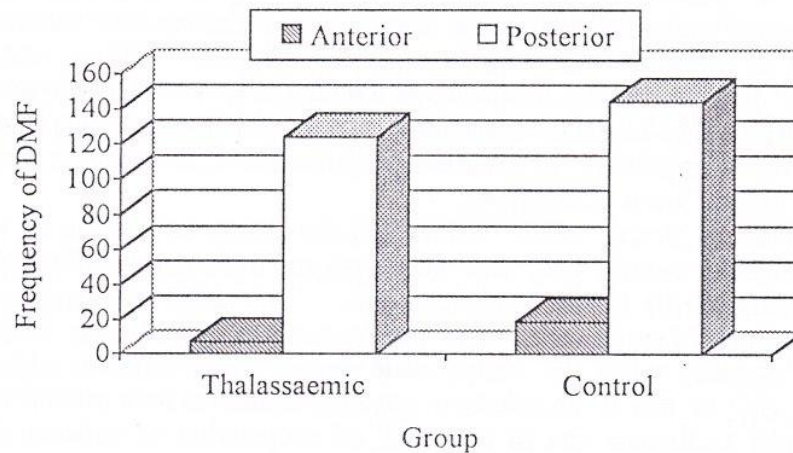


Figure (1): Frequency distribution of DMF of anterior and posterior teeth among thalassaemic and control groups

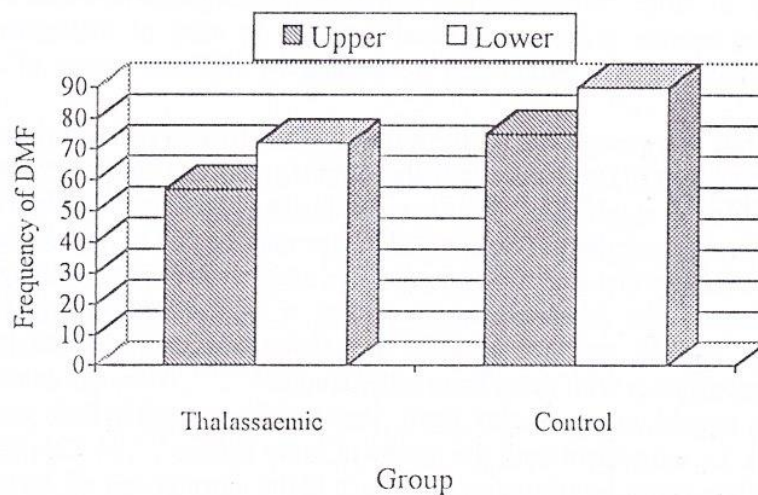


Figure (2): Frequency distribution of DMF of maxillary and mandibular teeth among thalassaemic and control groups

DISCUSSION

This study includes the examination of completely erupted permanent dentition in population (≥ 14) years old, but excluded those who are younger than (14) years old to negate the idea of any artifact resulting from mixed dentition or delayed permanent teeth eruption, thus, we are restricted by the number of samples according to conditions of patients present periodically in the hospital.

The results of this study showed that there was slightly decrease in percentage of both non-treated and treated dental caries in thalassaemic patients than in the control group, but this difference is not statistically significant. This decrease in the prevalence of dental caries in thalassaemic patients may be due to high susceptibility of this group of patients to periodontal disease. That is thalassaemic patients are more susceptible to periodontal diseases than normal subjects⁽⁶⁾. There was an inverse relationship between rapidly advancing periodontal lesions and smooth surface caries which may provide a model to obtain significant information regarding oral microbial aetiology. So susceptibility of thalassaemic patients to dental caries is like in normal patients or slightly lower in this study.

In case of treated caries' lesions (F), the difference between the two groups (thalassaemic and control one) was very large and there was significant decrease in the percentage of (F) in thalassaemic group. This difference may be due to the severity of the disease which may lead parents to ignore their children's oral condition, specially when the caries lesion present in their mouth is with little or no pain, also, due to dental awareness or negative attitude of both patients and parents toward dental treatments and in turn lack of cooperation of patients due to their illness. In addition, health status of patients that make the dental treatments of such patients to be with caution. Dental appointment for thalassaemic should be kept as short as possible to avoid tiring the patients in case of any dental treatments specially extraction or surgery should be done after blood transfusion with administration of antibiotics. The diagnosis of pain from teeth and jaw may be made more difficult because of the attacks of pain caused by marrow changes⁽¹⁾.

The results of this study showed that the decayed component (D) was higher in thalassaemic group than in control group. This is due to very small number of treated caries lesions by either extractions or restorations, although the raw data showed that most of caries lesions present in patient's mouth in case of thalassaemic group specially in the first age group can be treated by different types of restorative materials.

In the last age group (20-22), the number of the treated caries lesions increased and the differences in (F) between the thalassaemic group and control one not so large and statistically not significant. This may be due to higher age of patients that gives them the ability to seek dental treatment alone, or may be due to pain associated with advanced caries lesion that started at younger age and became worst with aging.

The data of the present study indicated a higher caries prevalence among posterior teeth than in anterior teeth in both thalassaemic and control groups. This finding is in accordance with those from other studies^(12, 13). Also, caries was found to involve more mandibular posterior teeth than maxillary teeth in both groups of this study. This is in agreement with the results of other studies^(13, 14). This difference in caries susceptibility may be related to difference in the morphology of the teeth.

So, there was a need to plan preventive and treatment programmes to these groups of patients.

Preventive method can be achieved by the use of fluoride supplements, fluoridated tooth paste and fluoride tablets or mouth rinses as well as active home care

because during patient's examination in the present study, it was found that most of the patients present with bad oral hygiene and do not use dental brush at all because of bleeding during brushing.

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