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INCIDENCE OF PERIODONTAL DISEASE IN TYPE I DIABETES MELLITUS IN RANDOM SAMPLE OF EGYPTIAN CHILDREN

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ABSTRACT

The aim of this study was to evaluate periodontal health in a group of Egyptian Children suffering from type I diabetes mellitus. Periodontal disease was clinically assessed by measurement of gingival and plaque incidence 150 children ranging age from 7 to 13 years old with type I diabetes mellitus and a control group without diabetes mellitus.

The results of this study showed that children with type I diabetes mellitus had significantly more plaque, Gingival inflammation than control group.

INTRODUCTION

The primary etiologic factor in the development of chronic gingivitis is accumulation and maturation of bacterial plaque at the gingival margin. It can progress to periodontitis with destruction of connective tissue attachment and alveolar bone leading to tooth loss. (1) Periodontal disease are considered to be one of the pathologic conditions often found in diabetics (3).

It was concluded that, in children with diabetes, periodontal disease begins around puberty and progress with age (4) i.e, the early start becomes more prominent as children become adolescents (5).

Insulin-dependent or type I diabetes mellitus; as the name indicates, results in patients who are totally dependent on exogenous insulin therapy, a situation which is associated with abnormalities in carbohydrate, lipid and protein metabolism (6). A condition which will further let those individuals more susceptible to the risks of life threatening systemic complications(7). Also the oral complications are encountered; including inflammatory periodontal diseases, xerostomia, taste impairment and caries(8).

The aim of the present study was to define the oral disease burden in young Egyptian children with insulin dependent diabetes mellitus; namely; periodontal disease.

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SUBJECTS AND METHODS

A total of 150 children of both sexes, almost equal in number (78 males and 72 females) with type I diabetes mellitus and ranged in age from 7 to 13 years old; were selected as participants in the present study. The children with insulin dependent diabetes mellitus were gathered and chosen from several places as Naser Institute, Diabetes Institute and Abo El-Reish Hospital, a control group of matched children for age, gender and also number; were invited to share this study. A written consent was obtained from all participants; as they seemed quite convinced with the study. The patients were treated only with multiple daily insulin injections; while the nondiabetic children attended the dental clinics of the previously mentioned places for routine dental checkups. Children in both groups were excluded if they were under active orthodontic therapy, had other systemic disease, or received systemic antibiotic therapy for the last 3 months.

The double blind technique was used as the study protocol for the present investigation.

The selected children were divided into 2 equal groups; where group I comprised the insulin dependent diabetic children and Group II comprised the matched nondiabetic children. All subjects of both groups were evaluated clinically by periodontal examination for all teeth using Plaque Index (11) and Gingival Index [12]; as measuring parameters; which were recorded for four sites and given a score from 0 to 3 for both indices. Probing depth and clinical attachment level (cal) were measured only for fully erupted permanent teeth; which was done with a graduated periodontal probe. For diabetic children; their medical files were reviewed for data on diabetes duration and glycated HB levels which was used as a measure of glucose control through the last three months.

The collected data of all examinees in both groups were analyzed and statistically evaluated.

RESULTS

All participants completed the present study co-operatively and without any objections or annoyance. The initial records for both insulin dependent diabetic children and nondiabetic matched control children were almost more or less similar. The statistical analysis was performed by the use of student's t-test and ANOVA; where P values lower than 0.05 were considered significant.

Oral characteristics of the study population; namely diabetes-related periodontal parameters with respect to the number of affected teeth, showed a relative difference between both groups.

The children with type I diabetes mellitus (insulin dependent); encountered a mean plaque index score of 2.40±0.29; while the matched control group (nondiabetics) revealed a plaque index score of 2.31±0.28.

The Gingival index scores showed almost parallel scores to those of plaque index scores; where they scored 2.74 ±0.51 for insulin dependent children (group I) and 2.51±0.39 for nondiabetic control group (group 11). The differences in the mean plaque and gingival indices; between both groups were statistically significant in diabetic children versus the control group (P - 0.05).

In a separate partition of (Tab.I) as for diabetic group; the diabetes related variables; namely duration and percentage blood levels of glycated HB; showed apparent and significant interrelationships with disease duration, metabolic control and the gingival inflammation (data not shown). Moreover, presence of diabetes per se; but not age or gender; is obviously interrelated with gingival inflammation too (data not presented).

TABLE (I) Comparative presentation of related variables for the insulin dependent children versus control non-diabetics.

Group	P.I. ± S.D.	G.I. ±S.D.	Duration/years + S.D.	Glycated HB in percentage + S .D.
Diabetic group (I)	2.40 + 0.29	2.74 + 0.51	4.0 ± 2.8	9.6 ±2.3
Control group (II)	2.31 ±0.28	2.51 ±0.39		
P Value	P < 0.05			

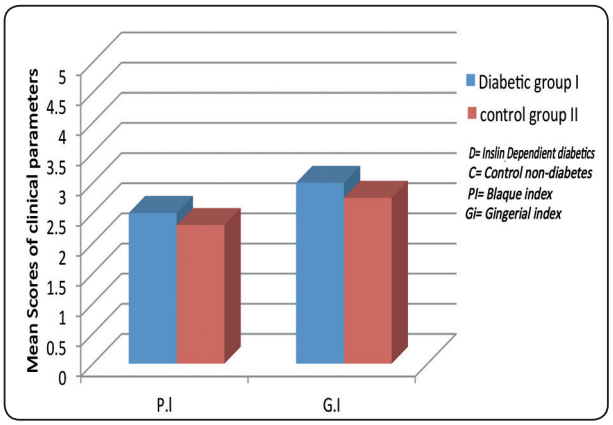

Fig. (I) Comparative illustration between study and control groups as regards to periodontal and dental Status-Total cases.

DISCUSSION

The present study showed that children with type I diabetes mellitus had apparently worse values for the majority of periodontal indices confirming that, generally, diabetes is a risk factor for gingival inflammation, periodontal disease [14-16].

The double blind technique employed in this study; rendered the obtained criteria and values within the actual records; as it became far away from any preferable tendencies evoked by the investigator. All subjects completed the investigation without complaints of the number of clinical records accomplished.

The selected group had a sufficient number of teeth in both jaws. Moreover, cases with habit neurosis, tongue thrusting, mouth breathing and mal-aligned teeth were excluded; to avoid any factor which may adversely affect the gingiva health.

The parameters used in assessment of periodontal and gingival conditions; are those commonly used in clinical trials [17]; namely the plaque index [11]; gingival index [12] systems were used. Those indices had proved to be useful means of screening the required conditions. These indices also provide the possibility of selecting specified area or teeth in the examination of a small sample. They also combine the degree of deterioration with the assumed main etiologic factor; dental biofilm. Moreover, the oral cavity is unique in that plaque- formation is a continous process, thereby providing a persistent potential for gingival inflammation

The present study illustrated that children with type I diabetes mellitus have had a variance in disease duration; a finding which is in agreement with others [18-19]; who considered duration as an independent risk factor for periodontal destruction, in children with diabetes. These findings are more or less in accordance with the results of other investigators [21]; who claimed that individuals with diabetes and poor and/or fluctuating metabolic control are at a high risk for more severe periodontal destruction. On the contrary, other investigators could not confirm this association; where they claimed that, the etiopathogenesis of both diabetes

and periodontal inflammation is complex, and identifying the mechanisms underlying this association was beyond their scope of. [18-19].

Conclusively; there is no exaggeration to mention that, the available sample of the present clinical trial is considered a more or less as a limited study, in other words, it is well documented that, accuracy of clinical trials are parallel to the size of sample. Hence, to attain a precise knowledge and comprehension of such problems; it is a must to perform a horizontal study on group population. This demand is recommended to throw the light on convinced basic data; which could be used later for accurate treatment plan programs; which are extremely needed by this sector of patients indeed. Furtherly, the generous and faithful help rendered by all member staffs and sharing individuals in and nearby this scope is quite appreciated and could not be denied.

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