PERIODONTAL HEALTH STATUS OF MALAYSIAN DIABETIC CHILDREN AND ADOLESCENT:
A Hospital Based Case-Control study in Kuala Lumpur and Kuantan

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INTRODUCTION

Diabetes mellitus (DM) is a major risk factor that predispose patients to develop a more severe and progressive form of periodontal disease (PD)[1]. Furthermore, PD has been reported the 6th complication of DM[2]. PD includes a spectrum of disorders ranging from gingivitis to periodontitis. If PD is left undetected and untreated, it can lead to early tooth loss. The interrelationships have been found to extend beyond the oral cavity; severe PD negatively affects the glycemic controls of DM patients and vice versa[2]. Therefore, assessing PD health is beneficial for oral health, and this will have effects on the glycemic control of the children and adolescent with DM. Thus, the aim of this study is to evaluate the periodontal health status of diabetic children and adolescents compared to healthy controls, in Malaysia.

METHODS

Periodontal health related parameters were clinically assessed in 32 children and adolescents (10-19 years of age) with diabetes and 32 non-diabetic control subjects. Age, gender, Body Mass Index (BMI), CDC percentiles and smoking status matching were done and purposive sampling was applied. HbA1C (%) results within 3-6 months before oral health assessment was used to define the glycemic control status of the subjects. A cross analysis and Independent sample-t test were applied to infer periodontal health status difference between cases and controls.

RESULTS

Table 1: Sociodemographic background of the subjects (n=64)

Sociodemographic variables	Cases (DM +) n(%)	Controls (non-DM) n(%)	'p' value
Gender			
• Male	17 (53.1)	16 (50)	
• Female	15 (46.9)	16 (50)	1
Age groups			
• 10-15 years	23 (71.9)	23 (71.9)	
• 16-19 years	9 (28.1)	9 (28.1)	1
Race			
• Malay	24 (75)	31 (96.9)	
• Chinese	3 (9.4)	1 (3.1)	0.35
• Indian	4 (12.5)	0	
• Others	1 (3.1)	0	
Household income (RM)			
• 1000-3000	17 (53.1)	8 (25)	0.03
• 3001-5000	8 (25)	7 (21.9)	
• 5001-10000	7 (21.9)	17 (53.1)	
Education level (mother)			
• Informal education	0	2 (6.5)	
• Below SPM	11 (34.4)	1 (3.2)	
• SPM/STPM	11 (34.4)	10 (32.3)	0.02
• Diploma	5 (15.6)	7 (22.6)	
• First degree	4 (12.5)	9 (29)	
• Higher degree	1 (3.1)	2 (6.5)	
Education level (father)			
• Informal education	0	3 (10)	
• Below SPM	8 (25.8)	0	
• SPM/STPM	14 (45.2)	7 (23.2)	0.02
• Diploma	5 (16.1)	8 (26.7)	
• First degree	4 (12.9)	10 (71.4)	
• Higher degree	0	2 (3.3)	
CDC percentiles			
• Normal (3-85)	16 (50)	23 (71.9)	
• Underweight (<3)	2 (6.2)	2 (6.2)	0.29
• Overweight (85-95)	3 (9.4)	2 (6.2)	
• Obesity (>95)	11 (34.4)	5 (15.6)	

Table 2: Diabetic related profiles of the cases (DM +)

Diabetic profiles (n=32)	n(%)
Type of DM	
• Type-1	22 (68.8)
• Type-2	10 (31.2)
DM duration diagnosed	
• Under 5 years	16 (50)
• 5-10 years	15 (46.9)
• >10 years	1 (3.1)
Family history of DM	
• Yes	24 (75)
• No	8 (25)
Mother history of gestational DM	
• Yes	4 (12.5)
• No	28 (87.5)
Medication history	
• Insulin	18 (56.2)
• Oral hypoglycemic agent (OHA)	5 (15.6)
• Insulin and/or OHA combined with antibiotics	1 (6.2)
• Insulin and/or OHA combined with other drugs	4 (12.5)
Glycemic control status (HbA1c in mmol/l)	
• Normal (<7.5)	5 (15.6)
• High (7.5-9.5)	5 (15.6)
• Uncontrolled	22 (68.8)
*MeanSD)=9.16(2.1)	
DM complications	
• No	22 (68.8)
• Yes (Metabolic syndromes)	10 (31.3)
Family smoking history	
• Father	10 (31.2)
• Mother	1 (3.1)
• Siblings	2 (6.2)
• No immediate family	19 (59.4)

Table 3: Oral health assessment between cases (DM +) and controls (non-DM)

	Cases n=32 n(%)	Controls n=32 n(%)	'p' value
Intraoral findings			
• Normal limits	5 (15.6)	11 (34.4)	
• Gingival swelling	5 (15.6)	10 (31.2)	
• Mobile/drifted teeth	1 (3.1)	0	0.01
• Caries	0	2 (6.2)	
• Crowding teeth	4 (12.5)	4 (12.5)	
• Halitosis	0	1 (3.1)	
• Gingival inflammation	12 (37.5)	2 (8.2)	
• Calculus	5 (15.6)	2 (6.2)	
• others	0	2 (6.2)	
Gingival index (categorised score)			
• Healthy	0	2 (6.2)	
• Mild inflammation (0.1-1.1)	20 (62.5)	18 (56.2)	0.54
• Moderate inflammation (1.1-2)	12 (37.5)	11 (34.4)	
• Severe inflammation (2.1-3)	0	1 (3.1)	
Peridontal diagnosis			
• Healthy	1 (3.1)	3 (75)	
• Mild gingivitis	19 (59.4)	17 (53.1)	0.62
• Moderate gingivitis	10 (31.2)	12 (37.5)	
• Mild Chronic periodontitis	1 (3.1)	0	
• Severe Chronic Periodontitis	1 (3.1)	0	

Table 4: Periodontal health assessment between cases (DM +) and controls (non-DM)

	Cases Mean(SE) (95% CI)	Controls Mean(SE) (95% CI)	'p' value
Gingival index (GI)	0.9 (0.08) (0.73,1.07)	0.8 (0.11) (0.57,1.02)	0.11
Modified Turesky-Quigley Hein plaque index (TQHI)	1.81 (0.12) (1.55,2.06)	1.94 (0.13) (1.68,2.19)	0.70
Probing pocket depth (PPD) – *one of the hallmarks of Periodontitis*	1.81 (0.13) (1.55,2.08) Min=1.07, Max=4.63	1.65 (0.06) (1.53,1.76) Min=1.20, Max=2.24	0.01
Bleeding on probing percentages (BOP%)	24 (3.8) (16.28,31.7)	21 (3.9) (12.53,28.56)	0.99

DISCUSSION AND CONCLUSION

• DM children and adolescent had significantly higher gingival inflammation, calculus and PPD compare to control subjects. Moreover, one of DM subject has been identified to suffer from severe chronic periodontitis. However, no association founds between glycemic control status with all periodontal health parameters assessed. The current findings may be influenced by cofounding factors such as; insulin treatment, types of DM, DM duration, oral hygiene practice, dietary habits, study sample size and sampling method. Further study should be conducted with controlling of these factors to obtain more valid results.

• In consideration of this early findings, periodontal screening & prevention/treatment programs should be considered as part of standard care for DM children & adolescent.

Figure-1: An intraoral photos of a case (from DM+ group). The 18 years old, female, diagnosed with Type I DM for 7 years, suffering with Severe Chronic Periodontitis.

REFERENCE

1. Lalla E, Cheng B et al. Periodontal changes in children and adolescent with diabetes : a case control study. Diabetes Care 2006;29:295-299

2. Stewart et al. The effect of periodontal treatment on glycemic control in patients with Type -2 diabetes mellitus. Journal of clinical periodontology 2001;28:306-310

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