ISSN: 0975-833X

Available online at http://www.journalcra.com

International Journal of Current Research
Vol. 9, Issue, 05, pp.51348-51350, May, 2017

INTERNATIONAL JOURNAL OF CURRENT RESEARCH

RESEARCH ARTICLE

EFFECT OF OBESITY ON THE PERIODONTAL STATUS OF URBAN SCHOOL CHILDREN AMONG SOUTH INDIAN POPULATION

***,[1]Tamizh Paavai. Tha and [2]Dr. Asha Ramesh**

[1]Bachelor of Dental Surgery, Saveetha Dental College and Hospitals, Chennai, Tamil Nadu
[2]Senior Lecturer, Department of Periodontics, Saveetha Dental College and Hospitals, Chennai, Tamil Nadu

ARTICLE INFO

Article History:
Received 11th February, 2017
Received in revised form
07th March, 2017
Accepted 15th April, 2017
Published online 31st May, 2017

Key words:

Obesity, Periodontal, Childhood, Urban, Children.

ABSTRACT

Obesity and periodontal disease are multifactorial and develop from an interaction between chronic conditions originating in early life. various epidemiological studies state that obesity is a proven risk factor for adult periodontitis. So the need of the hour is to investigate this relationship in school going children where there is a death in evidence.

Citation: Tamizh Paavai. Tha and Dr. Asha Ramesh, 2017. "Effect of obesity on the periodontal status of urban school children among south Indian population", *International Journal of Current Research*, 9, (05), 51348-51350.

INTRODUCTION

Childhood obesity is described as a serious pandemic affecting the current generation due to its vast distribution and dire consequences (Sheiham and Watt, 2000; Larson and Story, 2007). The oral health and periodontal status of a person was also considered as a significant issue that influenced the proper growth and development of children during the historic era (Kwan and Petersen, 2003; Ayhan *et al*., 1996). The World Heath Organization emphasizes on a comprehensive approach to detect, evaluate and treat general and oral health as they share similar risk factors. This approach towards health is observed to be more cost effective, efficient and sustainable (Petersen, 2003). Various studies assessed the association between obesity and periodontal status among the adults and middle-aged individuals (Al-Zahrani *et al*., 2003). The suggested mechanism to explain the relationship between obesity and periodontal disease is that the liposaccharides of gram-negative periodontal bacteria trigger the secretion of inflammatory cytokines by the adipose tissue leading to hepatic dyslipidemia and reduced insulin sensitivity. This reaction is seen to be aggravated in individuals with higher adipose tissue that results aggravation of inflammatory diseases such as periodontitis (Pischon *et al*., 2007). Other studies also suggested that obesity could be a risky behavior for periodontal disease but not a risk factor (Genco *et al*., 2005; Hujoel, 2009). However research to assess the relationship between obesity and periodontal disease among children has been scarce unlike the relationship between obesity and dental caries has been established (Visha and Deepa Gurunathan, 2016). This paper aims at assessing the interrelation between obesity and school going children among the south Indian population

Corresponding author: **Tamizh Paavai. Tha,**
Bachelor of Dental Surgery, Saveetha Dental College and Hospitals, Chennai, Tamil Nadu

MATERIALS AND METHODS

The study population for this study comprises of school children aged between 6 years to 17 years of age. The total sample size of this study was 774 which comprises of 382 girls and 391 boys belonged to three different public and private schools in Chennai. The BMI was calculated by measuring the height and weight were to the nearest cm and 0.1 kg respectively. The obtained values were entered into the CDC child-teen BMI calculator, which was age-specific, and height and weight specific calculator (Centre For Disease Control and Prevention). The percentile obtained were classified as underweight (UW), normal (N) and overweight OW) if the percentile obtained were ≤5, ≤85 and >85 respectively. Waist circumference was measured at the narrowest part of the trunk directly on the skin. For individuals with no visible waist circumference, this measure was made at the midpoint between the iliac crest and last rib. The values entered into the WHO standardized chart to obtain percentile which was used to categorize according to the chart given by Kuriyan *et al*.

(2011). The Community Periodontal Index (CPI) was the parameter used to assess the periodontal heath of the subjects. The teeth were examined with a mouth mirror and a William's Probe. The dentition was divided into six sextants and the highest score of the child was considered the score of the individual. At least six points in each tooth were examined namely mesiobuccal, distobuccal, midbuccal, distooral, midoral and mesiooral. The data was entered according to the scale as follows:0, healthy; 1. Bleeding on gentle probing; 2,calculus; 3, shallow pocket of 4 or 5mm and 4,pockets of 6mm or more (Ekuni *et al*., 2008).

Statistical analysis

All data were analyzed using SPSS (Version 11.5, SPSS Inc., Illinois, USA). Descriptive statistics included mean and standard deviation while the categorical data included the frequency. Statistical differences between groups were evaluated using One way –ANOVA along with Post Hoc tests (Hochberg) for multiple comparisons among groups. For all analysis, the P-value of ≤0.05 was considered statistically significant.

RESULTS

The data obtained from the examination of 774 children was used to categorize the boys and girls into 3 sections namely health, underweight and overweight respectively. (Fig.1)

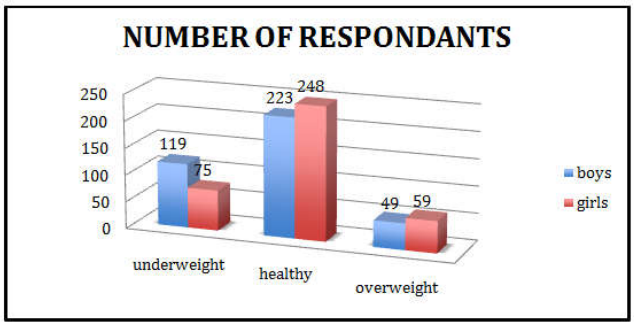

Figure 1. Descriptive Statistics

When the CPI scores were compared between the girls and boys (Table1), among three different groups based on their BMI by using One Way ANOVA and there was statistical

Table 1. One Way- ANOVA between the groups among girls and boys

BOYS				
	HEALTHY (224)	UNDER WEIGHT (118)	OVER WEIGHT (49)	SIG
CPI-TN	0.40±0.74	0.57±0.89	0.69±1.05	0.039
TOTAL	0.49±0.84			

GIRLS				
	HEALTHY (248)	UNDER WEIGHT (75)	OVER WEIGHT (59)	SIG
CPI-TN	0.37±0.65	0.37±0.65	1.02±1.26	0.000
TOTAL	0.47±0.82			

Table 2. Multiple comparisons between the groups among the boys

	BMI STATUS	BMI STATUS	SIGNIFICANCE
CPI-TN	HEALTHY	UNDER WEIGHT	0.220
		OVER WEIGHT	0.076
	UNDER WEIGHT	HEALTHY	0.220
		OVER WEIGHT	0.752
	OVER WEIGHT	HEALTHY	0.076
		UNDER WEIGHT	0.752

Table 3. Multiple comparisons between the groups among the girls

	BMI STATUS	BMI STATUS	SIGNIFICANCE
CPI-TN	HEALTHY	UNDER WEIGHT	1.000
		OVER WEIGHT	0.000
	UNDER WEIGHT	HEALTHY	1.000
		OVER WEIGHT	0.000
	OVER WEIGHT	HEALTHY	0.000
		UNDER WEIGHT	0.000

significance observed (p of ≤0.05). There was high significant difference seen in the girls (p=0.000) than that observed in the boys (p=0.039). When the 3 categories were compared within the sexes, the results obtained are tabulated in Tables 2 and 3 for boys and girls respectively. The comparisons delivered data that states that the BMI and waist circumference did not significantly influence the CPI scores in boys but they did influence the scores in girls.

DISCUSSION

This study took into account various parameters such as BMI, waist circumference and CPI scores. The huge sample size and the standardized parameters taken into account in this study differentiate it from other studies conducted in this population. The model proposed by Genco *et al*., linking, obesity and periodontal health states that the obese subjects have increased plasma levels of pro-inflammatory cytokines and its soluble receptors that may lead to a hyper-inflammatory state thus increasing the risk of periodontal disease (Genco *et al*., 2005). The Community Periodontal Index is a widely used parameter to assess the periodontal status and is attributed for its simplicity and repeatability. Many studies have been conducted in different populations to assess the relation between BMI and/or waist circumference to periodontal health of children and adolescents (Scorzetti *et al*., 2013; Irigoyen-Camacho *et al*., 2014). This is the first study to assess this relationship in the South Indian population. In this study when the BMI and waist circumference of boys and girls were compared, a significant difference was observed, unlike the results obtained from the study conducted by Kesim *et al*. (2016) but similar to results obtained from a study conducted among the Japanese population wherein increased BMI was associated with increased risk of periodontitis (2011). These results were also contradicting those obtained by a study conducted on the US adolescent aged between 13-16 years showed no relationship between weight and periodontal disease (Reeves *et al*., 2006). Also, the results obtained when the three categories were compared within the groups, the inference is similar to those obtained in a study by Amin *et al*. (2010), but contradicts the results of the study done in the Turkish population (Kuriyan *et al*., 2011), wherein the CPI scores of boys were influenced by their BMI and waist circumference and not the girls. This contradiction can be due to an increased sample size. However, the results also showed that the healthy boys and girls had a lower BMI and waist circumference when compared to unhealthy children that were in concordance with results obtained in other studies (Kuriyan *et al*., 2011; Ekuni *et al*., 2008; Scorzetti *et al*., 2013). This study is an initiative to evaluate the relationship between obesity and periodontal health of children in this population, which to our knowledge has never been explored within the South Indian population. However, to obtain accurate mechanism between obesity and periodontal health may be studied in a much efficient way with the help of a longitudinal study using a cohort and the findings from this study can be used as a stepping stone in further investigations to understand the mechanism that initiates and helps in the progression of disease in an obese individual.

Conclusion: Since calculating BMI and measuring waist circumference are simple and accurate methods for assessing obesity, they can be utilized as tools for risk profiling among the children due to the positive correlation with the periodontal status. This can aid in the prevention as well as diagnostic and treatment planning in children and adolescents.

REFERENCES

Al-Zahrani, M. S., Bissada, N. F. & Borawskit, E. A. 2003. Obesity and periodontal disease in young, middle-aged, and older adults. *Journal of Periodontology,* 74, 610–615.

Amin Hel S. 2010. Relationship between overall and abdominal obesity and periodontal disease among young adults. *East Mediterr Health J*., 16:429-33.

Ayhan H, Suskan E, Yildirim S. 1996. The effect of nursing or rampant caries on height, body weight and head circumference. *J Clin Pediatr Dent*., 20:209–212

Centre for disease control and prevention. CDC Child-Teen BMI Calculator :https://nccd.cdc.gov/dnpabmi/calculator.aspx

Ekuni D, Yamamoto T, Koyama R, Tsuneishi M, Naito K, Tobe K. 2008. Relationship between body mass index and periodontitis in young Japanese adults. *J Periodontal Res.,* 43:417-21.

Genco, R. J., Grossi, S. G., Ho, A., Nishimura, F.& Murayama, Y. 2005. A proposed model linking inflammation to obesity, diabetes, and periodontal infections. *Journal of Periodontology*,76,2075–2084.

Hujoel, P. 2009. Dietary carbohydrates and dental-systemic diseases. *Journal of Dental Research*, 88, 490–502.

Irigoyen-Camacho ME, Sanchez-Perez L, Molina-Frechero N, Velazquez-Alva C, Zepeda-Zepeda M, Borges-Yanez A. 2014. The re- lationship between body mass index and body fat percentage and periodontal status in Mexican adolescents. *Acta Odontol Scand*., 72:48-57.

Kesim, Servet, *et al*. 2016. "Oral Health, Obesity Status and Nutritional Habits in Turkish Children and Adolescents: An Epidemiological Study." *Balkan Medical Journal,* 33.2; 164.

Kuriyan, R., Thomas, T., Lokesh, D.P. *et al*. 2011. *Indian Pediatr*., 48: 765. doi:10.1007/s13312-011-0126-6

Kwan S. and Petersen PE. 2003. Oral health promotion: an essential element of a health-promoting school. Geneva, WHO. Available via WHO. http://www.who.int/ oral_ health/publications/doc11/en Accessed 2 Sept 2009

Larson NI. and Story M 2007. The pandemic of obesity among children and adolescents: what actions are needed to reverse current trends? J Adolesc Health 41:521–522

Petersen PE. 2003. The World Oral Health Report, continuous improvement of oral health in the 21st century—the approach of the WHO Global Oral Health Programme. *Community Dent Oral Epidemiol*., 31(Suppl 1):3–23

Pischon, N., Heng, N., Bernimoulin, J. P., Kleber, B. M., Willich, S. N. & Pischon, T. 2007, Obesity, inflammation, and periodontal disease. *Journal of Dental Research,* 86, 400–409.

Reeves AF, Rees JM, Schiff M, Hujoel P. 2006. Total body weight and waist circumference associated with chronic periodontitis among adolescents in the United States. *Arch Pediatr Adolesc Med*., 160:894-9.

Scorzetti L, Marcattili D, Pasini M, Mattei A, Marchetti E, Mar-zo G. 2013. Association between obesity and periodontal disease in children. *Eur J Paediatr Dent.,* 14:181-4.

Sheiham A. and Watt RG 2000. The common risk factor approach: a rational basis for promoting oral health. *Community Dent Oral Epidemiol*., 28:399–406

Visha, M. G., and Deepa Gurunathan.2016. "Relationship of BMI and dental caries among children in Chennai." www.biomedicineonline.org 36.1, 57.

****