

Original Research

To evaluate the correlation between obesity and periodontitis

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ABSTRACT:

Aim: To evaluate the correlation between obesity and periodontitis. **Methods:** This cross-sectional research was conducted. Individuals with 2 proximal sites with CAL 6 mm not on the same tooth and 1 proximal site with PD 5 mm were classified as having severe periodontitis, according to the CDC-AAP case classification. Obesity was identified as an exposure factor. Normal (BMI between 18.50 and 24.99), overweight (BMI between 25.00 and 29.99), and obese (BMI 30.00) were the classifications for the participants. BMI was computed by dividing the weight in kilogrammes by the height in metres squared (kg/m²). Individuals who were underweight or needed antibiotic prophylaxis before to a periodontal examination, as well as those who had other systemic conditions deemed to be risk factors for periodontal diseases (including diabetes), were eliminated. This research covered 100 patients. **Results:** The study involved 100 people, including 30 obese, 35 overweight, and 35 normal-weight adults. Bivariate analysis revealed that severe periodontitis was not linked with obesity (OR = 1.16, 95% CI = 0.41–3.71, p = 0.52). Bivariate analyses, however, revealed that severe periodontitis was linked with obesity (OR = 3.14, 95 percent CI = 1.42–7.08, p = 0.008), as well as higher plaque index values (OR = 4.03, 95 percent CI = 1.56–11.60, p = 0.005) and education (OR = 4.32, 95 percent CI = 1.73–11.94, p = 0.01). After controlling for variables, severe periodontitis was linked with obesity (OR = 3.35, 95 percent CI = 1.37–8.41, p = 0.01) and a lower educational level (OR = 4.47, 95 percent CI = 1.63–13.47, p = 0.01). **Conclusion:** Obesity was shown to be related with severe periodontitis. Given the complicated and multifaceted nature of obesity and periodontitis, it is advised that afflicted individuals be educated about the relationship between these two disorders.

Keywords: Periodontitis, Obesity

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INTRODUCTION

Obesity is part of the first wave of a defined cluster of noncommunicable illnesses known as the New World Syndrome, which is causing a massive socioeconomic and public health burden. Obesity has been identified by the World Health Organization (WHO) as one of today's most overlooked public health issues, impacting every part of the planet. ¹

It is linked to greater morality and is a risk factor for various chronic health disorders. Obesity has a number of unfavourable health consequences, including hypertension, high cholesterol, heart disease, type 2 diabetes, stroke, some malignancies, and periodontal disease. It is currently regarded the sixth most important risk factor leading to illnesses globally, and it has been proposed that growing levels of obesity may result in lower life expectancy in the future. ²

It causes immuno-inflammatory changes, and the illness has also been related to periodontitis, a disease of the tooth-supporting structures caused by the interaction of pathogenic bacteria and a host immunological response. Periodontitis is a complex condition. Many systemic or local risk variables play a significant influence in its clinical processes. Periodontal diseases are also influenced by various risk factors such as ageing, smoking, oral hygiene, socioeconomic status, genetics, race, gender, psychosocial stress, osteopenia, osteoporosis, and various other systemic diseases such as type 2 diabetes mellitus and cardiovascular disease, indicating that periodontitis does not occur solely as a result of plaque deposition but is also associated with a variety of host factors that may alter the outcome of the disease. ^{3,4}

Several studies from throughout the globe have regularly shown a link between widespread

periodontal disease and obesity. Linden et al. discovered no link between obesity in early adulthood and the severity of periodontitis at the age of 60–70 years, but Morita et al. discovered a link between periodontal disease and BMI 6 years earlier.⁵ Until far, the majority of obesity-related research have been conducted on adults and the elderly.⁶ Infection, chronic inflammation, and genetic susceptibility have all been proposed as mediators in this association. Nutrition has been proposed as an alternate mediator to these two. The body mass index (BMI) has long been thought to be a straightforward technique for assessing dietary health. This index has a typical range of 20 to 25 kgmsq, which corresponds with body fat.⁷

METHODS AND MATERIALS

This cross-sectional research was conducted. Individuals with 2 proximal sites with CAL 6 mm not on the same tooth and 1 proximal site with PD 5 mm were classified as having severe periodontitis, according to the CDC-AAP case classification.¹⁷ Obesity was identified as an exposure factor. Normal (BMI between 18.50 and 24.99), overweight (BMI between 25.00 and 29.99), and obese (BMI 30.00) were the classifications for the participants. BMI was computed by dividing the weight in kilogrammes by the height in metres squared (kg/m²). Individuals who were underweight or needed antibiotic prophylaxis before to a periodontal examination, as well as those who had other systemic conditions deemed to be risk factors for periodontal diseases

(including diabetes), were eliminated. This research covered 100 patients.

A single inspector took anthropometric measures such as weight (kg) and height (m). For all periodontal exams, one calibrated periodontist (TMS) was supported by one trained undergraduate student from the dentistry department. The intra class correlation coefficient (ICC) demonstrated intra examiner repeatability on the site level for probing depth (PD) (ICC = 0.85) and the distance between the cemento-enamel junction and the free gingival margin (CEJ-GM) (ICC = 0.92). The clinical attachment level (CAL) was determined by adding the PD and CEJ-GM values (ICC = 0.86).

RESULTS

The study involved 100 people, including 30 obese, 35 overweight, and 35 normal-weight adults. Bivariate analysis revealed that severe periodontitis was not linked with obesity (OR = 1.16, 95% CI = 0.41–3.71, $p = 0.52$). (Table 2). Bivariate analyses, however, revealed that severe periodontitis was linked with obesity (OR = 3.14, 95 percent CI = 1.42–7.08, $p = 0.008$), as well as higher plaque index values (OR = 4.03, 95 percent CI = 1.56–11.60, $p = 0.005$) and education (OR = 4.32, 95 percent CI = 1.73–11.94, $p = 0.01$). (Table 2). After controlling for variables (education and plaque index), severe periodontitis was linked with obesity (OR = 3.35, 95 percent CI = 1.37–8.41, $p = 0.01$) and a lower educational level (OR = 4.47, 95 percent CI = 1.63–13.47, $p = 0.01$).

Table 1: Demographic profile of the patients

Parameter	Normal weight=35	Overweight=35	Obese=30	Total	p-value
Gender					
Female	25	24	21	70	0.62
Male	10	11	9	30	
Age (years)					
Below 30	20	22	20	58	0.11
Above 30	15	17	10	42	
Education					
Up to 12 th	5	6	8	19	0.39
Graduate	30	29	22	81	
Income					
BPL	19	18	13	50	0.43
APL	16	17	17	50	
Plaque index					
Below 40%	31	32	21	84	<0.001
Above 40%	4	3	9	16	
Severe periodontitis					
No	30	32	23	85	0.03
Yes	5	3	7	15	

Table 2: Bivariate analysis of the association of periodontal risk factors

Parameter	Periodontitis N (%)		Odds ratio (95% CI)	p-value
	No	Yes		
Female	58	12	0.71 (0.30-1.96)	0.42
Male	27	3		

Age (years)				
Below 30	51	7	1.78 (0.84-3.93)	0.18
above 30	34	8		
Education				
Up to 12 th	16	3	4.32 (1.73-11.94)	0.01
Graduate	69	12		
Income				
BPL	39	11	2.71 (1.15-6.58)	0.42
APL	46	4		
Plaque index (%)				
Below 40	74	10	4.03 (1.56-11.60)	0.005
Above 40	11	5		
Obese				
No	55	7	3.14 (1.42-7.08)	0.008
Yes	30	8		
Overweight				
No	60	8	1.16 (0.41-3.71)	0.52
Yes	35	7		

DISCUSSION

Obesity has become more prevalent in recent years, and it is one of the world's fastest rising health-related issues. Obesity and overweight have been linked to periodontitis, perhaps because obesity might impair systemic health by increasing the host's vulnerability to periodontitis through inflammatory mediators. In this research, there was a clear link between obesity and periodontitis. Obese people had a threefold increase in the risk of severe periodontitis. Different processes may explain the link between these disorders. Adipose tissue secretes many pro-inflammatory cytokines and hormones that are implicated in periodontitis inflammatory processes and may exacerbate periodontal damage.⁸ Obesity may also alter the production and release of critical defence cells, including as neutrophils, which are known as the periodontal tissues' first line of defence, and T and B lymphocytes, which are responsible for cellular and humoral responses.⁹ Obesity is a condition of low-grade chronic inflammation that renders obese and overweight persons more vulnerable to infectious infections than those of normal weight.¹⁰ However, it is likely that there is no link between body weight and periodontal infection. Obesity and periodontal diseases share risk factors, such as bad lifestyle and diabetes,^{11,12} which may explain the presence of a relationship between them. It is also conceivable that any cause-and-effect link between periodontal disorders and obesity is the inverse of what is often supposed, i.e. periodontal infection causes obesity. Obesity was not linked to periodontitis in this research. This might be linked to two facts. First, overweight people had a lower plaque index than obese people. Obesity, in and of itself, does not promote pathologic periodontal modifications in animals under healthy oral settings; nonetheless, in response to bacterial plaque buildup, periodontal inflammation and destruction are more severe in obese animals. Second, a combination of risk factors is proposed to cause the most severe

periodontal consequences.¹³ It is conceivable that the current sample's overweight people were not exposed to additional risk factors such as hypertension.

Periodontitis is a complex illness influenced by a variety of risk variables, including the patient's age, socioeconomic position, biofilm control level,¹⁴ and characteristics not included in the current population, such as smoking behaviours and diabetes.¹¹ Age, biofilm control, and socioeconomic status were not linked with severe periodontitis in the current sample's multivariable analysis. Otherwise, lower education level was related with severe periodontitis, showing the powerful influence of socioeconomic variables and lifestyle on periodontal health status.¹⁵ However, BMI should be regarded as a rough estimate since it may not equate to the same degree of overweight in various people. Because the correlations between BMI, percentage of body fat, and body fat distribution varied between populations, there has been a rising discussion in recent years over the necessity for adopting distinct BMI cut-off points for different ethnic groups.¹⁶ As a result, health hazards may rise below the 30 kg/m² cut-off point.

CONCLUSION

Obesity was shown to be related with severe periodontitis. Given the complicated and multifaceted nature of obesity and periodontitis, it is advised that afflicted individuals be educated about the relationship between these two disorders. Other investigations are needed to determine if the association between periodontal disease and obesity is causative.

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