

Table 1. Evidence-Based Studies of Association Between Periodontal Disease and Obstructive Sleep Apnea

Author	Aim	Study/ Sample	Evaluated Parameters	Diagnosis or risk for OSA	Results	Conclusion
Loke et al. 2015	Investigated whether OSA has any association with periodontitis	-Cross-sectional -A total of 100 patients were included	PD, GR CAL, BOP and PI	Polysomnography	Moderate to severe periodontitis was verified in 73% Between the AHI groups, no significant differences were found in the prevalence of periodontitis. After adjusting for age, they found a significant association between the AHI severity categories and % of sites with plaque.	The author did not find significant association. Only found a significant association with the % of plaque
Seo et al. 2012	Evaluate the prevalence of periodontitis in patients with OSA.	-Cross-sectional -Total of 687 participants	PD, GR, CAL, BOP, GI and PI	Polysomnography	According to the results 17.5% of the participants had periodontitis.	The authors found a significant relationship between OSA and periodontitis
Keller et al. 2012	Assess the association between OSA and periodontitis	-Population based case-control -Study population: 29,284 sampled	PD, BOP, radiographic and tooth mobility	Polysomnography	There was a significant difference in the prevalence of periodontitis between cases and controls (33.8% versus 22.6%, $P < 0.001$).	The authors found an association between OSA and periodontitis
Gunaratnam et al. 2009	Assess the association between OSA and periodontitis	-Cross-sectional -Study population: 66 (54 men and 12 women)	PD, GR, CAL, BOP, GI and PI	Polysomnography	The prevalence of periodontitis ranged between 77%–79%,	OSA is associated with periodontitis.
Gamsiz-Isik et al. 2016	Evaluate if periodontitis is more prevalence in patients with OSA when compared with control patients	-Case-control -Study population: 163 individuals: 83 individuals (18 females; 65 males) with OSA and 80 non-OSA individuals (23 females; 57 males) as controls.	PD, CAL, BOP, GI and PI	Polysomnography	Periodontitis in the OSA group was detected in 96.4% and was significantly higher than in the control group 75%, ($P < 0.001$).	Higher prevalence of periodontitis and higher levels of GCF, IL-1 β and serum CRP in OSA patients.
Nizam et al. 2015	Evaluate the association between OSA and periodontitis through saliva, biomarkers, and subgingival bacteria.	-A preliminary case-control study -Study population: 52 patients were grouped according to the severity of OSA: 13 participants served as control patients, 17 patients had mild-to-moderate OSA, and 22 severe OSA.	PD, CAL, BOP Serum, saliva, and subgingival plaque samples were collected Salivary, serum concentrations of (IL-6, TNF- α , and RANKL)	Polysomnography	The different cytokines were detected with higher concentration in the OSA groups, but there was no statistical significance.	OSA appeared to correlate with increasing periodontal disease severity.

AHI - apnea-hypopnea index; BOP – Bleeding on Probing; CAL- Clinical attachment level; CRP- C-reactive protein; CP- Chronic Periodontitis; GCF- Gingival crevicular fluid; GI- Gingival index; GR- Gingival Recession; IL-6 – interleukin 6; IL-1 β - Interleukin 1 beta; OSA- Obstructive sleep apnea; PD- Probing depth; PI- Plaque index; RANKL, receptor activator of nuclear factor kappa B ligand; TNF- α - tumor necrosis factor alpha;