This work was approved by the Ethics Committee of Çankırı Karatekın University Scientific Research Evaluation Ethical Committee (No:41, Date:26.09.2022). The study's participants were CP+HNC post-RT (*n*=50), CP without HNC (*n*=50), and periodontally healthy as a control (*n*=50). CP+HNC post-RT patients were selected among those who received radiotherapy and attended to Cancer and Tumors Center/ Anbar Cancer Center (ACC), Iraq. CP without HNC patients was selected from Ramadi Specialized Dental Center (RSDC), Iraq was performed from September 2022 to January 2023. Exclusion and inclusion criteria were enrolled. Patients were diagnosed with HNC by an oncologist at Cancer and Tumors Center according to the National Comprehensive Cancer Network (NCCN)[1]. A single experienced oral hygienist (E. R.) examined clinical periodontal parameters. About (5-7ml) of venous blood was drawn by using a plastic syringe from all cases and control. Then, the sample was placed into a gel tube and left to clot at room temperature for about (15-20 minutes). The specimens were centrifuged at 3000 rpm for 10 minutes. Serum levels of Vitamin D were determined using modern electrochemiluminescence immunoassay technique (eCLIA), Nipigon Health corp, Ontario, Canada. The assay was performed according to the specifications of the manufacturer. When p <0.05, differences were deemed statistically significant. Both GraphPad Prism (version 9.5.1, La Jolla, California, USA) and IBM SPSS (version 27, NY, USA) were used to process all of the analyses.

[1] A. D. Colevas *et al.*, "NCCN guidelines insights: head and neck cancers, version 1.2018," *Journal of the National Comprehensive Cancer Network,* vol. 16, no. 5, pp. 479-490, 2018.