ABSTRACT

Background: The successful placement of dental implant largely depends on the properties of alveolar bone at the recipient site. Systemic conditions such as diabetes mellitus could impair bone quality and compromise implant treatment. However, limited information in this area exists so far. The objective of the study is to use cone beam computed tomography (CBCT) to assess mandibular bone mineral density (BMD) in diabetic and non-diabetic populations.

Methods: The patients who had CBCT scans in the school from 2011-2015 were screened, and 14 diabetic and 14 non-diabetic patients with matched age, gender, and ethnicity were recruited. BMD was measured on reconstructed CBCT sagittal views at 7 mm² rectangular areas on 6 sites for each patient. For cortical bone, BMD was measured at the inferior border of mandible in the midline and between the first and second premolar bilaterally. For cancellous bone, BMD was measured in the midline of mandible halfway between the lingual foramen/canal and the inferior border of mandible, and at the premolar area halfway between the mandibular canal and the inferior border of mandible bilaterally. For diabetic patients, the glycosylated hemoglobin (HbA1c) values were obtained after informed consent. Statistical significant difference as set at p <0.05. The correlation between BMD and the age, gender, and HbA1c value of the patients was analyzed. An institutional IRB approval was obtained for the study.

Results: Diabetic patients had significantly lower cancellous BMD than non-diabetic subjects in the posterior mandibles (367 vs. 430, p<0.05). For both groups, cancellous BMD in the posterior mandible was significantly lower than that of anterior mandible.

Conclusions: Diabetic patients have decreased BMD in the posterior mandible which could adversely affect implant placement at these areas.

KEY WORDS

Bone mineral density, diabetes mellitus, cone beam computed tomography, implant