

LETTER TO EDITOR

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Reply to Letter to the Editor on the Work “Can Torque Force During Dental Implant Placement Combined with Bone Mineral Density of Lumbar Spine Be Prediction Factors for Crestal Bone Structure Alterations?” (Dental and Medical Problems 2014, 51, 448–457)

**Odpowiedź na list do redakcji dotyczący pracy Marcina Kozakiewicza
i wsp. „Czy moment siły przy wprowadzaniu wszczepu zębowego
w połączeniu z gęstością kości kręgosłupa lędźwiowego
może być czynnikiem przewidywania zmian struktury
brzegu kości wyrostka zębodołowego?”
(Dental and Medical Problems 2014, 51, 448–457)**

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A – research concept and design; B – collection and/or assembly of data; C – data analysis and interpretation;
D – writing the article; E – critical revision of the article; F – final approval of article

Key words: bone mineral density, entropy, dental implants.

Słowa kluczowe: gęstość mineralna kości kręgosłupa, entropia, implanty dentystyczne.

Osteoporosis is a bone disease characterized by low bone mineral density (BMD) and deterioration of bone tissue microarchitecture. It weakens the bones, increasing the risk of fracture. It is estimated that osteoporosis affects 35% of the European Union population [1]. Since osteoporosis is typically asymptomatic until a fracture occurs, it often progresses undiagnosed. Pathologic fractures decrease the quality of life, mainly on the health level, and increase mortality rates. Dual-energy X-ray absorptiometry (DXA) is the “gold standard” for diagnosis of osteoporosis. DXA bone densitometry is a simple, quick, and non-invasive procedure. Despite the advantages of DXA, it requires a certified radiologic technician and expensive equipment (DXA scanner).

Along with the advancement of radiological techniques within the area of dentistry, a correlation between decreased bone mineral density and specific textural parameters visible on panoramic X-rays was noted [2–5]. In the past 10 years, mandibular cortical width (MCW) measurements were elaborated on with the aim of identifying a group of high-risk patients who have low BMD noticeable on panoramic X-rays. [6, 7]. Dutra et al. [8], as well as Ledgerton et al. [9] showed that the mental foramen region well represents systemic bone mineral density. The latest surveys dealt with advanced textural parameters visible on dental panoramic radiographs. The correspondence between MCW and fractal dimensions (FD) may help to di-

agnose osteoporosis [10, 11]. The combination of textural parameters, like gray level co-occurrence matrix (GLCM) and MCW, better contributes to detecting osteoporosis than any single factor mentioned above [12].

There are studies examining intraoral X-rays, where a tie between textural image parameters and the decrease of BMD was observed [13, 14]. Other studies – which contributed to establishing the aluminum wedge standard of exposition in the case of bone decalcification – were conducted due to intraoral X-rays of the body [15]. It is possible to estimate BMD on the grounds of textural parameters visible on intraoral X-rays; the method at hand is comparable to examination with screening for osteoporosis [16].

For the authors of this letter, any data on disorders of the BMD obtained from panoramic radiographs is valuable, evident, and unequivocal. However, it is worth noting that similar information may be obtained from intraoral X-rays – by

comparing the absorbed doses that are lower than in the case of panoramic X-ray or cone beam computer tomography (CBCT). In this kind of radiograph, the data at hand is enough to build a mathematical model [17]. Drawing on such a model, the authors of this letter are now creating maps of textural features – which will correspond to systemic bone mineral density – in order to reference a bone on intraoral X-rays.

In the era of the rapid development of oral implantology, any data on bone metabolism may serve as an applicative indicator in planning complex therapy. Further studies aimed at predicting local bone metabolism and bone retention after implantation are needed.

We would like to stress that a common belief in the superiority CBCT and panoramic X-rays have over standardized intraoral radiograph does not cover all scientific and clinical modalities while examining the alveolar crest, but is obviously popular nowadays.

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