Dentistry and Osteoporosis: What Should the Upcoming Research Focus on?

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Abstract

There are many published papers on the alternations of jawbone subsequent to osteoporosis. The majority of these studies aimed to detect differences in jawbone between osteoporosis and non-osteoporosis groups. Such differences were suggested as tools for opportunistic screening of osteoporosis. for opportunistic screening of osteoporosis purposes. These differences were reported, mainly, in the basal bone of the jaws. On the other hand, few numbers of studies assessed the effect of osteoporosis medications on jawbones. Basal bone was also the area where such changes were investigated. Little studies were performed to evaluate changes of the alveolar bone among osteoporotic patients under anti resorption medications therapy or not, although most dentists' interventions involve the alveolar bone, not the basal bone of the jaws.

Introduction

Osteoporosis is a skeletal disease characterized by a low bone mass, deterioration of the bone structure, and an increased risk of bone fracture [1]. A less substantial decrease in bone mass is termed osteopenia [2]. Bisphosphonates, which is a bone anti-resorption, proved to be effective in reducing bone fragility fractures [3]. Nevertheless, bisphosphonates-related osteo necrosis of the jaws (BRONJ) is an annoying and painful side effect associated with bisphosphonate therapy [4]. As a systemic disease, osteoporosis caused alternations in jawbones. Many studies tried to detect these changes, and use them in the opportunistic screening of osteoporosis.

The inferior cortex of the mandible was the most common location of the jaws which was assessed amongst osteoporotic patients. A decrease in the thickness of the inferior cortex of the mandible was found by these studies [5]. Nevertheless, it was found that mandibular cortical index (MCW), which had the highest accuracy of osteoporosis prediction from dental images in comparison to the other dental imaging-based osteoporosis screening indices, had an accuracy equal to 78.3% [5]. Mandibular cortical index (MCI) had also relatively high accuracy for predicting osteoporosis which was equal to 64.8%. Measuring the MCW on panoramic radiographs requires length calibration, which is not performed in the routine panoramic radiography. Some studies evaluated whether general practitioners can be trained to predict the presence of osteoporosis based on MCI. They reported that minimal training in assessing the MCI (such as what may be given a lecture format) was ineffective, and was associated with poor inter observer agreement and limited diagnostic validity in identifying the signs of osteoporosis [6,7]. Regarding the alveolar bone, the impact of osteoporosis itself on alveolar bone is still unclear with many conflicting results [5,8,9].

In addition, a recent paper evaluated the published papers and found that the majority of the published papers had not followed the STARD criteria (standards for reporting of diagnostic accuracy) [5]. In other words, many important statistical analyses were not performed.

The little number of studies that evaluated the effect of bisphosphonates on jawbones were also restricted on the mandibular cortical width [10,11]. Again, the alveolar bone was not investigated on patients using bisphosphonates for osteoporosis.

It should not be overlooked that most dentists' interventions involve the alveolar bone, not the basal bone of the jaws. Furthermore, alveolar bone assessment is crucial as the success of most, if not all, dental treatments requires healthy alveolar bone. For example, in Tam et al. [12] study, BRONJ was induced following dental implantation for patients under oral bisphosphonate for osteoporosis; however, this complication was not induced after dental implantation in other studies [13,14].

Conclusion

Accordingly, it is better to re-arrange our research strategy on osteoporosis. Predicting osteoporosis from dental images is important, however, it is more important to assess changes in the alveolar bone among osteoporotic patients under bisphosphonates therapy. or not Studying the alveolar bone is more complicated and time consuming than studying the basal bone of the jaws, especially on computed tomography sections. In addition, many confounding factors are involved in the alveolar bone, such as the periodontal disease, the occlusal forces, the number of remaining teeth, etc. However, it is important to understand how healing process differs among osteoporotic patients under anti-resorption medications or not. The basal bone of the jaws, though it is important, it is not the location where dental treatments are performed, so the alveolar bone should also be evaluated and thoroughly investigated among those patients.

It is also important to evaluate the dental treatments given for those patients in comparison to non-osteoporotic patients. Furthermore, finding statistical significant difference between osteoporotic and non-osteoporotic groups is not the ultimate aim of the studies related to opportunistic screening of osteoporosis. STARD criteria should be followed to have a thorough evaluation to the index under evaluation.

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