Knowledge, Attitude, and Management of General Dentist toward Medication-related Osteonecrosis of the Jaws

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INTRODUCTION

Osteonecrosis of the jaw (ONJ) is due to lack of blood supply, which eventually makes exposed bone nonvital. ONJ may either result from radiation therapy to the jaw termed as osteoradionecrosis (ORN) or adverse reaction to certain drugs such as bisphosphonate (BP), sunitinb, and denosumab.

A necrosis condition found in patients with intravenous or oral forms of BP therapy for various bone-related conditions is known as bisphosphonate-related osteonecrosis of the jaw (BRONJ). This manifests in maxillofacial structures as exposed and nonvital bone.[1]

Table 1: Access this article online

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The American Association of Oral and Maxillofacial Surgeon (AAOMS) changed the term of BRONJ to MRONJ in 2014 to accommodate the increasing number of the drugs causing osteonecrosis of jaw including denosumab, bevacizumab, and sunitinb.[2]

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Bisphosphonate (BP), an antiresorptive drug, acts as osteoclast function inhibitor which is led to decrease bone remodeling.\[^3\] BP is effective against several conditions such as hypercalcemia of malignancy, multiple myeloma, and osteoporosis\[^4,5\] in addition to skeletal-related events associated with metastatic bone disease along with solid tumors such as prostate, breast, lung cancers, and renal cell carcinoma.\[^6\] The oral form of BP is used to treat osteoporosis, osteogenesis imperfecta, osteopenia in addition to Paget’s disease.\[^7-10\]

Another antiresorptive has been found known as RANK ligand inhibitor (denosumab) as class of monoclonal antibody which function to inhibit osteoclast\[^2\] in turn reducing the resorption and improve the bone mass.

Antiangiogenic medication comes in two classes: the first is monoclonal antibodies (bevacizumab), which acts by binding to the vascular endothelial growth factor (VEGF) to prevent formation of new blood vessels and subsequently prevents its association with endothelial receptors. The second is tyrosine kinase inhibitor (e.g., sunitinib), which inhibits the tyrosine kinase receptor; both medication is antiangiogenic that has been believed to facilitate the antineoplastic agents delivery.

Assessment of the risks for the patients using antiresorptive drug or antiangiogenic drug depends on type and duration of treatment and underlying medical condition. The severity of MORNJ patients was classified according to the history, types of drug duration, and any adjunctive drugs.

However, the definitive treatment of MORNJ has not yet been fully discovered. So in this condition, the prevention is highly recommended and essential to avoid further complication of MORNJ. As there is no study found to evaluate the knowledge attitude and management about MORNJ toward general dental practitioner (GDP) and interns in Saudi Arabia, the aim of the study was to assess the knowledge and attitude of dental practitioners of Saudi Arabia toward MORNJ.

**Materials and Methods**

After obtaining permission from King Khalid Hospital, Al-Kharj, a questionnaire survey was conducted by interview and web-based to a random sample of dentist in Saudi Arabia, which includes information about MORNJ, opinions, and how to treat patient presenting with MORNJ. The study is designed to evaluate the knowledge, practice, and management by general dentist toward MORNJ patients. The inclusion criteria of the study were general dentists and the exclusion criteria of the study were dental specialist, students, and interns.

Informed consent was taken from each subject during answering the questionnaire. People denying giving consent were excluded. This study was a cross-sectional study. It was conducted among 20–50 years old people. A close-ended questionnaire was designed with 15 questions. Questions were explained whenever necessary and the participants were given assurance regarding the confidentiality of their responses and were requested to mark their answers and complete it individually.

The descriptive statistics were analyzed and all responses were expressed in form of frequencies and percentages. Comparisons were done by using chi-square test and Pearson correlation test using Statistical Package for the Social Sciences (SPSS, IBM SPSS Statistics for Windows, version 23 (IBM Corp., Armonk, N.Y., USA)) for Windows.

**Results**

Table 1 shows knowledge score of participants. On the basis of knowledge scores, participants were categorized into poor (<50% of score), fair (50%–75%), and good (>75%). Majority of practitioners (60%) were found to have poor knowledge levels regarding MORNJ. Mean knowledge was found to be 6.09 ± 2.1.

Table 2 shows association between gender and knowledge level, which was statistically significant ($\chi^2$, $df = 8.92$, $P = 0.012$). Men had much poor knowledge than women.

Table 3 shows that there was not any statistically significant association between age groups and knowledge level ($\chi^2$, $df = 12.482$, $P = 0.052$).

Table 4 shows statistically significant association between workplace and knowledge level ($\chi^2$, $df = 15.682$, $P = 0.0001$). Government workplace participants had higher knowledge levels than private.

Table 5 shows a two-tailed Pearson correlation test, which revealed that there is very weak positive relation between knowledge scores and experience in years which was found to be statistically nonsignificant ($r = 0.074$, $P = 0.293$).

| Knowledge level | Frequency | Percent |
|-----------------|-----------|---------|
| Poor            | 124       | 59.9    |
| Fair            | 78        | 37.7    |
| Good            | 5         | 2.4     |
| Total           | 207       | 100.0   |
**DISCUSSION**

In Jana Mexican study, 99.7% of dentists and specialists showed lack of sufficient knowledge to diagnose and manage BRONJ.\(^{[11]}\) This was much higher compared to this study.

A study conducted in Ontario showed that 60% of participants have good knowledge toward BRONJ. Although 50% of the participant was not comfortable to treat patient taking BP, 63% would refer the any patient taking BP.\(^{[12]}\) This was similar to this study. A study conducted on students in Italy showed 99% of participants declared to know BPs and fourth-term students had better knowledge compared to fourth-term students.\(^{[13]}\) On the contrary, in this study, there is a weak correlation between knowledge and number of years of experience. A study conducted in Spain showed that knowledge of side effects of antiresorptive drugs decreases with increasing years of professional practice.\(^{[14]}\) Other study showed that oral maxillofacial surgeons have more knowledge compared to general dentists.\(^{[15]}\)

All these differences may be due to variation in the way of teaching and the level of knowledge obtained in different countries. Some studies have also insisted on effective professional patient education and prevention of developing MRONJ.\(^{[16]}\)

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**CONCLUSION**

A better knowledge in future may lead to minimize incidence of MRONJ, as well as a better clinical and legal solution for ONJ cases. Properly trained dental professionals reduce the possibility of legal cost and damages. As it also affects quality of life, appropriate preventative education is required and a periodic reinforcement of the same is necessary to enhance the clinical and competency education of the individual.

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**Conflicts of interest**

There are no conflicts of interest.
REFERENCES

1. Kurien J, Sunil EA, Mukunda A, Philip SR. An update on bisphosphonate-related osteonecrosis of the jaw. Indian J Clin Pract 2013;24:267-70.

2. Ruggiero SL, Dodson TB, Fantasia J, Goodday R, Aghaloo T, Mehrdota B, et al.; American Association of Oral and Maxillofacial Surgeons. American Association of Oral and Maxillofacial Surgeons position paper on medication-related osteonecrosis of the jaw–2014 update. J Oral Maxillofac Surg 2014;72:1938-56.

3. Migliorati CA, Casiglia J, Epstein J, Jacobsen PL, Siegel MA, Woo SB. Managing the care of patients with bisphosphonate-associated osteonecrosis: an American Academy of Oral Medicine position paper. J Am Dent Assoc 2005;136:1658-68.

4. Nussbaum SR, Younger J, Vanden Wyngaert T, Delforge M, Doyen C, Duck L, Wouters K, Delabaye I, et al. Prospective observational study of treatment pattern, effectiveness and safety of zoledronic acid therapy beyond 24 months in patients with multiple myeloma or bone metastases from solid tumors. Support Care Cancer 2013;21:3483-90.

5. Watts NB. Bisphosphonate treatment of osteoporosis. Clin Geriatr Med 2003;19:395-414.

6. Bishop N, Adam S, Ahmed SF, Antón J, Arundel P, Burren CP, et al. Risedronate in children with osteogenesis imperfecta: a randomised, double-blind, placebo-controlled trial. Lancet 2013;382:1424-32.

7. Ralston SH, Langston AL, Reid IR. Pathogenesis and management of Paget's disease of bone. Lancet 2008;372:155-63.

8. Marx RE, Cillo JE Jr, Uloa AJ, Cillo RE. Oral bisphosphonate-induced osteonecrosis: risk factors, prediction of risk using serum CTX testing, prevention, and treatment. J Oral Maxillofac Surg 2007;65:2397-410.

9. Vinitzky-Brener I, Ibáñez-Mancera N-G, Álvarez-Jardón A-P. Knowledge of bisphosphonate-related osteonecrosis of the jaws among Mexican dentists. Med Oral Patol Oral Cir Bucal 2017;22:e84-7.

10. Alhussain A, Peel S, Dempster L, Clokie C, Azarpazhooh A. Knowledge, practices, and opinions of Ontario dentists when treating patients receiving bisphosphonates. J Oral Maxillofac Surg 2015;73:1095-105.

11. Escobedo M, García-Consuegra L, Junquera S, Olay S, Ascani G, Junquera L. Medication-related osteonecrosis of the jaw: a survey of knowledge, attitudes, and practices among dentists in the principality of Asturias (Spain). J Stomatol Oral Maxillofac Surg 2018;119:395-400.

12. Al-Samman AA, Al-Ani RS. Cross-sectional survey on medication-related osteonecrosis of the jaws' knowledge and awareness in a sample of dental society. J Cranio-Maxillofac Surg 2019;47:926-31.