

Knowledge of Bisphosphonate and Medication-Related Osteonecrosis of the Jaw (MRONJ) among dentists in Southeastern Brazil: a cross-sectional study

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Abstract:

Objective: This study aimed to evaluate the level of knowledge among dentists in Minas Gerais, Brazil, regarding bisphosphonates and their association with MRONJ, with emphasis on risk perception, preventive measures, and diagnostic awareness. **Methods:** This was a descriptive, cross-sectional, and quantitative study approved by the Research Ethics Committee of the Federal University of Uberlândia (protocol no. 6.135.292). A total of 95 dentists registered with the Regional Council of Dentistry participated by completing a structured online questionnaire. **Results:** While 69.5% of respondents reported knowing what bisphosphonates are, 83.2% recognized the risks of MRONJ in oral surgical procedures, and 87.4% were aware of the high likelihood of osteonecrosis in patients using these drugs. However, only 47.4% reported knowledge of preventive strategies, and 50.5% were familiar with clinical signs and symptoms used for diagnosis. **Conclusions:** Although dentists demonstrated general awareness of bisphosphonate-related osteonecrosis, significant knowledge gaps remain regarding its prevention and diagnostic criteria. These findings underscore the need for enhanced continuing education and training in evidence-based protocols to improve clinical outcomes and reduce complications associated with antiresorptive therapy in dental practice.

Keywords: Bisphosphonates; Osteonecrosis; Medication-related osteonecrosis, Oral surgery, Clinical Management.

INTRODUCTION

Medication-related Osteonecrosis of the Jaw (MRONJ) is a serious complication associated with the use of antiresorptive and antiangiogenic agents, including bisphosphonates and denosumab, drugs widely used to treat diseases such as multiple myeloma, bone metastasis of solid tumors, osteoporosis, and osteopenia^{1,2}. Antiresorptive medications, such as bisphosphonates, primarily act by inhibiting bone resorption, thereby increasing bone density³. This action occurs through the apoptosis of osteoclasts, the cells responsible for bone resorption, which reduces bone turnover and may compromise bone fragility, especially in the maxilla and mandible^{4,5}. Importantly, the route of administration also plays a significant role in the likelihood of developing MRONJ, with intravenous bisphosphonates being associated with a substantially higher risk compared to oral formulations, particularly in oncology patients^{1,4}.

Statement of Clinical Significance

Dentists' effective MRONJ prevention requires identifying bisphosphonate patients, assessing risk, carefully planning invasive procedures, collaborating interprofessionally on medication suspension, and implementing preventive protocols. Strengthening dentists' knowledge is essential to minimize complications, safeguard patient safety, and optimize long-term clinical outcomes.

When accumulated in toxic levels in the bone due to prolonged use, these drugs may undermine the survival of osteoclasts and their precursor cells, contributing to the development of osteonecrosis, defined by the exposure of necrotic bone in the maxillary or mandibular region for at least eight weeks^{6,7}.

Although MRONJ is a rare adverse event, its prevalence varies considerably according to the clinical context. Estimates indicate rates of 0.001 to 0.01% among patients undergoing therapy for osteoporosis and other

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low-dose conditions, while in oncology patients — who typically receive higher-potency antiresorptive regimens—prevalence may reach 1 to 10%^{1,4}. MRONJ most commonly develops after dental procedures such as tooth extractions in susceptible individuals^{1,2}. Risk factors most frequently associated with osteonecrosis include the concomitant use of bisphosphonates with dental extraction, therapy with pamidronate or zoledronic acid, advanced age, and prolonged medication use^{4,8}. The literature on the association between bisphosphonates and osteonecrosis of the jaw was consolidated by Marx⁶ in 2003, and numerous studies have addressed this issue since then, emphasizing the importance of proper patient management when using these drugs. Nevertheless, despite growing awareness, there remains a significant knowledge gap amongst dental practitioners, particularly regarding early diagnosis and effective prevention of MRONJ^{9,10}.

The dental surgeon's education about the adverse effects of bisphosphonates is crucial, as a delayed or negligent diagnosis can lead to irreversible complications for the patient, negatively affecting their quality of life. Recent studies show that dental surgeons' knowledge about the risks of MRONJ is still insufficient, which may result in poor management of patients undergoing bisphosphonate treatment¹⁰⁻¹². Proper identification of clinical signs, a thorough patient history, and the ordering of complementary exams are essential for early diagnosis and the prevention of serious complications^{8,13}.

Therefore, the aim of this study is to assess the level of knowledge of dental surgeons in Minas Gerais about bisphosphonates and MRONJ, to identify gaps in understanding and promote awareness for the implementation of effective preventive practices. It is expected that this will contribute to improving dental care, avoiding complications, and promoting oral health in patients who use these drugs. This study seeks not only to provide insight into dental practitioners' current knowledge but also to underscore the importance of continuing education and staying up to date in dental practice, thereby ensuring better outcomes for their patients.

MATERIALS AND METHODS

The methodology of this study was conducted through an online questionnaire, accessible via a link that was sent by email to dentists in Minas Gerais. Because the invitations were distributed directly by the Regional Dental Council (CRO-MG), it was not possible to determine the exact number of professionals who received

the email or opened the questionnaire link. According to the Federal Council of Dentistry, on March 30, 2023, the number of registered dentists in Minas Gerais was 47,068. Although no formal sample size calculation was performed, the estimate of 100 participants was based on a commonly acceptable margin of error between 7 and 10% for exploratory surveys with large populations. This number was also considered achievable considering the expected response rate for email-based questionnaires sent to healthcare professionals. Even with the wide distribution carried out by the Regional Dental Council (CRO-MG), obtaining a larger number of responses proved challenging, which is consistent with the low adherence usually reported in voluntary online surveys. Therefore, the researchers aimed to obtain 100 valid responses for analysis.

The questionnaire link was sent by email through the regional professional council with participants' emails entered in blind carbon copy (BCC) to ensure privacy and prevent exposure of other professionals' information. The questionnaire was hosted on the Google Forms platform, and access to it was permitted only after participants read and agreed to the Informed Consent Form (ICF). Participants could optionally provide an email address to receive a copy of the ICF. The questionnaire consisted of eight objective questions, with answers limited to "yes" or "no." These questions were formulated to evaluate dentists' knowledge regarding the use of bisphosphonates, the risk of developing MRONJ, and considerations related to performing oral surgical procedures in patients exposed to these drugs. Topics covered included medication associated with MRONJ, recognition of medical history relevance, and preventive measures related to osteonecrosis of the jaw.

After data collection, the results were tabulated in Excel[®] and stored locally, with all data subsequently deleted from the online platform and any associated cloud storage. Descriptive statistics, including absolute and relative frequencies, were calculated to summarize participants' responses.

This study was submitted to and approved by the Research Ethics Committee of the Federal University of Uberlândia (CEP/UFU), under CAAE number 6.135.292.

RESULTS

Because the invitations were distributed directly by the Regional Dental Council (CRO-MG), it was not possible to determine the exact number of professionals who received the email or accessed the questionnaire

link. A total of 100 dentists completed the survey and were included in the final analysis. No demographic data (such as age or sex) were collected.

Descriptive analysis of the eight questionnaire items revealed that affirmative responses (“Yes”) were predominant, with a mean of 64.1 answers per question (SD=21.8), ranging from 27 to 88. Negative responses (“No”) had a mean of 30.5 (SD=21.9), ranging from 6 to 68. Non-responses were minimal, averaging 0.375 per item (SD=0.52), with only one question receiving a blank response.

Table 1 summarizes the distribution of responses across the eight questionnaire items. In general, most participants demonstrate awareness of MRONJ and the relationship between bisphosphonate use, and the risks associated with oral surgical procedures.

DISCUSSION

The findings of this study indicate that dental surgeons in Minas Gerais demonstrate a generally satisfactory awareness of MRONJ, particularly in terms of disease recognition (92.6%) and its association with oral surgical procedures in patients using bisphosphonates (83.2%). These findings reveal a higher level of awareness compared to previous Brazilian data, such as Sático et al.¹⁰, who reported 56.7% of professionals familiar with MRONJ in the Northeast region, and international studies like Al-Eid et al.¹⁴, who found only 60.8% awareness among Saudi professionals. Similarly, Guler et al.¹⁵ observed that 88.5% of Turkish dentists recognized

bisphosphonates as a potential cause of exposed bone areas in clinical scenarios, aligning with our data. Shapurwala et al.¹⁶ had similar results (about 85%) in India, but highlighted a significantly higher awareness among those with over 20 years of experience and oral maxillofacial surgery specialists.

Despite this general awareness, important deficiencies were observed in the domains of prevention and early diagnosis. In our study, less than half of the respondents reported knowledge of preventive procedures (47.4%) and diagnostic criteria based on signs and symptoms (50.5%). These findings are consistent with de Sático et al.¹⁰ and, Sousa et al.¹⁷ who emphasized that fewer than half of Brazilian dentists possess sufficient knowledge for effective diagnosis and prevention of MRONJ. Internationally, Vinitzky-Brener et al.¹⁸ reported that only 40.5% of dental specialists were adequately aware of bisphosphonate-related complications. Bival et al.¹⁹, assessing Croatian dentists, observed that 66.2% were unaware of the need to discontinue bisphosphonate therapy prior to dental surgery, and only 30.6% correctly identified procedures to reduce risk. Albu-Stan et al.²⁰ found that while many dentists in Romania have heard about bisphosphonates and their complications, they often lacked awareness of the fundamental concepts related to prevention and treatment protocols for MRONJ.

Although some aspects of MRONJ pathophysiology remain under investigation, it is important to note that internationally recognized diagnostic criteria, staging systems, and management recommendations do exist, particularly those published in the 2022 AAOMS

Table 1. Distribution of dentists’ responses (n=95) regarding their knowledge of bisphosphonates and medication-related osteonecrosis of the jaw.

Question	Yes (%)	No (%)	No answer (%)
1. Do you know what MRONJ is?	88 (92.6)	6 (6.3)	1 (1.1)
2. Are you familiar with the main drugs classified as bisphosphonates?	66 (69.5)	29 (30.5)	0 (0.0)
3. Do you know the potential complications when a patient on bisphosphonate therapy undergoes oral surgery?	79 (83.2)	15 (15.8)	1 (1.1)
4. Are you aware that patients on bisphosphonates are at increased risk of developing medication-related osteonecrosis of the jaw following oral surgical procedures?	83 (87.4)	12 (12.6)	0 (0.0)
5. When taking a patient’s medical history, do you routinely inquire about medications, including bisphosphonates?	77 (81.1)	18 (18.9)	0 (0.0)
6. Do you know which clinical measures are recommended to prevent MRONJ?	45 (47.4)	50 (52.6)	0 (0.0)
7. Are you able to recognize the clinical signs and symptoms that meet the diagnostic criteria for MRONJ?	48 (50.5)	46 (48.4)	1 (1.1)
8. Have you ever managed or encountered a case of MRONJ in your clinical practice?	27 (28.4)	68 (71.6)	0 (0.0)

Note: Percentages may not total 100% due to rounding.
MRONJ: medication-related osteonecrosis of the jaw.

Position Paper²¹. Therefore, instead of the absence of standardized protocols, the challenge seems to lie in the limited dissemination and incorporation of these guidelines into daily clinical practice. This gap between theoretical knowledge and clinical implementation increases the risk of severe complications and delayed intervention, thereby negatively affecting prognosis and quality of life²². Marx⁶ demonstrated that the lack of preventive care correlates with higher incidence and severity of MRONJ. Martins et al.⁴ also stressed the complexity of prevention protocols and the need for interdisciplinary management, especially in resource-constrained settings.

A significant concern was the low frequency of reported clinical experience: 71.6% of respondents in our study had never encountered a case of MRONJ. This may reflect both the true low prevalence of the disease and underdiagnosis, as previously suggested by Al-Eid et al.¹⁴, who found only 9.5% of dentists had clinically observed such cases. Guler et al.¹⁵ uncovered that prior clinical experience with MRONJ significantly impacted knowledge and clinical behavior, including the routine inquiry about bisphosphonate use during anamnesis. Bival et al.¹⁹ also noted that less experienced and recently graduated dentists had better knowledge scores, possibly reflecting more updated curricular content.

The lack of integration between dentistry and other health disciplines further complicates prevention efforts. Acharya et al.²³ showed that while 76.2% of physicians acknowledged MRONJ as a side effect, only 49.2% considered dental referral mandatory before initiating bisphosphonate therapy, with significant variability depending on specialty. Sahu et al.²⁴ similarly found that more than half of the practitioners did not recommend oral health screening prior to initiating treatment, despite recognizing the risks associated with dental procedures.

As an additional consideration, the geographic scope of this study represents a limitation. Because the sample was restricted to dentists from southeastern Brazil, a region with distinct socioeconomic characteristics and a highly concentrated dental workforce, the findings may not necessarily reflect the reality of professionals in other parts of the country. Brazil's continental dimensions and marked regional disparities could influence access to continuing education, exposure to complex clinical cases, and familiarity with updated guidelines. Future studies including broader and more diverse samples are needed to better understand the national scenario.

Taken together, these findings reinforce the global relevance of the issue and the urgent need for targeted educational strategies²⁵. Strengthening undergraduate and postgraduate curricula²⁶, promoting continuing education²⁷, and fostering interprofessional collaboration are essential steps²⁸. Educational tools such as clinical flowcharts and evidence-based guidelines may improve decision-making, reduce uncertainties^{29,30}, and standardize care, as suggested by de Sátiro et al.¹⁰.

CONCLUSION

This study assessed the level of knowledge of dental surgeons in Minas Gerais regarding bisphosphonates and MRONJ, highlighting that although general awareness of MRONJ and its risks is relatively high among professionals, there are still important gaps in the understanding and application of preventive measures and early diagnosis. This gap between what professionals know and what is implemented in clinical practice reinforces the need to strengthen continuing professional education and promote the integration of updated protocols into daily dental practice. As similar issues have also been observed in national and international studies, the results reinforce the global relevance of the topic and emphasize the importance of developing educational strategies that encourage interprofessional collaboration and a more preventive approach, aiming to improve patient outcomes and reduce complications related to bisphosphonate therapy in dentistry.

AUTHORS' CONTRIBUTIONS

CMM: Data curation, Formal analysis, Visualization, Writing – original draft. CRM: Conceptualization, Formal analysis, Investigation, Methodology, Project administration, Supervision, Validation, Writing – review & editing. CSS: Conceptualization, Formal analysis, Investigation, Methodology, Project administration, Supervision, Validation, Writing – review & editing. SVC: Conceptualization, Formal analysis, Investigation, Methodology, Project administration, Supervision, Validation, Visualization, Writing – review & editing. MCPS: Supervision, Validation, Writing – review & editing.

CONFLICT OF INTEREST STATEMENT

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REFERENCES

- Migliorati CA, Casiglia J, Epstein J, Jacobsen PL, Siegel MA, Woo SB. Managing the care of patients with bisphosphonate-associated osteonecrosis. *J Am Dent Assoc.* 2005;136(12):1658-68. <https://doi.org/10.14219/jada.archive.2005.0108>
- AlDhalaan NA, BaQais A, Al-Omar A. Medication-related osteonecrosis of the jaw: a review. *Cureus.* 2020;12(2):e6944. <https://doi.org/10.7759/cureus.6944>
- Limones A, Sáez-Alcaide LM, Díaz-Parreño SA, Helm A, Bornstein MM, Molinero-Mourelle P. Medication-related osteonecrosis of the jaws (MRONJ) in cancer patients treated with denosumab VS. zoledronic acid: a systematic review and meta-analysis. *Med Oral Patol Oral Cir Bucal.* 2020;25(3):e326-36. <https://doi.org/10.4317/medoral.23324>
- Martins MAT, del Giglio A, Martins MD, Pavesi VCS, Lascala CA. Osteonecrose dos maxilares associada ao uso de bisfosfonatos: importante complicação do tratamento oncológico. *Rev Bras Hematol Hemoter.* 2009;31(1):41-6. <https://doi.org/10.1590/S1516-84842009005000008>
- Querrer R, Ferrare N, Melo N, Stefani CM, Reis PED, Mesquita CRM, et al. Differences between bisphosphonate-related and denosumab-related osteonecrosis of the jaws: a systematic review. *Support Care Cancer.* 2021;29(6):2811-20. <https://doi.org/10.1007/s00520-020-05855-6>
- Marx RE. Pamidronate (Aredia) and zoledronate (Zometa) induced avascular necrosis of the jaws: a growing epidemic. *J Oral Maxillofac Surg.* 2003;61(9):1115-7. [https://doi.org/10.1016/s0278-2391\(03\)00720-1](https://doi.org/10.1016/s0278-2391(03)00720-1)
- Seo DD, Borke JL. Medication-related osteonecrosis of the jaw – 2024 update. *Oral Health Dental Sci.* 2024;8(1):1-6.
- Jelin-Uhlig S, Weigel M, Ott B, Imirzalioglu C, Howaldt HP, Böttger S, et al. Bisphosphonate-related osteonecrosis of the jaw and oral microbiome: clinical risk factors, pathophysiology and treatment options. *Int J Mol Sci.* 2024;25(15):8053. <https://doi.org/10.3390/ijms25158053>
- Bouزيد S, Makhoulouf Y, Miladi S, Fazaa A, Boussaa H, Souabni L, et al. Dentists' misconceptions regarding bisphosphonate therapy in everyday practice. *Ann Rheum Dis.* 2024;83(Suppl 1):2192-3. <https://doi.org/10.1136/annrheumdis-2024-eular.5412>
- Sátiro VDS, Silva JH, Campos JCML, Silva Filho AR, Barbosa JVP, Bartasson KV, et al. Bisfosfonatos: avaliação do conhecimento dos cirurgiões-dentistas. *RECIMA21.* 2022;3(8):e381846. <https://doi.org/10.47820/recima21.v3i8.1846>
- González-Navarro B, Arranz-Obispo C, Albuquerque R, Jané-Salas E, López-López J. Osteomyelitis of the jaw (with pathological fracture) following extraction of an impacted wisdom tooth. A case report. *J Stomatol Oral Maxillofac Surg.* 2017;118(5):306-9. <https://doi.org/10.1016/j.jormas.2017.05.003>
- Alencar VRCT, Paulino MR, Alencar IALM, Ribeiro-Filho J, Braz AVO, Matias EFF, et al. Assessing dental surgeons' understanding of bisphosphonates: Implications for patient health in oral surgery. *Saudi Dent J.* 2024;36(1):180-6. <https://doi.org/10.1016/j.sdentj.2023.09.011>
- Payne KF, Goodson AM, Tahim AS, Rafi I, Brennan PA. Why worry about bisphosphonate-related osteonecrosis of the jaw? A guide to diagnosis, initial management, and referral of patients. *Br J Gen Pract.* 2017;67(660):330-1. <https://doi.org/10.3399/bjgp17X691565>
- Al-Eid R, Alduwayan T, Khuthaylah MB, Al Shemali M. Dentists' knowledge about medication-related osteonecrosis of the jaw and its management. *Heliyon.* 2020;6(7):e04321. <https://doi.org/10.1016/j.heliyon.2020.e04321>
- Guler R, Yalcin E. Evaluation of the awareness and knowledge levels of dentists regarding bisphosphonates and bisphosphonate-related jaw necrosis. *J Craniofac Surg.* 2025;36(4):e376-82. <https://doi.org/10.1097/SCS.00000000000010870>
- Shapurwala MA, Kharkar V, More S, Kalsi H, Sachdev SS. Knowledge and awareness of medication-related osteonecrosis of the jaw among dental practitioners in Mumbai: a questionnaire-based survey. *Cureus.* 2024;16(12):e76448. <https://doi.org/10.7759/cureus.76448>
- Sousa SRC, Pinheiro JC, Felipe Junior J, Farias DM, Almeida DRMF, Lima JGDC, et al. Avaliação do grau de conhecimento dos Cirurgiões Dentistas sobre a utilização dos bisfosfonatos e seus efeitos adversos: estudo descritivo. *Res Soc Dev.* 2021;10(6):e20110615693. <https://doi.org/10.33448/rsd-v10i6.15693>
- Vinitzky-Brener I, Ibanez-Mancera NG, Aguilar-Rojas AM, Álvarez-Jardón AP. Knowledge of bisphosphonate-related osteonecrosis of the Jaws among Mexican dentists. *Med Oral Patol Oral Cir Bucal.* 2017;22(1):e84-7. <https://doi.org/10.4317/medoral.21433>
- Bival S, Šimović L, Blažun A, Bergman L, Vražić D, Granić M. Dentists' awareness of medication-related osteonecrosis of the jaw (risk factors, drugs, and prevention) in the Republic of Croatia. *Acta Stomatol Croat.* 2023;57(2):121-32. <https://doi.org/10.15644/asc57/2/3>
- Albu-Stan IA, Petrovan C, Cerghizan D, Eremie LY, Crăciun AE, Copotioiu C. Knowledge and attitude of dentists regarding patients undergoing bisphosphonate treatment: a comparative questionnaire. *J Interdiscip Med.* 2018;3(3):169-72. <https://doi.org/10.2478/jim-2018-0027>
- Ruggiero SL, Dodson TB, Aghaloo T, Carlson ER, Ward BB, Kademani D. American Association of Oral and Maxillofacial Surgeons' position paper on medication-related osteonecrosis of the jaws-2022 update. *J Oral Maxillofac Surg.* 2022;80(5):920-43. <https://doi.org/10.1016/j.joms.2022.02.008>
- Miranda-Silva W, Montezuma MA, Benites BM, Bruno JS, Fonseca FP, Fregnani ER. Current knowledge regarding medication-related osteonecrosis of the jaw among different health professionals. *Support Care Cancer.* 2020;28(11):5397-404. <https://doi.org/10.1007/s00520-020-05374-4>
- Acharya S, Patil V, Ravindranath V, Kudva A, Nikhil K. Medication-related osteonecrosis of the jaw: knowledge and perceptions of medical professionals on the usage of bone modifying agents and dental referrals. *J Med Life.* 2022;15(3):368-73. <https://doi.org/10.25122/jml-2021-0085>
- Sahu KK, Johnson ED, Butler K, Li H, Boucher KM, Gupta S. Improving bone health in patients with metastatic prostate cancer with the use of algorithm-based clinical practice tool. *Geriatrics (Basel).* 2022;7(6):133. <https://doi.org/10.3390/geriatrics7060133>

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25. Patel N, Seoudi N. Management of medication-related osteonecrosis of the jaw: an overview of National and International Guidelines. *Br J Oral Maxillofac Surg.* 2024;62(10):899-908. <https://doi.org/10.1016/j.bjoms.2024.08.008>
 26. Hariri F, Hassan MK, Kallarakkal TG. Painless and exposed bone in the maxilla: medication-related osteonecrosis of the jaw (MRONJ). In: Tilakaratne WM, Kallarakkal TG, eds. *Clinicopathological correlation of oral diseases*. Cham: Springer International Publishing; 2023. p. 519-28. https://doi.org/10.1007/978-3-031-24408-7_46
 27. Hochmuller M, Velaski DP, Koth VS, Barbieri S. Diagnóstico, tratamento e prevenção da osteonecrose maxilar relacionada a medicamentos. *Rev Bras Multidisciplinar.* 2021;24(2):233-47. <https://doi.org/10.25061/2527-2675/ReBraM/2021.v24i2.1132>
 28. Berger S, Goetz K, Leowardi-Bauer C, Schultz JH, Szecsenyi J, Mahler C. Anchoring interprofessional education in undergraduate curricula: the Heidelberg story. *J Interprof Care.* 2017;31(2):175-9. <https://doi.org/10.1080/13561820.2016.1240156>
 29. Yarom N, Shapiro CL, Peterson DE, Van Poznak CH, Bohlke K, Ruggiero SL, et al. Medication-related osteonecrosis of the jaw: MASCC/ISOO/ASCO clinical practice guideline. *J Clin Oncol.* 2019;37(25):2270-90. <https://doi.org/10.1200/JCO.19.01186>
 30. Priyadarshini V, Ramachandra SS, Ganganna A. Awareness and attitude among physicians regarding bisphosphonate-related osteonecrosis of the jaw (BRONJ): a cross-sectional study. *Curr Drug Saf.* 2023;18(3):361-7. <https://doi.org/10.2174/1574886317666220514160507>