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Comparing Prevalence of Medication-Related Osteonecrosis of the Jaw (MRONJ) due to Denosumab and Bisphosphonates as a Side Effect of Osteoporosis Treatment

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Abstract

As the baby boomer generation continues to age, the diagnosis of osteoporosis and its side effects will continue to increase. Denosumab and bisphosphonates (BPs) are some of the most common medication classes used to treat osteoporosis and osteoporosis, but it is believed that both medications have the possible side effect of medication-related osteonecrosis of the jaw (MRONJ). The purpose of this paper is to uncover if MRONJ is a side effect of osteoporosis treatment and which medication carries the highest incidence rate. Through a review of several electronic databases and several peer reviewed research articles, a wide range of reported incidence rates of MRONJ for both medications were uncovered, along with many compounding possible risk factors. There is a wide range of reported incidence rates and definitions of MRONJ. Research found that denosumab carries a slightly higher risk of MRONJ versus bisphosphonates, but the difference was found to be statistically insignificant. Uncovered risk factors include increasing age, gender, recent dental procedures, history of oral disease, and corticosteroid use. My research is impactful in the fact that as providers, we can be better informed about the differences between denosumab and bisphosphonates and the possible risk factors of MRONJ. We can use the information, along with possible other risk factors and our patient’s history, to make joint decisions about what osteoporosis medication is right for our patients.

Keywords: osteonecrosis, jaw, medication-related, Bisphosphonates side effects, denosumab side effects, abnormal fracture, osteoporosis

Literature Review

- The world’s population is ageing: two factors—longer life spans and aging baby boomers—will combine to double the population of Americans aged 65 years and older during the next 25 years to about 72 million (CDC, 2013).

- This will have a significant impact on age-related health care; a loss of bone mineralization and mass in the forms of osteoporosis and osteoporosis being a major issue.

- Worldwide, osteoporosis causes more than 8.9 million fractures annually, resulting in an osteoporotic fracture every three seconds. (International Osteoporosis Foundation, 2017)

- In addition to the personal burden and impact on quality of life, the costs associated with fracture treatment are enormous. (International Osteoporosis Foundation, 2017)

- A study from 2002 estimated national health care expenditures due to osteoporosis fractures to be about $12 billion annually, with about 75% of the costs going to direct medical care (Deas, Duncan, Sloan, 2003).

- Denosumab and bisphosphonates are two of the most common pharmacologic treatments prescribed. However, both are not without their various side effects. Both medications are believed to have the possible side effect of osteonecrosis of the jaw, but this is believed to be very rare.

- MRONJ risk.
- Treatment.
- Treating versus the possible risks of treating.

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- Is the incidence rate of MRONJ greater in those patients treated with denosumab or bisphosphonates?

- Are there any precipitating factors or conditions that increases incidence rates of MRONJ with treatment of denosumab or bisphosphonates?

- Is the incidence rate of MRONJ greater in those patients treated with denosumab or bisphosphonates?

- A wide variety of incidences rates were reported with both denosumab and bisphosphonates. (Loyson et al, 2017)

- Several studies have reported a slightly higher rate with denosumab compared to BPs, but the differences are not statistically significant. (Berenson, Stupack, 2017).

- Table 1: Disease frequency of MRONJ reported by various studies

- In one study, the reported one year mortality after sustaining a hip fracture was as high as 20% (Berkdale et al, 2016).

- There are many different treatment options for osteoporosis, among them BPs and denosumab, and there is not one is-size fits all solution.

- In any situation, we as providers have to be able to weigh the benefits of treating versus the possible risks of treating.

- We will need to take each patient’s preference and personal medical history into account to make a joint decision about osteoporosis treatment.

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