Teriparatide administration as an adjunctive treatment in BRONJ patients: a systemic literature review

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INTRODUCTION

Teriparatide (TPTD) is a synthetic version of the human parathyroid hormone and is currently the only anabolic agent approved by FDA, that directly stimulates bone formation. Findings have reported that TPTD is a clinically viable approach to increase bone regeneration against bone defects and fractures. Several trials have investigated the efficacy of TPTD administration to treat BRONJ (bisphosphonate related osteonecrosis of jaw) and disclosed favourable outcomes.

METHODS

Protocol of the review has been executed by using PRISMA approach and was submitted to PROSPERO. Electronic search was carried out in Medline, ScienceDirect, The Cochrane Library and LILACS databases using a combination of following keywords: "BRONJ", “TPTD”, “treatment”. To be included, the study had to be published less than 10 years ago and written in English. Publications that involved patients who had prior treatment with radiotherapy of head/neck region were excluded, as well as patients who were treated with glucocorticosteroids. The electronic search showed 2096 articles and eventually 7 articles were included. Number of patients in the included studies varied from 6 to 34 (a total of 139 patients in 7 studies) with patients mean age being 75,47 years. 90.5 % of patients received oral BPs, while 9.5 % received intravenous.

CONCLUSIONS

Study results have shown that administration of TPTD has a promising effect for BRONJ patients. Administration of TPTD improves resolution of BRONJ lesions, reduces bony defects, increases bone volume and bone resorption/regeneration marker values.

AIM

Determine whether administration of TPTD as an adjunct improves bone regeneration in patients diagnosed with BRONJ.

RESULTS

1. According to studies by Sim et al. and Kim et al., TPTD was statistically significantly associated with a greater BRONJ lesion resolution, compared to control group ($p<0.05$). However, study by Sim et al. showed no significant difference in proportion of resolved lesions ($p=0.478$). The case report that consisted of 8 patients showed that the administration of TPTD led to complete recovery of BRONJ lesions in 7 patients, while exhibiting coverage of the exposed bone by mucosa.
2. Regarding the effectiveness of TPTD treatment according to administration frequency, daily injection group showed no significant changes in the clinical stage of BRONJ, no difference in the percentage of bone formation on patients osteolysis, compared to weekly injection group.
3. Regarding bone resorption/regeneration markers, four of the included studies evaluated s-CTX levels, three of the included studies measured s-OC values. All studies showed that bone resorption markers significantly increased after 3 month TPTD administration. In a multivariate analysis using age, BMI, duration of BP usage, the difference in s-OC values after 3 months of the treatment between TPTD and non-TPTD groups were significant ($p<0.05$).