Tooth Extraction Socket Healing in Pediatric Patients Treated with Intravenous Pamidronate

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Osteonecrosis of the jaw (ONJ) has been described as a complication of bisphosphonate therapy in adults. In the present study, we did not find a case of ONJ among 278 pediatric patients who had received intravenous pamidronate during childhood or adolescence. (J Pediatr 2008;153:719-20)

C yclical intravenous therapy with pamidronate is used to strengthen the bones of children and adolescents with skeletal fragility, particularly those with osteogenesis imperfecta.1 However, several reports suggest that osteonecrosis of the jaw (ONJ)—clinically visible as exposed bone in the maxillofacial area—can be a complication of bisphosphonate therapy in adults.2-7 A working diagnosis of ONJ is made when there is no evidence of healing after 6 to 8 weeks of appropriate dental care and no evidence of metastatic disease or osteoradionecrosis in the jaw.8

In adults, a high incidence of ONJ (0.8% to 12%) has been reported in patients who received bisphosphonates intravenously in the context of treatment for oncologic disorders.3-5,9 ONJ seems to be much rarer in patients who receive oral or intravenous bisphosphonates to treat postmenopausal osteoporosis (0.00038% to 0.04%).5,10 Nevertheless, it appears that a dental extraction during bisphosphonate therapy increases the risk of ONJ by 8- to 10-fold.5

Even though ONJ has been described only in adults to date, it is our experience that many dentists are reluctant to perform dental extractions in children and adolescents who receive intravenous pamidronate therapy. Consequently, we assessed the frequency of ONJ in children and adolescents who were treated with pamidronate at our institution.

METHODS

Between October 1992 and December 2006, 338 pediatric patients received at least 1 cycle of intravenous pamidronate at the Shriners Hospital for Children in Montreal. For the purpose of the present study, we were able to contact 278 of these patients (142 females; 136 males). The majority of the patients had a diagnosis of osteogenesis imperfecta (n = 221); other diagnoses included fibrous dysplasia (n = 20), idiopathic juvenile osteoporosis (n = 14), neuromuscular disorders (n = 11), bone dysplasias (n = 8), rheumatologic disorders (n = 3), and Crohn’s disease (n = 1). The patients had received cyclical pamidronate infusions over a median period of 4.6 years (range of pamidronate exposure, 1 infusion to 11.2 years of regular infusions). The median age at follow up for this study was 14.7 years (range, 0.7 to 32 years).

The patients who had undergone dental extraction were asked for permission to obtain information from their dentists’ records. The study design was approved by McGill University’s Institutional Review Board. Informed written consent was obtained from all patients and/or legal guardians, as appropriate.

All patients had received pamidronate intravenously in cycles of 3 consecutive days, as described previously.1 The total annual pamidronate dose was 9 mg/kg body weight. For each patient who had undergone dental extractions, his or her chart was consulted for information on pamidronate therapy related to the extraction procedure. In addition, the treating dentist was contacted to obtain information on the extraction procedure and follow-up observations. Assessment of extraction socket healing was based on the treating dentist’s clinical notes on postoperative visits.
RESULTS

None of the 278 patients who could be contacted had a history of ONJ. Dental extractions had been performed on 113 patients during or after pamidronate treatment. None of the patients or their parents recalled postoperative complications after these extractions.

Chart data from the treating dentist could be obtained for 66 patients (25 females, 41 males; median age at follow up, 14.0 years; range, 2 to 30 years). The median cumulative dose of pamidronate before dental extraction was 40 mg/kg body weight (range, 2.5 to 81 mg/kg). The median duration of pamidronate treatment before dental extraction was 4.6 years (range, 0.3 to 9.0 years). These 66 patients had undergone a total of 250 tooth extractions (178 primary teeth, 72 permanent teeth). Indication for the dental extractions included impacted teeth (n = 35), fractured teeth (n = 13), decay or odontogenic abscess (n = 45), retained primary teeth (n = 80), bony ankylosis (n = 1), and ectopic eruption or preorthodontic therapy (n = 76). For 40 of the teeth, surgical extraction with flap elevation, bone removal, and tooth sectioning was required. Prophylactic antibiotic use was implemented for 41 dental extractions in 12 patients. A total of 163 teeth were extracted during active pamidronate treatment. The median intervals between the last pamidronate dose before dental extraction and the first pamidronate dose after dental extraction were 63 and 69 days, respectively. A total of 87 teeth were extracted a median of 2.0 years after the last dose of pamidronate.

For 225 of these extractions, the dentist’s follow-up data could be retrieved, with a median postoperative follow-up period of 86 days (range, 3 to 1370 days). In addition, follow-up by telephone was performed a median of 908 days (range, 45 to 3790 days) after dental extraction. Adequate healing was noted on postoperative visits in all patients, with no evidence of delayed healing, exposed bone, or ONJ.

DISCUSSION

In this study, we found no cases of ONJ among 278 patients who had received pamidronate at our institution, even though this group of patients had a number of risk factors for developing ONJ, such as dental extraction and prolonged exposure to intravenous pamidronate at relatively high doses. This exposure profile is similar to that of adult cancer patients who developed ONJ; however, a large majority of those adult patients also received treatment with chemotherapy and other concomitant medications, such as steroids, which are known risk factors for osteonecrosis. It is also possible that other factors, such as age, periodontal disease, and the underlying oncologic disease itself, may have played a role in the development of ONJ in those patients. The patient population in the present study did not have such comorbid conditions. Thus, our findings are compatible with the hypothesis that bisphosphonate therapy is only 1 of several factors that contribute to the development of ONJ.

In conclusion, we found no cases of ONJ in a pediatric population with pamidronate exposure. Our data do not suggest that dental extraction should be withheld because of previous pamidronate treatment in this population.

REFERENCES