

## The Association of Bisphosphonate Related Osteonecrosis of the Jaw with Children On Bisphosphonate Therapy

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### COLUMN ARTICLE

Bisphosphonate related osteonecrosis of the jaw (BRONJ) is a well recognised dental side effect of bisphosphonate therapy in adults [1]. BRONJ manifests as non-healing, exposed, necrotic bone in the jaw and mainly appear in patients taking high doses of intravenous bisphosphonates. Bisphosphonates are widely prescribed in benign and malignant bone diseases, such as osteoporosis, Paget's disease and metastatic cancers in adults. Recently, the use of bisphosphonates in children has increased and they are indicated for osteopathic conditions (osteogenesis imperfecta, fibrous dysplasia, juvenile osteoporosis, neurogenic osteopenia, Gaucher's disease), hypercalcaemic conditions (leukemias, bone marrow transplant, Williams syndrome, Guillain-Barre' syndrome), neuromuscular disorders, calcinosis or heterotopic ossification (myositis or fibrodysplasia ossificans, infantile arterial calcification, dermatomyositis, scleroderma). Bisphosphonates act by inhibiting osteoclast activity, resulting in gain in bone mass, increase in bone strength, and reduction in bone pain and in the risk of pathologic fracture. Despite the increase in the use of bisphosphonates in children, there are still no cases of BRONJ reported in children so far. This may suggest that children may have altered oral and dental BRONJ predisposing factors in comparison to adults.

After infusion, bisphosphonates are rapidly taken up by the bone cells and they remain bound to bone for a long

time (2-10 years) and are only liberated into the soft tissues during bone remodelling events [2]. It is unknown if bisphosphonates could affect the overall growth of the child, bones or dentition. However, it has been shown previously that the use of bisphosphonates could affect developing dentition and delayed exfoliation and eruption of teeth in an animal model [3]. Normally the dose of bisphosphonates used in children is lower compared with adults. However, this has to be kept in mind that bisphosphonate accumulate in the bone and are released over time following changes in bone remodelling. Children taking bisphosphonates should be considered as potentially at risk of developing BRONJ and should receive similar precautions as that of adults depending on the dose of the bisphosphonates and the type of dental treatment.

Considering the number of children on bisphosphonates and the morbidity of BRONJ, prevention should receive prime importance. It is important that health care professionals, including dentists, physicians and paediatric orthopaedists be aware of the possible complications of bisphosphonates including BRONJ. Prior to the beginning of bisphosphonate therapy, parents should be informed of the BRONJ related problem and all children should be screened for oral risk factors such as poor oral hygiene, carious lesions, and oral infections such as abscesses. Children should be instructed to maintain a good oral hygiene and undertake all necessary dental treatment before starting bisphosphonate therapy, for instance, restoration of carious lesions, endodontic treatment or extractions. If the

child is already on bisphosphonate, then prior to any dental intervention the use of oral antimicrobial mouth rinses (chlorhexidine 0.12%) or the use of antibiotics prophylaxis (penicillin or erythromycin) should be undertaken. It is crucial that the children taking high doses of intravenous bisphosphonates should be monitored periodically and a regular clinical and radiographic examination with the dentist should be carried out. Furthermore, the prospective clinical studies should be conducted in order to better evaluate the actual risk of BRONJ in this population.

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