

P636

Bisphosphonate therapy induced hypocalcemia in multiple myeloma patients

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Myeloma cells produce several local factors such as interleukin 1-beta, tumor necrosis factor alpha, and interleukin-6, which accompanied by local microenvironment, have a role in the pathogenesis of myeloma bone disease. Increased activity of these factors enhance the activity of osteoclasts, which results in hypercalcemia, osteoporosis and lytic bone lesions.

Bisphosphonates inhibit osteoclastic bone resorption, decrease levels of bone resorption cytokines which results in fewer lytic bone lesions and fewer skeletal events in patients with multiple myeloma.

Patients with pre-existing kidney injury should be closely monitored, and if there is a significant pre-existing renal impairment, bisphosphonates should not be given.

Literature data suggest close monitoring of serum and ionized calcium level as well as the vitamin D level. Most of the oncology patients have lower level of vitamin D for which they have to take vitamin D as supplementation therapy during cancer treatment.

Bisphosphonate can cause hypocalcemia which can be detected 7-10 days after the administration of drug. Some of the published case series reported significant symptomatic hypocalcemia after zoledronate administration where patients required calcium oral and intravenous supplementation.

It is very important to measure calcium, phosphate, magnesium and albumin levels in multiple myeloma patients who receive bisphosphonate. There are some reports about significant hypocalcemia in patients who undergo autologous stem cell transplantation, if they receive bisphosphonate few days before transplantation. Incidence of zoledronic acid accompanied hypocalcemia is about 30% according to some published reports.

Bisphosphonates are usually given for at least 2 years on a monthly basis, after which they can be administered every 2-3 months or until the patient shows a poor performance status.

It will be worthwhile to compare if short-term use of bisphosphonate therapy (less than 2 years) has the same efficacy and significantly less side effects in comparison to long-term use.