Chinese-German J Clin Oncol
DOI 10.1007/s10330-013-1266-z
April 2014, Vol. 13, No. 4, P197

Expert View

The application progress of diphosphonate in the treatment of breast cancer

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Received: 5 November 2013 / Revised: 20 November 2013 / Accepted: 14 March 2014

It has been proved that diphosphonate can be used in the treatment of skeletal related event (SRE) induced by bone metastasis of breast cancer and the prevention of SRE induced by bone metastasis of breast cancer. Therefore, for the patients with breast cancer and confirmed bone metastasis, diphosphonate could be used as basic treatment regimen.

Usage and precautions

Before the application of diphosphonate, the levels of serum electrolytes, particularly the creatinine, serum calcium and phosphoric acid shall be tested. The general conditions of the patients, overall condition of the disease and drug combination shall be considered during the application of diphosphonate. This drug could be used in combination with radiotherapy, chemotherapy, endocrinotherapy and analgesics. The 500 mg Ca and appropriate dose of Vitamin D supplement are necessary for the long term use of diphosphonate. For the patients with renal insufficiency, the dose of diphosphonate shall be reduced or the infusion time shall be prolonged according to the information of different products. Considering that a minority of patients were exposed to potential risks of osteonecrosis of the jaw after long term application of diphosphonate reported, oral cavity examination and appropriate prophylactic treatment shall be provided before medication. During the application, maintain oral hygiene and avoid the intraoral surgeries including tooth extraction. If there is exposed maxillofacial bone or healing problems without any obvious inducing factors during or after operation, see a doctor as soon as possible.

Medication time and drug-withdrawal

The median medication time of diphosphonate in the treatment of breast cancer and SRE prevention varies from 6–18 months in different clinical trials. Safety data of over 2 years had been obtained, therefore, in the clinical practice, 2 years or longer medication time is recommended. Nevertheless, a rational medication time shall be selected according to the safety of the patients and clinical benefits. This drug, sometimes, could be the only systemic medication for the bone metastasis patients after the chemotherapy. The drug shall be suspended under the following conditions: serious adverse events related to diphosphonate during the treatment; deterioration or left-threatening viscera metastasis; no further clinical benefits considered by the physician. The expert panel pointed out that the remission of bone pain through other treatment is not an indication of drug-withdrawal.

CTIBL induced by antineoplastic therapies

Cancer treatment-induced bone loss (CTIBL) is a serious clinical problem seen in patients of different ages after the chemotherapy and hormonotherapy, especially the application of ovarian function inhibitor and aromatase inhibitor (AI). ASCO guidelines for bone health in patients with breast cancer recommended: risk assessment of osteoporosis should be done on patient with breast cancer. High-risk patients include: patients over 65 years; 60–64 years with one of the following risk factors: family history of osteoporosis, body weigh < 70 kg, with a history of non-traumatic fracture or other pathological fracture induced by osteoporosis, postmenopausal women given AI treatment and premenopausal women given treatment may induce early menopause.

The function of diphosphonate in the prevention of bone metastasis

In vitro study showed that diphosphonate had antitumor effect. ZO-FAST and ABCSG-12 study indicated that Zoledronic acid could significantly reduce the risks of bone metastasis, and it also prevented potential visceral metastasis. The clinical study of diphosphonate in the prevention of bone metastasis of breast cancer is still undergoing, currently diphosphonate in the prevention of bone metastasis of breast cancer is not recommended.

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