Tumori, 98: 79-85, 2012

A feasibility study of neo-adjuvant low-dose fractionated radiotherapy with two different concurrent anthracycline-docetaxel schedules in stage IIA/B-IIIA breast cancer

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ABSTRACT

Aims and background. The aim of the study was to evaluate the feasibility of neoadjuvant low-dose fractionated radiotherapy, in combination with two anthracycline-docetaxel regimens, in breast cancer treatment.

Materials and methods. Women with stage IIA/B-IIIA breast cancer were assigned to receive the treatment of low-dose fractionated radiotherapy (0.4 Gy/per fraction, 2 fractions per day, for 2 days, every 21 days for 8-6 cycles) with concomitant neoadjuvant chemotherapy with non-pegylated liposomal doxorubicin and docetaxel. Two chemotherapy schedules were planned to be combined with low-dose fractionated radiotherapy. The first schedule consisted of four cycles of non-pegylated liposomal doxorubicin sequentially followed by four cycles of docetaxel, and the second schedule consisted of six cycles of non-pegylated liposomal doxorubicin plus concomitant docetaxel. Acute toxicity was evaluated according to the Radiation Therapy Oncology Group score system. Pathological response was evaluated by the Mandard score and expressed as tumor regression grade.

Results. Between March 2008 and February 2009, 10 patients underwent low-dose fractionated radiotherapy and concomitant chemotherapy. No grade 3-4 breast toxicity was observed. Five patients had a clinical complete response. Seven patients underwent conservative surgery. Overall, tumor regression grade 1 (absence of residual cancer) was achieved in one patient (10%) and grade 2 (residual isolated cells scattered through the fibrosis) in 4 patients (40%). The pathologic major response rate (tumor regression grade 1 + 2) was 20% in patients receiving low-dose fractionated radiotherapy and sequential non-pegylated liposomal doxorubicin and docetaxel and 80% in the group receiving low-dose fractionated radiotherapy and concurrent non-pegylated liposomal doxorubicin and docetaxel treatment.

Conclusions. Concomitant low-dose fractionated radiotherapy combined with anthracycline and docetaxel is feasible. The toxicity profile of radio-chemotherapy was similar to that of chemotherapy alone: there was no acute skin or cardiac toxicity. The concurrent application of liposomal doxorubicin and docetaxel with low-dose fractionated radiation led to higher histological response rates compared to the sequential application of the same two drugs.

Key words: acute toxicity, breast cancer, low-dose fractionated radiotherapy, neoadjuvant radio-chemotherapy, tumor regression grade (TRG).

Conflict of interest notification: The authors state that there are no actual or potential conflicts of interest.

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Received June 2, 2011;
accepted October 11, 2011.