ORIGINAL ARTICLE

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A clinical evaluation of FDG-PET to assess the response in radiation therapy for bronchogenic carcinoma

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The clinical usefulness of FDG-PET in the prediction and assessment of response to radiation therapy in patients with bronchogenic carcinoma was evaluated. Thirty patients with untreated bronchogenic carcinoma were included in the study. All patients received FDG-PET before the initiation of radiation therapy, while 20 also received it after completing the therapy. The tumor to muscle ratio (TMR) was used as an index of the FDG uptake. The tumor response to therapy was classified as either a partial response (PR, n = 21) or no change (NC, n = 9) according to changes in the tumor size. Prognosis was made 6 months after the initiation of therapy, and was classified as either relapse (n = 19) or non-relapse (n = 9). The FDG uptakes both before and after therapy were compared with tumor response and prognosis. A high FDG uptake was noted in all 30 lesions before therapy. No significant differences in the uptake before therapy was observed according to the histological types nor T factors (UICC). The lesions with a higher uptake (TMR more than 7) responded better to therapy than those with a lower uptake ($p < 0.05$). The decrease in the uptake after therapy tended to be more prominent in the PR group than in the NC group. The rate of relapse was higher in lesions with a higher uptake before therapy (TMR more than 10) than in those with a lower uptake. The relapse group also showed a higher uptake after therapy than the non-relapse group. In addition, all 6 lesions showing a higher uptake (TMR more than 5) after therapy eventually relapsed ($p < 0.05$). Two lesions demonstrating a lower uptake both before and after therapy did not relapse, although no tumor regression due to the therapy was observed. These results indicate that FDG-PET plays a complementary role in both predicting and assessing the therapeutic response and prognosis in patients with bronchogenic carcinoma.

Key words: positron emission tomography, F-18 fluorodeoxyglucose, bronchogenic carcinoma, radiation therapy, therapeutic response