

Response prediction with FDG-PET in mesothelioma patients treated with pemetrexed based chemotherapy

G. Vale Gomes (1); M. Rodari(2); L.G. Ceresoli(2); S. Tadayyon(2); E. Morengi(2); F. R. Lutman(2); G. L. Ciocia(2); M. Alloisio(2); A. Santoro(2); A. Chiti(2)

(1) Nucleos, Brasilia, Brazil

(2) Istituto Clinico Humanitas, Milano, Italy

Aim: Response evaluation in malignant pleural mesothelioma (MPM) using conventional criteria based on computed tomography (CT) is particularly difficult, due to its diffuse pattern of growth. Changes in tumor FDG uptake after therapy have been proposed to predict response and patient outcome early in the course of treatment. We aimed to evaluate FDG PET as a surrogate end-point of chemotherapy response in MPM.

Methods: Patients with histologically proven MPM, not candidates to curative surgery were eligible. Chemotherapy regimens were single agent pemetrexed at a dose of 500 mg/m² every 3 weeks or pemetrexed 500 mg/m² in combination with carboplatin both given on day 1, every 3 weeks. Treatment was repeated for 6 cycles or until progression or non acceptable toxicity. PET imaging was performed at baseline within 2 weeks before chemotherapy, and was repeated after two cycles. All patients were fasting and had plasma glucose lower than 150 mg/dL. Attenuation corrected whole body scans in 3D mode were acquired 60 min after administration of 250 to 450 MBq of FDG, using a Siemens ECAT Accel LSO scanner. Maximum standardized uptake value (SUV_{max}), corrected for patient's weight was independently measured by two observers on the area of highest tumor related metabolic activity. A decrease of $\geq 25\%$ SUV_{max} was defined as a metabolic response. Basal and contrast enhanced CT scans of chest and abdomen were performed at baseline and after every two cycles of chemotherapy, within 7 days of PET examination, on a Philips Aura

single slice spiral CT system. Best overall response was determined according to published criteria (JCO 2003;21:2636-44).

Results: Twenty-two patients were included and 20 were assessed for early metabolic response with FDG PET: 8 (40%) were classified as responders and 12 (60%) as non-responders. Early metabolic response was significantly correlated to median time to tumor progression (TTP); median TTP for metabolic responders was 14 months versus 7 months for non responders ($p=0.02$). On the contrary, no correlation was found between TTP and radiological response evaluated by CT.

Conclusion: Our data support the use of metabolic response evaluated by FDG PET as a surrogate end-point in MPM. Lack of metabolic response should represent a criterion for early switch to an alternative therapeutic approach.