Whole Body ^{18}FDG-PET Predicts Progression Free and Overall Survival in Patients with Squamous Cell Carcinoma of the Esophagus: A Prospective Trial

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Purpose

A previously published study suggested that measured of therapy induced changes in tumor glucose metabolism by positron emission tomography (PET) with the glucose analog ^{18}florodeoxyglucose (^{18}FDG) predicts the response, survival and recurrence in adenocarcinoma of esophagogastric junction. The aim of this study was to prospectively validate these findings in squamous cell carcinoma (SCC) of the esophagus.

Patients and Methods

Twenty one patients with squamous cell carcinoma of the esophagus who were potentially resectable were included in the study. All patients underwent ^{18}FDG-PET imaging before 1st cycle of neo-adjuvant chemotherapy and 14 days at least after the 3rd cycle. Patients were classified as metabolic responder when the metabolic activity of the primary tumor had decreased by 50% or more at the time of second ^{18}FDG-PET.

Results

The median age of the study cohort was 60 (+/-9.7) years, 12 patients were males and 9 were females. ^{18}FDG-PET demonstrated increase activity in the primary tumor in all patients. Metabolic response was shown in 14 patients (66%), while 7 patients didn't show metabolic response. Metabolic responders showed a high clinical response rate (92 %), median progression free survival (PFS) (16.4 months) and median overall survival (OS) (35.3 months). In contrast, prognosis was poor for metabolic non-responders with clinical response rate of 42% (p=0.025), median PFS of 7.13 months (p=0.032) and median OS of 12 months (p=0.038).

Conclusion

Current results demonstrate that changes in tumor metabolic activity after neo-adjuvant chemotherapy predicts PFS and OS in esophageal SCC patients. These data provide the basis of clinical trials in which early assessment with ^{18}FDG-PET could change the pre-operative treatment guided by the metabolic response.