Positron Emission Tomography can visualize pancreatic cancer tumor changes during chemotherapy and predict longer survival

Pancreatic cancer is one of the most deadly cancer types. Only 20% of patients live beyond 1 year after diagnosis because of the aggressive nature of this disease and ineffective treatments. Therefore it is crucial to recognize early if a therapy is helping patients. This research was conducted to understand if positron emission tomography (PET), a unique way for doctors to see tumors inside the body, can visualize changes in metastatic pancreatic cancer (tumors that have spread beyond the pancreas) during treatment with chemotherapy with either the combination of *nab*-paclitaxel plus gemcitabine or with gemcitabine alone. This study also evaluated if either or both of these therapies reduced tumor sizes, as seen by PET imaging, and if tumor reduction predicted extended survival.

In this study, 257 patients with previously untreated pancreatic cancer that has spread beyond the pancreas were randomly (ie, by chance) assigned to receive either *nab*-paclitaxel plus gemcitabine or gemcitabine alone. PET imaging was performed at the start of the therapy, at week 8 (approximately 2 months) after the start of chemotherapy, and at week 16 (approximately 4 months). If the total volume of tumors in each patient was reduced by over 25% after at least 2 months of therapy, the patient's tumors were considered together as "reduced". If the total volume of tumors in each patient had less than 25% reduction or any decrease, the tumors were not considered reduced.

The results showed that most patients had 5 measurable tumors as seen by PET imaging at the start of the chemotherapy. Regardless of which treatments patients received, if tumor reduction was observed at either 2 or 4 months after the initiation of the therapy, patient survival was approximately 60% longer than those without tumor shrinkage. Furthermore, PET imaging at 2 months identified over 5 as many patients with tumor reduction than traditional computed tomography (CT, 146 versus 27). This indicates that PET imaging may be a better method than CT to identify if a particular chemotherapy is effective. Additionally, tumor reduction as seen by PET at 2 months predicted longer survival.

This study also revealed that 40% more patients had reductions if they received *nab*-paclitaxel plus gemcitabine compared with those who received gemcitabine alone, suggesting that the combination of *nab*-paclitaxel plus gemcitabine can control pancreatic cancer progression more effectively.

In conclusion, the results of this study showed that PET imaging was a useful method to visualize how pancreatic tumors changed with treatment. More patients had tumor reduction if they received the combination chemotherapy with *nab*-paclitaxel plus gemcitabine. Tumor reduction as seen by PET imaging predicted extended survival.

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Publication

Positron emission tomography response evaluation from a randomized phase III trial of weekly nab-paclitaxel plus gemcitabine versus gemcitabine alone for patients with metastatic adenocarcinoma of the pancreas.

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