PET imaging could lead to better care for neuroendocrine cancer

June 11 2012

A method of molecular imaging that pinpoints hormonally active tissues in the body could change the course of treatment for a remarkable number of neuroendocrine cancer patients, say researchers at the Society of Nuclear Medicine's 59th Annual Meeting.

An investigation of a molecular imaging method used to evaluate neuroendocrine patients prior to treatment was found to change management in more than 35 percent of the patients following imaging.

Patients who were previously considered inoperable went on to have surgery, and patients with previously unknown and extensive cancer who were originally slated for surgery were considered inoperable. Ruling out surgery in cases that are unlikely to be treated successfully with resection saves patients from the stress and potential complications of unnecessary surgeries.

"The study shows that this particular molecular imaging technique does significantly change patient management, identifying operable and curable symptomatic patients or sparing patients from futile surgery," says Niklaus Schaefer, M.D., lead investigator at the University Hospital of Zurich in Zurich, Switzerland. "The positive impact on our patients is also significant. This serves as a model for further use of molecular imaging to assess neuroendocrine tumors."

Neuroendocrine tumors originate from cells of the neuroendocrine system, which regulates the effect of hormones in various organs

throughout the body where hormones are active. This is especially the case in the lungs and gastrointestinal tract, where the rates of respiration and digestion are moderated by hormones. Many of these cancers are asymptomatic and metastatic, which means they can develop unnoticed and spread from their original location to other tissues and organs. Clinical decision-making can be a challenge when determining the most appropriate treatment for patients with these cancers.

In this study, investigators were looking at a molecular imaging method that combines positron emission tomography (PET), which provides information about physiological processes in the body, and computed tomography (CT), ideal for imaging structure. PET/CT was performed in conjunction with injection of an imaging probe that works by combining the radionuclide Gallium-68 (Ga-68) with a molecular compound that mimics hormones called somatostatins that regulate the neuroendocrine system. Upon injection, the probe begins interacting with neuroendocrine cells—especially those within cancerous tumors, because they are more active than healthy cells. These biological processes show up as "hot-spots" on PET scans, letting clinicians know where neuroendocrine cancer is proliferating.

Results of the study indicated that PET/CT and Ga-68 DOTATATE was highly sensitive and specific for assessing neuroendocrine tumors and changed the course of treatment for a large number of patients. Prior to imaging, more than half of the 61 patients who were picked for the study were considered eligible for surgery to remove their cancer. The remaining 29 were determined to be inoperable. Subjects were then imaged using Gallium-68 DOTATATE PET/CT. After molecular imaging, about 36 percent of patients had a change in their management. Of those who were originally classified as operable, 14 were subsequently considered ineligible for surgery. For patients who were at first considered inoperable, 8 patients went on to have surgical resection of their tumors.

"This is the first prospective trial investigating the role of Gallium-68 DOTATATE in a multidisciplinary clinical setting and its impact on further patient management," says Schaefer. "Molecular imaging with this biomarker is already available in several centers around the world, and expansion of its use has the potential to help these patients and their treating physicians, who can use it to set up a clinical plan in one single investigation."

Provided by Society of Nuclear Medicine