PET technique promises better detection and response assessment for Non-Hodgkin's lymphoma

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Positron emission tomography (PET) and a molecular imaging agent that captures the proliferation of cancer cells could prove to be a valuable method for imaging a form of Non-Hodgkin's disease called mantle cell lymphoma, a relatively rare and devastating blood cancer. The pilot study is published in the December issue of the *Journal of Nuclear Medicine*.

Lymphoma is the term used for an array of cancers that affect blood cells and the lymphatic system. These cancers are typically categorized as either Hodgkin's or non-Hodgkin's. Mantle cell lymphoma (MCL) is a type of non-Hodgkin's lymphoma that accounts for approximately 6 percent, or roughly 3,000, of lymphoma cases in America, with prevalence in male populations over 60 years of age. MCL is caused by abnormal gene expression of B-cell lymphocytes within the mantle zone of lymph nodes. Normally these cells produce antibodies involved in the body's natural immune response, but in MCL these cells divide uncontrollably and don't terminate as healthy B-cells do.

The imaging agent being evaluated is called 3′-deoxy-3′-[F-18] fluorothymidine, or 18-F FLT. The combination of radionuclide and an analog of thymidine, a naturally occurring chemical compound that helps synchronize cell cycles, could provide a powerful biomarker for MCL.

"The encouraging results of this study should usher in new trials to

investigate the role of FLT-PET for therapy response assessment and post-treatment monitoring," said one of the principal scientists, Ulrich Keller. "With further research, FLT-PET could be implemented to provide highly sensitive imaging for patients with MCL."

Researchers evaluated participants of the study using a variety of conventional imaging methods. One week before scheduled treatment with immunochemotherapy patients underwent both FLT-PET and FDG PET/CT, another molecular imaging method that targets the high glucose metabolism of cancer cells. Five of these subjects had FLT-PET imaging performed again an average of about six days after the start of treatment to assess therapy response. Results showed all cancerous lesions found with more conventional imaging methods were very highly visible using FLT-PET. Correlation between areas of intense cancer proliferation and "high spots" of F-18 FLT on PET scans was performed using immunostaining, a technique that involves staining sections of tissues with antibodies in order to detect a particular biochemical process.

"MCL is still considered a non-curable disease, despite major advances in the clinical management of disease, underlining the need for reliable response assessment and post-treatment monitoring," added Keller. "The most widely used PET imaging agents have not yet proven to be beneficial for either one of them, which indicates FLT-PET's potential for MCL imaging."

Further research is expected to be conducted to confirm the efficacy of FLT-PET for initial detection and early response assessment of MCL.

More information: "A pilot study to evaluate FLT-PET for initial and very early response imaging in MCL", *Journal of Nuclear Medicine*.

Provided by Society of Nuclear Medicine