

3rd International Conference on

Radiology and Imaging

August 24-26, 2015 Toronto, Canada

Measurement of regional metabolic liver function by non-invasive dynamic 18F-FDGal PET/CT

Jacob Horsager, Susanne Keiding and Michael Sørensen
Aarhus University Hospital, Denmark

Measurement of hepatic metabolic function by the Galactose Elimination Capacity (GEC) is a clinically valuable prognostic liver test for patients with acute as well as chronic liver disease. The GEC test is based on nearly exclusive hepatic metabolism of galactose by the galacto-kinase enzyme and gives a measure of the total hepatic metabolic function but no information on regional variations. Based on the principles of GEC, we developed a PET/CT method with the radio-labeled galactose analog 18F-FDGal for 3D-quantification of regional hepatic metabolic function in vivo. The 18F-FDGal PET/CT method comprises a 20-min dynamic PET recording of the liver with intravenous administration of 100MBq 18F-FDGal. 3D images of the metabolic capacity, in terms of hepatic systemic clearance of 18F-FDGal, are created using a model of irreversible metabolism of the tracer in liver tissue (measured by PET) and arterial blood 18F-FDGal concentration as input. Recently, we refined the method by developing a method for replacing arterial blood sampling by an image-derived input function extracted from the abdominal aorta. Using the method, we demonstrated low metabolic capacity as well as increased metabolic heterogeneity in cirrhosis. These findings demonstrate the importance of estimating regional variation in liver function in order to spare well-functioning liver tissue, e.g. in patients with liver tumors undergoing stereotactic radiotherapy or partial liver resection. The method is easy to implement, as 18F-FDGal is produced using commercially available equipment used for routine production of the common glucose tracer 18F-FDG.

Biography

Jacob Horsager is a 5th year medical student. He has finished a research year project and has recently published 'Metabolic liver function measured in vivo by dynamic 18F-FDGal PET/CT without arterial blood sampling' in *EJNMMI Research*.

jacob.horsager.nielsen@post.au.dk

Notes: