

## Lecture Abstract or Synopsis for publication

### Analysis of <sup>18</sup>F-Fluorodeoxyglucose and <sup>18</sup>F-Fluoride Positron Emission Tomography on Stroke Patients with Carotid Atherosclerosis

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#### Abstract

**Background and Purpose:** The objective of this study was to analyze uptake pattern and intensity of <sup>18</sup>F-fluorodeoxyglucose (FDG) and <sup>18</sup>F-sodium fluoride (NaF) radioligands in carotid atheroma among stroke patients according to carotid atheroma characteristics.

**Methods:** Between September 2015 and January 2017, consecutive acute stroke or transient ischemic attack patients with 50% or more proximal internal carotid artery stenosis on brain CT angiography were prospectively enrolled. All patients received FDG and NaF positron emission tomography (PET) evaluation when their neurological status was stabilized. Uptake values of FDG and NaF were compared by target to blood ratio (TBR) according to the calcification burden, atheroma volume and the presence of necrotic core of carotid atheroma.

**Results:** A total of 18 patients with 36 carotid arteries were finally enrolled, with ten patients diagnosed as acute cerebral infarction due to symptomatic carotid stenosis. FDG uptake at symptomatic carotid artery was significantly more increased than that at asymptomatic artery (TBR:  $1.17 \pm 0.23$  versus  $1.01 \pm 0.15$ , Mann-Whitney U test,  $p = 0.02$ ), but NaF uptake was not different (TBR:  $1.38 \pm 0.49$  versus  $1.51 \pm 0.40$ ,  $p = 0.40$ ). In terms of calcification degree, NaF uptake increased as calcification burden increased (none,  $1.28 \pm 0.36$ ; spotty,  $1.29 \pm 0.29$ ; linear,  $1.74 \pm 0.44$ ; analysis of variance,  $p = 0.02$ ).

**Conclusions:** Carotid evaluation by FDG seems to be superior to NaF PET in the detection of symptomatic carotid atherosclerosis among stroke patients. NaF PET uptake reflects the overall calcification burden.

**Keywords:** stroke, carotid artery, atherosclerosis, positron emission tomography, glucose



**ICoLA 2019**

**The 8<sup>th</sup> International Congress on Lipid & Atherosclerosis (ICoLA)**

**The 58<sup>th</sup> Conference of the Korean Society of Lipid & Atherosclerosis (KSoLA)**

**September 5(Thu.) ~ 7(Sat.), 2019, Conrad Hotel Seoul, Republic of Korea**

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