DOES AUTOMATED ANALYSIS OF \([^{18}\text{F}]\text{FDG-PET/CT}\) HELP DIFFERENTIATING FRONTO-TEMPORAL DEMENTIA FROM ALZHEIMER’S DISEASE?

L. Ravasi\(^1\), P. Lenfant\(^1\), R. Lebouc\(^2\), A. Pallardy\(^1\), S. Henry\(^1\), M. Genty\(^3\), F. Lebert\(^2\), F. Semah\(^1\), F. Pasquier\(^2\), F. Le Jeune\(^4\)

\(^1\)Service de Médecine Nucléaire et Imagerie Fonctionnelle, Hôpital Salengro, CHRU Lille, EA1046, Université de Lille Nord, \(^2\)Centre Mémoire de Ressources et de Recherche de Lille, Hôpital Roger Salengro, EA 1046, \(^3\)Service d’Information et d’Archives Médicales, CHRU Lille, Lille, \(^4\)Service de Médecine Nucléaire, Centre Eugène Marquis, Rennes, France

Introduction: In younger patients, the \textit{invivo} clinical diagnosis of Alzheimer’s disease (AD) and of the fronto-temporal dementia (FTD) may be difficult. The gold standard diagnostic proof is currently still based upon pathology examination. It is crucial to find reliable techniques to make an accurate early in vivo diagnosis and to differentiate the etiology of the dementia.

Methods: Twenty-four patients (mean age 61 yrs) bearing clinically diagnosed AD (n=16) and FTD (n=8) underwent \([^{18}\text{F}]\text{FDG-PET/CT}\) brain scan.

Five nuclear medicine physicians with varying expertise in neuroimaging read each scan according to

i) visual analysis;

ii) automated analysis computed by BRASS® Hermes software;

iii) automated analysis computed by Cortex ID® General Electric software.

Interpretation aimed at assessing global scan, metabolism per hemisphere (in 5 relevant regions) and diagnostic degree of confidence.

Diagnostic interpretations coming from visual and automated analyses were compared to clinical diagnosis. Inter-observer agreement and Kappa scores were calculated.

Results: Among 360 analyzed scans, none was considered normal.

From visual analysis, 27% scans (of which 28/40 FTD) were slightly abnormal and the rest was highly abnormal.

From Cortex ID, 21.8% scans (25/40 FTD) were slightly abnormal.

From BRASS, 18.75% scans (22/40 FTD) were slightly abnormal.

Kappa analyses show a gain in diagnostic accuracy for a non-expert physician, a gain in diagnostic confidence with Cortex ID® and a gain in inter-observer diagnostic agreement with BRASS®.

Conclusion: Using automated software such as Cortex ID® or BRASS® helps standardizing the interpretation of \([^{18}\text{F}]\) FDG distribution pattern in AD or FTD.