

Abstract: PB3055

Title: COMPARISON OF [18F]FDG OR [18F]FET PET WITH MRI FOR RESPONSE EVALUATION IN PRIMARY CNS LYMPHOMA PATIENTS TREATED WITH HIGH-DOSE METHOTREXATE-BASED REGIMEN

Abstract Type: Publication Only

Topic: Aggressive Non-Hodgkin lymphoma - Clinical

Background:

The current standard method for evaluating response in patients with primary central nervous system lymphoma (PCNSL) is brain MRI. However, this method has limitations in distinguishing patients with radiologically unconfirmed complete response (CRu) from those with partial response (PR) or CR. Although [18F]FDG is the most widely used PET tracer for assessing metabolic response in systemic lymphoma, it has a limitation of high physiological uptake in normal brain tissue, which makes it difficult to accurately assess response in PCNSL. On the other hand, [18F]FET PET, an amino acids PET tracer, shows low physiologic uptake and provides a high tumor to brain ratio (as shown in Figure 1a).

Aims:

This study aimed to evaluate the end-of-treatment response by [18F]FDG and [18F]FET brain PET/CT and MRI in patients with PCNSL after first-line treatment.

Methods:

From August 2021 to October 2022, 28 newly diagnosed PCNSL patients at Asan Medical Center in South Korea were prospectively registered. All patients underwent high-dose methotrexate-based chemotherapy as their first-line treatment and received [18F]FDG and [18F]FET brain PET/CT alongside MRI for response evaluation.

Results:

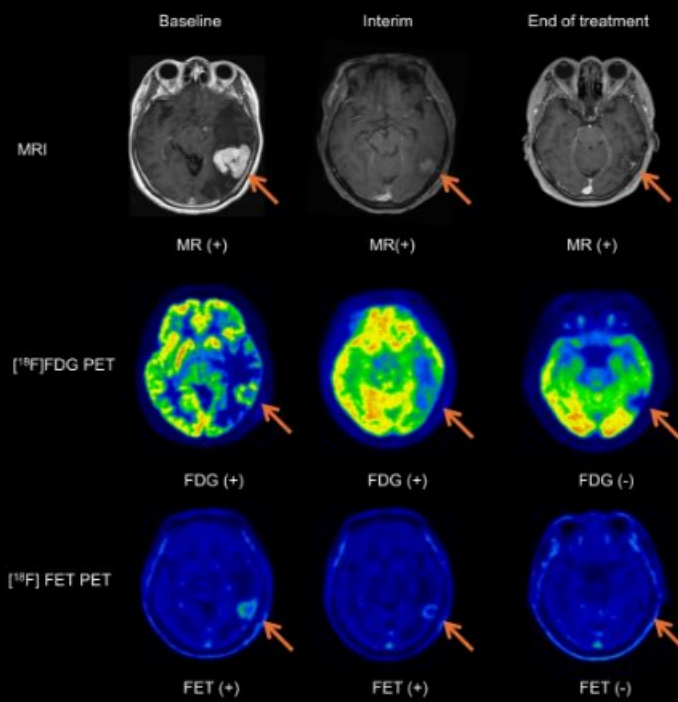
The median age of the patients was 66.5 years with 13 male participants. During the treatment, five patients showed progressive disease, and therefore, the response assessment was performed for 23 patients. Out of them, 14 achieved CR, six achieved CRu, and three achieved PR by MRI. However, 23 and 21 patients showed a complete metabolic response (CMR) by [18F]FDG-PET (FDG_CR) and [18F]FET PET (FET_CR), respectively (Figure 1b). During follow-up, five out of 23 patients showed progressive disease. With a median follow-up duration of 22.6 months, the 1-year PFS-rate and 1-year OS rate were 75.1% and 78.6%, respectively. Out of the nine patients with CRu or PR by MRI, only two showed progressive disease. There was no significant difference in PFS or OS between patients who achieved CR (n = 14) and CRu/PR (n = 9) by MRI. The 1-year PFS rate was 78.6% vs. 71.1% (p = 0.90), and the 1-year OS rate was 78.6% vs. 83.3% (p = 0.50). On the other hand, the 1-year PFS rate for CMR by FDG or FET PET was 78.2% and 80.1%, respectively.

Summary/Conclusion:

These findings suggest a potential utility of [18F]FDG and [18F]FET PET in evaluating responses for patients with PCNSL.

Figure 1. (a) Representative MRI, [18F]FDG and [18F]FET PET images at baseline, interim and end of treatment. (b) Comparison of MRI, [18F]FDG and [18F]FET PET response at end of treatment.

(a)



(b)

MRI	n	$[^{18}\text{F}]$ FDG PET		$[^{18}\text{F}]$ FET PET	
		CR	nonCR	CR	nonCR
CR	14	14	0	14	0
Cru	6	6	0	5	1
PR	3	3	0	2	1

Keywords: Positron emission tomography (PET), High dose methotrexate, CNS lymphoma