18F-FDG-PET/CT SCAN FOR DETECTION OF LARGE VESSEL INVOLVEMENT IN GIANT CELL ARTERITIS: ARTESER SPANISH REGISTRY

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Background and objectives

Imaging studies have transformed the diagnosis of large vessel vasculitis (LVV) involvement in giant cell arteritis (GCA). Positron emission tomography/computed tomography (PET/CT) scan with 18-fluorodeoxyglucose (18F-FDG) has emerged as a valuable tool for assessing LVV. Objectives: We aimed to determine the utility of 18F-FDG-PET/CT scan in detecting LVV in GCA.

Patients and method

The ARTESER study, is a large multicenter, retrospective, longitudinal, and observational study, promoted by the Spanish Society of Rheumatology. It included patients newly diagnosed with GCA across 26 tertiary hospitals from June 1st, 2013 to March 29th, 2019 . Patients were entered if diagnosed with incidental GCA who met specific criteria, including the ACR 1990 criteria, positive imaging results, or the expert clinical opinion of investigators . Differences between patients with positive and negative 18F-FDG-PET/CT scan results were analyzed using a bivariate model. A regression model assessed associations in patients with a positive scan, and ROC curve analysis evaluated the sensitivity and specificity of the 18F-FDG-PET/CT scan for newly diagnosed GCA .

Results

Out of 1675 GCA patients in the registry, 377 met the inclusion criteria of having an 18F-FDG-PET/CT scan. The majority were diagnosed with a cranial GCA phenotype, and 65% had LVV. The thoracic aorta was the most frequently affected vascular territory. Cardiovascular disease, diabetes, and older age had a negative association with a positive scan outcome . The OR for having a positive 18F-FDG-PET/CTC scan was lower as days went by. Depending on the cumulative dosage of glucocorticoids, 18F-FDG-PET/CT scan showed an AUC of 0.74.

Table 1. General characteristics of GCA patients in whom a 18F-FDG-PET/CT scan was performed.

	Total N=377	Negative 18F-FDG-PET/CT scan N=132	Positive 18F-FDG-PET/CT scan N=245	p-value*
Demographic data				
Women, n (%)	269 (71.4)	93 (70.5)	176 (71.8)	0.78
Age, years, mean (SD)	73.4 (9.0)	76.2 (8.1)	71.9 (9.0)	**0**
Laboratory parameters, mean (SD)				
ESR, mm/h	77.1 (34.9)	76.3 (30.9)	77.5 (36.9)	0.764
C-reactive protein, mg/L, median (Q1-Q3)	63 (22.4 - 130)	53.4 (20.3 - 126)	69 (25.2 - 134.7)	0.23
Hemoglobin, g/dL	11.6 (1.7)	11.8 (1.6)	11.4 (1.7)	**0.032**
Platelets, x 10⁹/L	330.2 (271.9)	306.4 (140.3)	343.6 (323.3)	0.22
Comorbidities*, n (%)				
Hypertension	229 (61.9)	92 (70.8)	137 (57.1)	**0.01**
Diabetes mellitus	71 (19.4)	33 (25.8)	38 (16.0)	**0.024**
Dyslipidemia	186 (50.5)	71 (54.6)	115 (48.3)	0.248
Cardiovascular disease	70 (20)	40 (31.5)	30 (13.5)	**<0.001**
Clinical phenotypes, n (%)				
Cranial	266 (70.6)	119 (44.7)	147 (55.3)	**<0.001**
Extracranial	93 (24.7)	7 (7.5)	86 (92.5)	
Delay from the clinical suspicion to the 18F-FDG-PET/CT scan, n (%)				
0-3 days	188 (53.3)	29 (26.9)	159 (64.9)	**<0.001**
4-10 days	41 (11.6)	16 (14.8)	25 (10.2)	
11-100 days	77 (21.8)	39 (36.1)	38 (15.5)	
More than 101 days	47 (13.3)	24 (22.2)	23 (9.4)	
Glucocorticoids received before the 18F-FDG-PET/CT scan, n (%)				
Glucocorticoids (oral or iv)	259 (68.7)	113 (85.6)	146 (59.6)	**<0.001**
No glucocorticoids	118 (31.3)	19 (14.4)	99 (40.4)	

Abbreviations: GCA: giant cell arteritis, ESR: erythrocyte sedimentation rate. *n for patients with hypertension was 370, diabetes mellitus 366, dyslipidemia 368, and cardiovascular disease 350. Data are obtained through bivariate analysis. *p-value refers to the statistical difference between patients with the listed characteristics and those without. In **bold**, p values <0.05.

Figure 1. Area under the curve in the ROC analysis.

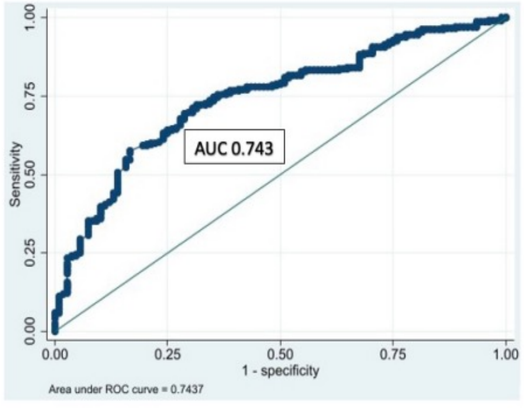

Table 2. Regression model for patients with GCA and a positive 18F-FDG-PET/TC.

Variables	OR [95% CI]
Age	**0.949** [0.914-0.986]**
Gender	0.610 [0.316-1.179]
Hypertension	1.065 [0.550-2.064]
Diabetes mellitus	**0.482* [0.238-0.978]**
Dyslipidemia	0.926 [0.512-1.1675]
Cardiovascular disease	**0.439* [0.211-0.914]**
Cranial GCA	1.206 [0.333-4.371]
Extracranial GCA	1.854 [0.455-7.554]
Oral glucocorticoids	0.984 [0.661-1.467]
Intravenous glucocorticoids	0.559 [0.222-1.409]
Days until the 18F-FDG-PET/TC was done (ref. group 0-3 days)	
4-10 days	**0.335* [0.143-0.783]**
11-100 days	**0.255** [0.125-0.523]**
More than 101 days	**0.189** [0.610-0.587]**

Abbreviations: GCA: giant cell arteritis. *p<0.05, **p<0.01. In **bold**, significant confidence intervals.

Conclusions

- Younger patients showed a higher probability of presenting LVV as detected by 18F-FDG-PET/CT scan.
- The timing of the examination and the cumulative dosage of glucocorticoids influenced the likelihood of a positive result, with earlier test being more likely to detect inflammatio