AB0501

THREE CASES OF VERTEBRAL ARTERITIS IDENTIFIED ON FDG-PET IN PATIENTS WITH SUSPECTED GCA AT UNIVERSITY COLLEGE LONDON HOSPITAL (UCLH)

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Background: Giant cell arteritis (GCA) may affect both cranial and extra-cranial vessels; where the latter occurs, it can be termed large-vessel GCA (LV-GCA). Large vessel involvement is common: histological evidence has been seen in 80% of autopsies of patients with known GCA, and imaging studies suggest large vessel involvement in over 80%. LV-GCA is important to diagnose due to the risks of vascular complications such as occlusion and ischaemic stroke. The clinical diagnosis can be challenging, and the American College of Rheumatology (ACR) GCA classification criteria often underperform in cases of LV-GCA¹. F-fluorodeoxyglucose positron emission tomography (FDG-PET) has been found to be useful in the detection of extra-cranial involvement to support the diagnosis of LV-GCA.²

Objectives: To appreciate the variability in presentation of cases of LV-GCA, and to further characterise a subgroup of patients with vertebral arteritis.

To explore the use of FDG-PET imaging in GCA patients in addition to or in place of traditional diagnostic tools (temporal artery ultrasound / biopsy).

Methods: Through evaluation of the new GCA fast-track pathway implemented at UCLH, a subgroup of patients diagnosed with vertebral arteritis was identified. The history and presentation of these patients were analysed.

Results: Three patients were diagnosed with vertebral arteritis. All three were male, Caucasian and aged over 70. All were investigated for GCA due to a history of severe headache (frontal in one, occipital in one, bi-temporal in one) with associated red flag symptoms. Two had a history of jaw claudication and visual disturbances (unilateral visual loss in one, transient diplopia in the other). Both of these patients had positive temporal artery biopsies. The third patient had no ischaemic symptoms but a strong history of prominent polymyalgic features and a positive temporal artery ultrasound. Inflammatory markers were raised in two, and normal in one, of the patients. Only one had systemic symptoms (weight loss). All three proceeded to FDG-PET scans which showed vertebral arteritis and were commenced on immunosuppressive treatment.

Conclusion: The cases discussed illustrate the heterogeneity of the presentation of LV-GCA, and the diagnostic challenge this poses. FDG-PET imaging is useful in confirming extra-cranial involvement and therefore guiding treatment.

References:

- [1] Large-vessel giant cell arteritis: diagnosis, monitoring and management. Matthew J Koster, Eric L Matteson, Kenneth J Warrington. 2018, Rheumatology, Vol. 57, pp. 32-42.
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AB0502

EVALUATION OF A NOVEL FAST TRACK PATHWAY FOR GIANT CELL ARTERITIS USING PET IN ADDITION TO TAUS AND TAB FOR EARLY DIAGNOSIS

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Background: Giant Cell Arteritis (GCA) is a common primary systemic vasculitis (1). Its predilection for the temporal artery can result in permanent visual loss if left untreated. Over 25% of patients have involvement of large vessels, such as the aorta, resulting in an increased risk of aneurysm formation and dissection. (3) Diagnosis of GCA is largely clinical and temporal artery biopsy (TAB) has long been the gold standard for diagnosis. In recent years temporal artery ultrasound (TAUS) has emerged as an effective, non-invasive tool to aid diagnosis. Positron-emission tomography (PET) can also be utilised to detect the presence of large vessel involvement but is currently not used in many centres for diagnostic purposes and requires further standardisation and validation (2). The challenge arises from these investigations losing sensitivity in the days following steroid treatment, meaning that rapid access is key to confirm diagnosis.

Objectives: To evaluate the impact of the introduction of a fast track pathway (FTP) on prompt diagnostics and treatment.

To improve our understanding of the use of PET at diagnosis and compare this to the gold standard TAB, and to TAUS, in our institution.

Methods: Cohort 1: 32 patients, all presenting before FTP implementation, identified from outpatient clinics and referrals to the Rheumatology team. Time taken from steroid initiation to TAUS/TAB was extracted from clinical records. Outcomes for this group included number of years on steroid (steroid burden).

Cohort 2: 21 patients all referred after implementation of a new GCA FTP. This group contains all patients referred as query GCA, not just those with positive diagnoses. Time from steroid initiation to TAUS/TAB was recorded. The FTP included the addition of PET imaging within 72 hours.

Results: Cohort 1: 20 (63%) patients had TAB and 3 (9%) had TAUS. The average time from starting steroid to investigation was 5.2 days and 2 days respectively. The average steroid burden in patients with no confirmatory test was 11 years. If patients had just a single diagnostic test this value dropped to 3 years. Cohort 2: 11 (52%) had TAB, 10 (48%) had TAUS and 11 (52%) had PET. In positive GCA diagnoses, time from steroid start to investigations was 7.2 days, 1 day and 3.2 days respectively. In patients with a negative diagnosis the time frames were 13 days, 1 day and 1.7 days respectively. Sensitivity for TAB was 45.5% and TAUS 40%. Specificity for TAB and TAUS was 100%. These results are comparable to similar studies (4). PET sensitivity was 63.6% and specificity 100%.

Table 1. Sensitivity, specificity, predictive values

	TAB	TAUS	PET CT
Sensitivity (%)	45.5	40.0	63.6
Specificity (%)	100	100	100
PPV (%)	100	100	100
NPV (%)	33.3	57.1	55.6

Conclusion: Prompt diagnostics, best facilitated through a FTP, can reduce steroid burden in GCA even if only one confirmatory test is available. Patients with a low clinical suspicion of GCA and negative TAUS or a high clinical suspicion and positive TAUS stand little to gain from TAB. These findings summarise the first 6 months of our GCA FTP. Continued evaluation of PET in our FTP is needed to understand its role in diagnosis, particularly in patients at risk of vascular complications.

References:

- [1] Crowson CS, Matteson EL. Contemporary prevalence estimates for giant cell arteritis and polymyalgia rheumatica 2015. *Semin Arthritis Rheum*. 2017; 47 (2) 253-6
- [2] Camellino D, DeJaco C. Should 18 F FDG PET imaging be used in the diagnosis of GCA? *Nature Reviews Rheumatology* 2019; 15 (7) 388-90
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- [4] Luqmani, R. et al. The Role of Ultrasound Compared to Biopsy of Temporal Arteries in the Diagnosis and Treatment of Giant Cell Arteritis (TABUL): A Diagnostic Accuracy and Cost-Effectiveness Study. *Health Technol Assess* 2016; 20 (90) 1-238

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AB0503

USE OF BIOLOGICAL THERAPY IN A COHORT OF PATIENTS WITH TAKAYASU ARTERITIS IN A THIRD LEVEL HOSPITAL.

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Background: Takayasu arteritis is a granulomatous vasculitis that affects large vessels, specially aorta and its main ramifications. It is a rare disease with an incidence between 0.3 and 1.2 per million inhabitants in Europe. It is more common in women (80%) and it usually occurs before age 40.

Objectives: Describe the characteristics and the use of biological therapy in a cohort of patients with Takayasu arteritis in our Hospital.

Methods: Retrospective descriptive study of patients diagnosed with Takayasu arteritis treated in the Rheumatology and Internal Medicine service in our hospital during 2019. Data have been obtained by reviewing medical records.

Results: 39 patients with takayasu arteritis were included, 33 women (84.4%) and 6 men, with an average age of 48 ± 12 years. About treatment, 35 patients received glucocorticoid treatment, of these, 23 patients (65.7%) received treatment with DMARDs. Methotrexate (47.8%) and Cyclophosphamide (43.5%) are the most used. 12.8% (5) of patients received treatment with biological therapy 2 patients received treatment with Rituximab (already retired) and 3 patients maintained the treatment with Tocilizumab. (The characteristics of the patients are in table 1). About the course of disease, 47.8% of patients have achieved clinical remission, 43.6% have a chronic course, and only 3 patients have presented relapse of disease.

Conclusion: The results of our study are consistent with what is published in the lit-

PATIENT	GENDER	AGE	DIAGNOSIS DATE	BIOLOGICAL THERAPY	START DATE	ADVERSE EFFECTS	RETIRED	TREATMENT TIME	PREVIOUS TREATMENT	COURSE OF DISEASE
1	female	48	2015	Tocilizumab	2018	No	No	13	Corticosteroids, Methotrexate	Chronic
2	female	54	2017	Tocilizumab	2019	Mild AE	No	9	Corticosteroids, Methotrexate	Chronic
3	female	69	2018	Tocilizumab	2018	No	No	18	Corticosteroids, Methotrexate	Chronic
4	female	47	2010	Rituximab	2011	No	Yes	36	Corticosteroids, Cyclophosphamide, Mycophenolate	Chronic
5	male	26	2006	Rituximab	2007	No	Si	48	Corticosteroids	Remission

erature. The average age of presentation is higher than in other series (48 ± 12 years), this is because all patients are European and Caucasian. There is still not much experience on biological treatment in patients diagnosed with sarcoidosis, however the

use of Rituximab, AntiTNFs and Tocilizumab has been described, presenting a good clinical response and with few adverse effects, as has been observed in our patients.

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AB0504

THE DIFFERENCES OF IMMUNE CHARACTERISTICS AND ITS RELATIONSHIP WITH DISEASE ACTIVITY IN LARGE VESSEL VASCULITIS PATIENTS

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Background: Large vessel vasculitis (LVV) is a rare refractory disease, giant cell arteritis (GCA) and Takayasu arteritis (TAK) constitute different types of primary LVV. Despite considerable discussion on the potential differences between GCA and TAK, the immunological difference and its relationship to disease activity remains unclear. **Objectives:** To investigate the differences of peripheral blood immuno-phenotype between TAK and GCA, and to analyze the correlation between immune metabolism level and disease activity in TAK.

Methods: All patients with TAK and GCA who come to our department from January 2010 to January 2020 were included, all of them met the classification criteria of American college of rheumatology. General information, clinical manifestations, laboratory index, artery involvement and therapeutic schedule were collected. According to the National Institutes of Health criteria, there were 29 active and 23 inactive TAK patients.

Results:

[1] Baseline characteristics, treatment, involvement artery in LVV patients are summarized in Table 1.

Table 1. Clinical characteristics of patients with LVV

Variable	TAK, n=52	GCA, n=4
Age, X±S	29±13	64±7
Female, n(%)	45(86.6)	1(25)
Constitutional symptoms, n(%)	23 (43.4)	3(75)
Cephalic symptoms, n(%)	33 (62.3)	2 (50)
Peripheral limb ischemia, n(%)	22 (41.5)	-
Ocular signs, n(%)	3 (5.7)	2 (50)
Stroke, n(%)	2 (3.8)	-
GC, n(%)	40(76.9)	3(75)
GC dose >7.5mg/day, n(%)	36 (90)	2 (66.7)
Surgical intervention, n(%)	7(13.2)	-
Coronary artery, n(%)	3(5.7)	-
Common carotid artery, n(%)	31(58.5)	-
Subclavian artery, n(%)	23(43.4)	-
thoracic aorta, n(%)	6(11.3)	-
abdominal aorta, n(%)	13(24.5)	-

GC Glucocorticoids, bDMARDs biologic DMARDs

(2) Compared with GCA patients, TAK patients were younger (29±13 vs 64±7, P=0.015), with higher peripheral blood lymphocyte count of CD8+T cells and lower CD4/CD8 (Table 2).

Table 2. Comparison of peripheral immune cells, humoral immunity among TAK and GCA, active and inactive TAK

Variable	TAK, n=52	GCA, n=4	p value	inactive TAK, n=23	active TAK, n=29	p value
Neutrophils	5.5±2.3	5.8±1.1	0.827	4.4±1.6	6.3±2.5	0.009 [*]
Lymphocytes	2.4±0.8	1.0±0.6	0.010 [*]	2.3±0.7	2.4±0.9	0.901
Monocytes	0.5±0.2	0.7±0.1	0.218	0.5±0.2	0.6±0.2	0.431
CD3 ⁺ T	1959±490	1154±541	0.189	2195±92	1842±585	0.467
CD4 ⁺ T	1074±305	758±303	0.381	1250±198	987±333	0.376
CD8 ⁺ T	859±212	297±87	0.048 [*]	945±41	815±258	0.542
CD4 ⁺ CD8 ⁺	42±27	12±7	0.344	63±2	32±28	0.229
CD4-CD8-	90±75	91±63	0.999	97±74	87±68	0.914
CD19 ⁺ B	273±97	191±94	0.470	202±106	309±84	0.242
CD16 ⁺ CD56 ⁺	135±72	104±67	0.709	112±63	146±83	0.639
CD4/CD8	1.25±0.15	2.55±0.51	0.001 [*]	1.33±0.26	1.21±0.10	0.440
IgG	11.7±3.7	8.3±0.5	0.124	10.3±3.4	12.9±3.6	0.025 [*]
IgA	2.6±1.3	2.3±0.8	0.724	2.1±1.3	3.0±1.1	0.021 [*]
IgM	1.7±0.9	0.8±0.2	0.118	1.5±0.8	1.8±0.9	0.202
K light chain	9.5±3.9	6.6±0.3	0.222	8.1±3.3	10.8±4.0	0.033 [*]
λ light chain	5.2±1.9	3.9±0.3	0.260	4.7±1.9	5.8±1.9	0.086

^{*}P<0.05

(3) The levels of neutrophils, monocytes, IgG, IgA and K light chain active TAK were higher than inactive TAK, with lower lymphocyte level (Table 2). Further correlation analysis showed that the levels of neutrophils, IgG, IgA and K light chain were positively correlated with disease activity (r=0.434, P=0.005; r=0.380, P=0.019; r=0.452, P=0.004; r=0.380, P=0.022).

Conclusion: Compared with GCA patients, TAK patients had higher level of CD8⁺T lymphocytes, consistent with previous studies. In addition, TAK patients had persistent immune cell involvement, while humoral immunity is related to disease activity. Deeper studies may be required about the role of immune profile in large vessel vasculitis.

References:

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AB0505

SEASONAL INFLUENCE IN PMR: NOT ONLY SUMMER, BUT WINTER IS COMING TOO

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Background: The cause for polymyalgia rheumatica (PMR) is currently unknown. Disease onset may be triggered by a combination of genetic predisposition and environmental factors such as infection.¹ In different regions of Denmark a simultaneous peak incidence of giant cell arthritis and PMR occurred together with epidemics of Mycoplasma pneumoniae, Chlamydia pneumoniae and Parvovirus B19.¹ A seasonal epidemics pattern for PMR would be supporting evidence for an infectious cause.¹ However, the current evidence of seasonal effect on the occurrence and disease severity of PMR is limited and show conflicting results.^{2,3}

Objectives: To evaluate whether there is a seasonal effect on the risk of developing PMR in the Netherlands

Methods: We retrospectively collected data on patient-, disease-, and treatment characteristics from newly diagnosed PMR patients (clinical diagnosis) who visited our outpatient clinic during April 2012 and September 2017. Exclusion criteria was other concomitant inflammatory rheumatic disease. Based on the onset of PMR (start symptoms, not time of diagnosis) patients were grouped per month. Descriptive statistics were used [mean (SD), median (p25-p75) or n (%) as appropriate]. The Chi square goodness of fit test was used to determine whether the incidence of onset of symptoms was different between months of the year.

Results: In total 448 patients were included and 55 % were female and mean age was 66 years. Other baseline characteristics are described in table 1. The chi-square goodness of fit test to determine whether there was a peak incidence in months was p=0.06. As shown in figure 1 the incidence of onset PMR symptoms is higher in December-January, April through June with a peak in August. The April-June peaks coincides with incidence peaks of Mycoplasma pneumoniae infections and possibly Parvovirus B19 in spring and summer, the December-January peak coincides with Parvovirus B19 infections.^{4,5}

Table 1. Baseline characteristics (n=448)

Characteristic	
Female (%)	247 (55)
Age, years (SD)	66 (8.6)
PMR symptoms before diagnosis, weeks (IQR)	10 (6-16)
Neck pain (%)	205 (46)
Bilateral shoulder pain	412 (91)
/stiffness (%)	
Bilateral hip pain/stiffness (%)	380 (85)
Morning stiffness>45 min (%)	233 (52)
Peripheral arthritis (%)	35 (8)
Systemic symptoms* (%)	199 (44)
Elevated ESR mm/hour and / or CRP mg/l	309 (87)
ESR mm/hour (IQR)	37 (26-51)
CRP mg/l (IQR)	30 (15-54)

*Fever, night sweats, weight loss, anorexia

** ESR n= 428; CRP n=396

Conclusion: No definitive seasonal effect was found on risk of developing PMR, although a bimodal seasonal pattern compatible with the proposed respiratory infections is suggested.

References:

- [1] González-Gay MA et al. Polymyalgia rheumatica. *Lancet.* 2017 Oct Oct 7.