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OBSERVATIONAL RESEARCH

Giant cell arteritis: insights from a monocentric retrospective cohort study

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Abstract

Giant cell arteritis (GCA), more common in Northern European populations, has limited data in Arabcountries. Our study reports GCA's clinical manifestations in Jordan and reviews published research on GCA across Arab nations. In this retrospective analysis, GCA patients diagnosed from January 2007 to March 2019 at a Jordanian academic medical center were included through referrals for temporal artery biopsy (TAB). A comprehensive search in PubMed, Scopus, and the DOAJ (Directory of Open Access Journals) databases was conducted to identify all relevant English-language manuscripts from Arab countries on GCA without time limitations. Among 59 diagnosed GCA patients, 41 (69.5%) were clinically diagnosed with a negative TAB, and 19 (30.5%) had a positive result. Females comprised 74.6% (n = 44) with 1:3 male-female ratio. The mean age at diagnosis was 67.3 (± 9.5) years, with most presenting within two weeks (n = 40, 67.8%). Headache was reported by 54 patients (91.5%). Elevated ESR occurred in 51 patients (78%), with a mean of 81 ± 32.2 mm/hr. All received glucocorticoids for 13.1 ± 10 months. Azathioprine, Methotrexate, and Tocilizumab usage was 15.3% (n = 9), 8.5% (n = 5), and 3.4% (n = 2), respectively. Remission was observed in 57.6% (n=34), and 40.7% (n = 24) had a chronic clinical course on treatment. Males had higher biopsy-based diagnoses (p = .008), and biopsy-diagnosed patients were older (p = .043). The literature search yielded only 20 manuscripts originating in the Arab world. The predominant study types included case reports and retrospective analyses, with only one case series and onecase-control study.

Keywords Giant cell arteritis · Vasculitis · Jordan · Arab · Temporal artery biopsy

Introduction

Giant cell arteritis (GCA) is a chronic inflammatory vasculitis involving the aorta and its major branches [1, 2]. GCA is believed to be most prevalent among older Europeans, particularly Northern Europeans (Scandinavians) [3, 4]. The diagnosis of GCA is based on the clinical presentation of a newly occurring temporal headache accompanied by symptoms like jaw claudication, visual disturbances, systemic features, evidence of large vessel involvement in vascular imaging, and/or histopathological findings indicating inflammation in the temporal artery [4]. Once diagnosed, typical treatment recommendations include oral/intravenous glucocorticoids and other medications such as methotrexate and tocilizumab [5, 6]. From an epidemiological standpoint, GCA has been the most extensively studied of all systemic vasculitides, but most data are derived from European studies [3, 7, 8]. Despite the well-documented geographic variation, which has the potential to influence disease classification and patient care, the EULAR and ACR guidelines rely heavily on this body of data as a foundation for their GCA management recommendations [5, 6, 9, 10]. Limited studies about GCA have been done in different countries in the Arab region, like Saudi Arabia, Tunisia, and Egypt [11–15]. This study aims to study the epidemiological, histopathological, and clinical features of GCA patients in Jordan for the first time and to comprehensively review all published research on GCA from the Arab world.

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Methods

Study design and population

This retrospective study was conducted at the University of Jordan Hospital, the primary teaching hospital affiliated with the University of Jordan School of Medicine. Cases of GCA were recognized through the retrieval of all temporal artery biopsies (TAB) conducted between January 2007 and March 2019 from the pathology laboratory database. Our team had previously published details on TAB utilization for the diagnosis of GCA in a prior study [16]. Subsequently, patients' files were meticulously reviewed to extract relevant data for this investigation, as outlined in the data collection section below. The study encompassed patients diagnosed with GCA The study encompassed patients diagnosed with GCA according to the American College of Rheumatology 1990 criteria for the classification of GCA, even in cases where biopsies yielded negative results.

Data collection

Information on demographics and clinical aspects, covering gender, age at the time of TAB, presenting symptoms, comorbidities, and medication details, were extracted from medical records. Additionally, the study documented laboratory findings, encompassing C-reactive protein (CRP) and erythrocyte sedimentation rate (ESR) levels, white blood cell count, hemoglobin, and serum albumin.

Ethical approval

The research protocol obtained approval from the Ethics Committee of the University of Jordan Hospital (IRB approval number: 67/2018/3476), and the study adhered to the principles outlined in the Helsinki Declaration.

Statistical analysis

Statistical analysis was performed using the IBM SPSS version 22.0 for Windows (IBM Corp., Armonk, NY, USA) software package. Descriptive statistics were used to present sample characteristics, including counts, percentages, means, and standard deviations. The association between outcomes and categorical independent variables was examined through the Chi-square test. At the same time, the t-test was employed to assess the relationship between outcomes and continuous independent variables. Following the validation of all statistical hypotheses, a binary logistic regression test was used to determine the outcome's determinants. A p-value of 0.05 or less was considered statistically significant.

Results

Sample characteristics

Fifty-nine patients diagnosed with GCA were cared for at the Jordan University Hospital (2008–2019). Forty-four patients were females (74.6%), while 15 patients were males (25.4%), yielding a male-female ratio of 1:3. The age at diagnosis ranged between 48 and 85 years, with a mean of 67.3 ($\pm$9.5) years. Morbidities before the GCA diagnosis included 45 with hypertension (76.3%), 38 with diabetes (64.4%), 24 with ischemic heart disease (40.7%), and four with hypothyroidism (6.8%).

Patients were initially evaluated by rheumatologists in 24 (40.7% of cases), neurologists in 20 (33.9%), and ophthalmologists in 11 (18.6%), while other specialties first assessed the remaining four (6.8% of cases). Forty patients (67.8%) reported less than two weeks of symptoms at the time of the first presentation, seven patients (11.9%) reported six months of symptoms, and six (10.2%) reported symptoms for longer than a month.

The most frequently reported symptom was headache, which was reported by 54 patients (91.5%), followed by blurred vision in 23 (39%), PMR symptoms in 19 (32.2%), jaw claudication in 18 (30.5%), vision loss in 7 (11.9%), and temporal artery pulselessness and tenderness reported by seven patients (6.8%) (Table 1).

In 23 patients (39%), the ophthalmologic examination yielded normal findings, while in five patients (8.5%), it showed anterior ischemic optic neuropathy, and an additional five patients (8.5%) exhibited optic disc swelling. The status of the eye examination was unknown in the remaining 16 patients (27%) (Table 2). Among those with anterior ischemic optic neuropathy ($n=5$), one (20%) reported vision loss, one (20%) reported blurred vision, one (20%) reported decreased visual activity, and two (40%) had no visual symptoms. Similarly, among those with optic disc swelling ($n=5$), one (20%) reported vision loss, three (60%) reported blurred vision, and the remaining one patient (20%) had no visual symptoms.

Laboratory results

Regarding laboratory investigations (Table 2), 51 (78%) patients had elevated Erythrocyte Sedimentation Rates (ESR) ranging between 35 and 125 mm/hour (mean = 81 $\pm$ 32.2 mm/hour), 29 patients (49.2%) had elevated levels of C-reactive protein (CRP), 23 patients (39%) had leukocytosis, 20 patients (33.9%) had anemia, five patients (8.5%) had elevated serum alkaline phosphatase, and four patients (6.8%) had low serum albumin.

Table 1 Sample characteristics of the study patients ($N=59$)

Characteristic		Frequency (%)	Mean (±SD)
Gender	Male	15 (25.4)	
	Female	44 (74.6)	
Age at Diagnosis (years)			67.3 (±9.5)
Smoker	Yes	52 (88.1)	
	No	7 (11.9)	
Prior Morbidities	Hypertension	45 (76.3)	
	Diabetes	38 (64.4)	
	Ischemic Heart Disease	24 (40.7)	
	Hypothyroidism	4 (6.8)	
Initial Diagnosing Specialty	Rheumatologist	24 (40.7)	
	Neurologist	20 (33.9)	
	Ophthalmologist	11 (18.6)	
	Other	4 (6.8)	
Reported Length of Symptoms	Less than 2 weeks	40 (67.8)	
	Between 2–4 weeks	7 (11.9)	
	More than 4 weeks	6 (10.2)	
Reported Symptoms	Headache	54 (91.5)	
	Blurred Vision	23 (39)	
	PMR Symptoms	19 (32.2)	
	Jaw Claudication	18 (30.5)	
	Vision Loss	7 (11.9)	
	Temporal Artery Pulselessness	4 (6.8)	
	Temporal Artery Tenderness	4 (6.8)	

Table 2 Investigations performed for the GCA patients ($N=59$)

Laboratory Result		Frequency (%)	Mean (±SD)
ESR (mm/hour)			81 (±32.2)
Elevated CRP		29 (49.2)	
Leukocytosis		23 (39)	
Anemia		20 (33.9)	
Elevated Serum Alkaline Phosphatase		5 (8.5)	
Low Serum Albumin		4 (6.8)	
Ophthalmic Examination	Anterior Ischemic Optic Neuropathy	5 (8.5)	
	Optic Disc Swelling	5 (8.5)	
	Normal	23 (39)	
	Unknown	16 (27)	

Clinical management of the patients

Out of 59 patients, 45 (76.3%) were hospitalized at presentation, and all received glucocorticoids for a mean duration of 13.1 ± 10 months. Among them, 21 patients (35.6%) initially received glucocorticoids intravenously, followed by glucocorticoids Orally. Glucocorticoid-sparing immunosuppressant treatment included Azathioprine in nine (15.3%) of the patients and Methotrexate in five (8.5%), while Tocilizumab was utilized in only two patients (3.4%). Follow-up duration ranged from 1 to 123 months (mean = 23.6 ± 30.4 months). Remission was observed in 34 (57.6%) patients, while 24 (40.7%) patients had a chronic clinical course on treatment, and one (1.7%) patient experienced vision loss complications. Echo findings showed diastolic dysfunction in 27 (45.8%) patients, systolic dysfunction in two (3.4%), and none had an aortic aneurysm.

Biopsy proved GCA versus clinically based GCA

Out of the 59 patients, 41 (69.5%) received a clinical diagnosis of GCA despite a negative TAB, whereas only 18 (30.5%) were diagnosed with a positive TAB result. Two patients had delayed bleeding at the biopsy site, but the patients reported no other significant side effects. Comparisons between the two groups indicated that males have a significantly higher likelihood of being diagnosed through biopsy results than females ($p=.008$), and patients diagnosed based on biopsy results are significantly older ($p=.043$). However, the two groups did not differ in the length of symptoms before diagnosis, types of symptoms, laboratory results, or clinical outcome (Table 3).

Discussion

This study aimed to characterize Giant Cell Arteritis (GCA) within the Jordanian population. Over a span of 12 years, 59 patients were diagnosed with GCA through referrals for temporal artery biopsy (TAB). The likelihood of a significantly higher number of GCA cases is low, as our institution consistently refers all suspected cases to TAB, except

Table 3 Independent factor comparison between biopsy-proven GCA and clinically based GCA ($N = 59$)

Factor		Clinically based GCA ($n = 41$) Frequency (%) or Mean (± SD)	Biopsy-proven GCA ($n = 18$) Frequency (%) or Mean (± SD)	p
Gender	Male	6 (14.6)	9 (50)	0.008*
	Female	35 (85.4)	9 (50)	
Age at Diagnosis (years)		65.7 (± 9.5)	71.1 (± 8.6)	0.043*
Initial Diagnosing Specialty	Rheumatologist	18 (43.9)	6 (33.3)	0.608
	Neurologist	14 (34.1)	6 (33.3)	
	Ophthalmologist	7 (17.1)	4 (22.2)	
	Other	2 (4.8)	2 (11.1)	
Length of Symptoms (weeks)	Less than 2	30 (73.2)	10 (55.6)	0.230
	Between 2–4	5 (12.2)	2 (11.1)	
	More than 4	2 (4.8)	4 (22.2)	
Reported Symptoms	Headache	38 (92.7)	16 (88.9)	0.823
	Blurred Vision	16 (39)	7 (38.9)	0.542
	PMR Symptoms	13 (31.7)	6 (33.3)	0.510
	Jaw Claudication	13 (31.7)	5 (27.8)	0.264
	Vision Loss	6 (14.6)	1 (5.6)	0.542
	Temporal Artery Pulselessness	2 (4.8)	2 (11.1)	0.490
	Temporal Artery Tenderness	2 (4.8)	2 (11.1)	0.490
Laboratory Results	ESR (mm/hour)	84.2 (± 34.9)	77.2 (± 32.4)	0.741
	Elevated CRP	23 (56.1)	6 (33.3)	0.242
	Leukocytosis	14 (34.1)	9 (50)	0.499
	Anemia	14 (34.1)	6 (33.3)	0.853
	Elevated Serum Alkaline Phosphatase	3 (7.3)	2 (11.1)	0.216
	Low Serum Albumin	1 (2.4)	3 (16.7)	0.104
Final Outcome	Remission	25 (61)	9 (50)	0.534
	Chronic Course or Complicated with Vision Loss	16 (39)	9 (50)	

[a] Pearson's Chi-square [b] Independent-sample t-test * Statistically significant; $p < .05$

in occasional instances where patients decline biopsy and choose clinical management.

Most patients in this study were females with a male-female ratio of 1:3, keeping with the general observation of female predominance in this disease [33–35]. Gender-based variations exist in immune responses, and women were shown to demonstrate greater susceptibility to drug effects than men [36]. The average age of patients at the time of diagnosis was 67 years, aligning with the literature, which indicates that GCA is less prevalent in individuals under 50 [5, 37]. Age-related remodeling of the immune system, both innate and adaptive, and age-related damage to the arterial wall may increase the risk of developing GCA [38]. However, the specific triggers and mechanisms of chronic damage in GCA remain unidentified [39]. The current pathogenic model is based on histopathological and immunopathological investigations showing arterial wall inflammation involving CD4 + T lymphocytes and macrophages, often organizing into granulomatous structures with the formation of giant cells [40]. There is a remarkable loss of vascular smooth muscle cells (VSMC) and elastic fibers, which may potentially promote the development of aneurysms. Intimal hyperplasia and lumen blockage are caused by inflammation-induced vascular remodeling, which is the source of ischemic complications of the disease [40, 41].

Our institution utilizes a fast-track system of referring patients to specialists, with most patients having reported less than two weeks of symptoms at the time of the first presentation. It has been demonstrated that accelerated diagnostic and treatment procedures for GCA via Fast-track pathways, such as immediate referral to a specialist and the beginning of glucocorticoid therapy, can reduce the risk of GCA's feared complications, such as vision loss [42]. New-onset headache is frequently encountered as a common presenting symptom of GCA and stands out among the most prevalent symptoms associated with GCA. In our patient cohort, headache was the most frequently reported symptom (91.5% of patients), followed by blurred vision, PMR, and jaw claudication—notably, none of the patients presented with limb claudication, peripheral ischemia, or stroke. In a study involving 240 Spanish patients with biopsy-confirmed GCA, 86.4% presented with headache, and in 33% of cases, it was the initial symptom [43].

Table 4 Published literature on GCA in the Arab population

Number	Author	Country	Year	Study design	Characteristics of patients	Therapy	Findings
1	Bosley, Thomas M., et al. [17]	Saudi Arabia	1998	Retrospective	72 TAB performed at the King Khaled Eye Specialist Hospital between 1982–1998	Not reported	Only four TAB were positive for GCA.
2	Chaudhry, Imtiaz A., et al. [11]	Saudia Arabia	2007	Retrospective	102 patients (56 men, 46 women) were referred for TAB at a specialized eye hospital between 1983–2004	60 (58.8%) patients were systemically treated either with intravenous (17; 28%) or oral (43; 72%) glucocorticoids before or after obtaining the results of TAB.	81% had vision loss in one eye, 14.8% in both eyes, 38% had headaches, 17.6% had temporal area tenderness, and 8.8% had jaw claudication. Seven patients (6.8%) only had biopsy-proven GCA.
3	Khalifa M, et al. [12][l]	Tunisia	2009	Retrospective	96 patients were diagnosed with GCA between 1986 and 2003. All patients fulfilled the ACR criteria for the classification of GCA.	All patients were treated with glucocorticoids.	Headache was the predominant symptom (91.7%), in addition to temporal artery abnormalities in 85.4%, severe ischemic manifestations in 80.2%, constitutional symptoms in 75%, and polymyalgia rheumatica in 56.3%. TAB confirmed the diagnosis in 73% of cases.
4	Habib, Hisham M., et al. [18]	Saudi Arabia	2011	Case-control	32 patients with clinically suspected GCA and 30 age- and gender-matched control subjects were used to assess the diagnostic efficacy of color duplex ultrasonography (CDU) compared to TAB and clinical findings.	All patients had received glucocorticoids therapy in the form of prednisone in doses ranging from 40 to 60 mg daily for varied durations of 1–3 months, followed by gradual tapering.	Baseline CDU: Halo sign observed in 81% of GCA patients, 12% of non-GCA patients, and none in controls. (sensitivity 81%, specificity 88%). Follow-up CDU: Halo sign disappeared in 9 patients at 2 weeks and 4 patients at 4 weeks (average disappearance time: 21 days post-treatment)
5	Gruener, Anna M., et al. [19]	Saudi Arabia	2017	Retrospective	Review of the final diagnoses of 171 patients who had anterior ischemic optic neuropathy (AION) between 1997 and 2012	Not reported	Only 4 patients had biopsy-proven GCA, concluding that GCA-related ischemia is much less frequent in Saudi Arabia than in North America.
6	Shahin, Amira A., et al. [14]	Egypt	2018	Retrospective	630 patients were diagnosed with a systemic vasculitis diagnosis (264 males and 366 females), between 2002–2016, with ages ranging from 9 months to 74 years.	Not specified	Similar to study no. 15 above, Egypt's most common vasculitis is associated with HCV infection (24%) and Bechet disease (23.5%)—only 3 GCA cases in this study.
7	Attia, Doaa Hassan Sayed, et al. [15]	Egypt	2019	Retrospective cohort	309 patients who were diagnosed with various vasculitis diagnoses between 2002 and 2018	Not specified	The most frequent vasculitides in Egypt were Behçet's disease and hepatitis C virus (HCV) vasculitis. Only 3 patients were diagnosed with GCA.
8	Mehta, Kunal, et al. [20]	Lebanon	2022	Retrospective	310 patients (73.9% females) underwent bilateral TAB to diagnose GCA between 2011 and 2020. Mean age, 70.8 years.	Most patients (85.2%) were on preoperative glucocorticoids therapy at the time of surgical biopsy, with a mean preoperative duration of glucocorticoids therapy of 15.1 days.	Presenting symptoms included headache (81%), vision changes (45.2%), and temporal tenderness (32.6%). Symptoms were bilateral in 59% of the patients. Most patients (85.2%) received preoperative glucocorticoids therapy for an average of 15.1 days. 91 patients (29.4%) had a positive pathologic diagnosis after bilateral TAB, and 11 patients had a positive pathology result in only one specimen.

Table 4 (continued)

Number	Author	Country	Year	Study design	Characteristics of patients	Therapy	Findings
9	Oumerzouk, J., et al. [21]	Morocco	2023	Retrospective	15 patients were diagnosed with GCA from 1991 to 2008 (male-to-female ratio 2:3) and a mean age of 63 years (range: 55–83 years).	All patients were placed on glucocorticoids.	All patients exhibited headaches, with 20% experiencing isolated headaches and 73% showing neuroophthalmic complications. TAB provided a conclusive diagnosis of GCA in 67% of cases.
10	Al Tahan, Abdulrahman, et al. [22]	Saudi Arabia	1997	Case series	Two cases, a 78-year-old male and a 74-year-old female	The first patient was started on 80 mg of prednisolone with rapid clinical improvement. The second patient was started on 60 mg of prednisolone, which resulted in fast relief of her headache within a few days.	Both patients manifested classic GCA presentation with headache and tenderness of the temporal arteries with high ESR, and TAB was consistent with GCA. The second patient developed a fatal stroke three months after diagnosis after she discontinued her glucocorticoids treatment.
11	Achar, K.N., et al. [23]	Kuwait	1994	Case report	A 55-year-old male was admitted with a 1-month history of headache, fatigue, pain, and proximal weakness in lower limbs. His labs showed liver cholestasis.	The patient was started on prednisolone 60 mg/day with a dramatic improvement. Normalization of cholestatic dysfunction was achieved after eight weeks of glucocorticoids therapy.	Bilateral TAB showed the typical features of GCA. A liver biopsy was performed because of the cholestatic dysfunction and showed normal hepatic architecture using light microscopy but showed damage to the bile ultrastructure on electron microscopy.
12	Al-Alawi, Ebtisam, et al. [24]	Bahrain	2003	Case report	A 60-year-old woman with no history of hypertension or diabetes presented with sudden vision loss in her right eye and a severe headache that started two weeks earlier.	Not available	She was diagnosed with anterior ischemic optic neuropathy due to GCA.
13	Haddad, Fady G., et al. [25]	Lebanon	2008	Case report	A 66-year-old male with acute type A aortic dissection after being diagnosed with GCA 2 years earlier that resulted in right eye blindness	Prednisone 60 mg daily and methotrexate 15 mg weekly;	Despite prior glucocorticoids and methotrexate treatment and a CT scan ruling out aortic pathology 9 months prior, the patient presented with aortic dissection extending from the ascending aorta to the iliac arteries, requiring surgical intervention. Aortic wall pathology indicated diffuse aortitis with giant multinucleated cells, and the patient was discharged on glucocorticoids therapy.
14	Haddad, Fadia, et al. [26]	Lebanon	2008	Case report	The same 66-year-old male patient in case number 13 above developed an Aorto-atrial fistula 10 days after dissection repair for acute type A aortic dissection with a background of GCA diagnosed 2 years earlier.	Same as above	The aortic root was left intact during the initial surgery but was completely removed 10 days later after an early postoperative aorto-atrial fistula.
15	Khader, Mustafa N., et al. [27]	Jordan	2015	Case report	A 65-year-old man presented with abrupt paraplegia, 4-day back pain, sensory loss below the umbilicus, and bilateral scalp necrosis.	IV methylprednisolone (1 g/day) for 4 days initially, followed by another course of IV methylprednisolone (1 g/day) for 3 days along with oral prednisone 60 mg/day.	MRI revealed dorsal spinal cord infarction, and TAB confirmed GCA

Table 4 (continued)

Number	Author	Country	Year	Study design	Characteristics of patients	Therapy	Findings
16	Wang, Sijie Jason, et al. [28]	Lebanon	2016	Case report	A 63-year-old female presented with burning tongue pain triggered by eating or drinking, alleviated by abstaining from food in addition to a recent intensification of severe headaches	Prednisone 60 mg per day.	A diagnosis of GCA was confirmed after a bilateral temporal artery ultrasound and a bilateral TAB.
17	Albarrak, Anas Mohammad, et al. [29]	Saudi Arabia	2018	Case report	An 80-year-old male with simultaneous bilateral vision loss five days before presentation.	IV Methylprednisolone 1000 mg for five days, then shifted to daily prednisolone 60 mg orally.	GCA diagnosis confirmed via left TAB. Brain MRI with MRA revealed a right optic nerve lesion and no flow in both ophthalmic arteries.
18	Idoudi, Safa, et al. [30]	Tunisia	2020	Case report	A 72-year-old male with a history of hypertension, dyslipidemia, right leg amputation, and headaches but no visual symptoms presented with a one-week history of a painful necrotic ulceration on the scalp.	Oral glucocorticoids 1 mg/kg/day. Despite this treatment, the lesion worsened, and the patient underwent surgical treatment for his scalp lesion.	GCA diagnosis was confirmed through clinical presentation and TAB. Surgical treatment followed, with an uneventful recovery.
19	AlNuaimi, Dana, et al. [31]	Emirates	2020	Case report	A 63-year-old male presented with sudden vision loss and an ischemic brain infarct. He is a non-smoker. His medical history included type II diabetes, hypertension, and hyperlipidemia.	Glucocorticoids and glucocorticoids -sparing immunosuppressive therapy	The patient had an atypical clinical presentation of temporal arteritis, and the diagnosis of GCA was confirmed on TAB with PET-CT, revealing the full disease burden of the involved vasculature.
20	Mursi, Ali M., et al. [32]	Egypt	2022	Case report	A 61-year-old female with type 2 diabetes mellitus, hypertension, dyslipidemia, and hypothyroidism presented with a left temporal continuous headache and vision loss.	IV methylprednisolone 1 gm daily for 3 days, followed by 60 mg prednisolone for 4 weeks, followed by gradual withdrawal. The headache continued, so a perineural injection therapy was started once daily for 6 sessions, at which the headache was completely resolved after the third injection. The vision was regained completely after the sixth injection.	The patient was diagnosed with GCA and polymyalgia rheumatica. The case was regarded as post-COVID-19 GCA, given the reported history of hospitalization due to COVID-19 infection.

Abbreviations: MRI: Magnetic Resonance Imaging, MRA: Magnetic Resonance Angiography, ACR: American College of Rheumatology, COVID: COronaVirus Disease, PET-CT: Positron Emission Tomography–Computed Tomography. IV: intravenous

Evidence of ocular complications was seen in a minority of the patients, as only five patients had anterior ischemic neuropathy, and the other five patients had optic disc swelling. In two studies done in Sweden, only 85 out of 840 GCA patients and 1618 out of 12,048 patients developed visual complications [44, 45]. Factors predicting ocular complications in these studies included male gender, hypertension, diabetes, absence of headache or abnormal temporal artery findings during clinical examination, use of β-adrenergic inhibitors, low C-reactive protein (CRP) levels at the time of diagnosis, and the lack of Polymyalgia Rheumatica (PMR) symptoms.

TAB is frequently recommended in all suspected cases of GCA as the gold standard for diagnosis [5], despite its limited sensitivity arising from the disease's segmental nature and the patient's presentation with a cranial or large-vessel phenotype [46]. Imaging and biopsy were shown to have comparable diagnostic values if the evaluators were competent with these techniques [6].

In our study, 70% of patients received clinical diagnoses of GCA despite negative TAB results. Notably, males were more frequently diagnosed based on biopsy results than females, and this subgroup exhibited a significantly older age. In a prospective, multicenter French study comprising 207 biopsy-proven and 85 negatively biopsied GCA patients, the biopsy-diagnosed group slightly included more females [47]. Furthermore, findings from a survey of 102 patients who underwent TAB Saudi Arabia indicated that patients diagnosed with biopsy results were significantly older, affirming the consistency with our study's results [11].

No significant differences were observed between those diagnosed based on biopsy and those diagnosed based on clinical grounds regarding symptom duration, symptom types, laboratory results, or outcome. In the French study referenced above comparing these groups, the time from symptom onset to diagnosis was similar. Jaw claudication and temporal artery abnormalities were more frequent in the biopsy-positive group, while headache and PMR symptoms were notably more prevalent in the clinically diagnosed group. Sudden blindness occurred more frequently in the biopsy-positive group, while troubled vision showed a comparable occurrence in both groups [47]. Even though elevated inflammatory markers were found in over three-quarters of the patients in our study, high ESR was not correlated with positive TAB. In a study of 764 GCA patients, the estimated sensitivity of ESR for a positive TAB was 84.1%, emphasizing the need for cautious use and careful interpretation of inflammatory markers, especially concerning the timing of disease sampling [48].

In our study, all patients received glucocorticoids for a duration between 1 and 76 months. Twenty-one received parenteral (IV) glucocorticoids upon presentation, followed by oral glucocorticoids. Similarly, in the study in Saudi Arabia, all patients were treated with either intravenous or oral glucocorticoids before or after obtaining the results of TAB, and treatment lasted from 3 days to 6 years [11].

Initiation of high-dose oral glucocorticoids rather than moderate-dose glucocorticoids is recommended for all patients with GCA [5]. The appropriate dosage and method of glucocorticoid administration for newly diagnosed GCA depend on the presence of potential GCA-related visual symptoms, such as vision loss, or cerebrovascular events like stroke or transient ischemic attack. In such cases, a larger initial dose of glucocorticoids is required and should be promptly administered [5, 49]. The optimal duration for GCA glucocorticoid therapy is not defined and should be personalized. Additionally, glucocorticoid-sparing immunosuppressants like Tocilizumab or methotrexate are advised [6].

Only 16 patients in our study population utilized glucocorticoid-sparing agents, with 9 using Azathioprine, 5 using Methotrexate, and 2 using Tocilizumab. This limited usage may be attributed to many patients being diagnosed before the now widely accepted recommendations for administering glucocorticoid-sparing agents. Several studies highlight the effectiveness of immunosuppressants in GCA treatment. In a small study of 31 patients with GCA, PMR, or both, Azathioprine significantly reduced the mean prednisolone dose at 52 weeks [50]. As per Methotrexate, its adjunctive use with glucocorticoids led to a lower risk of relapses and reduced glucocorticoids exposure among 161 patients evaluated in randomized trials [51]. A year-long trial with 251 patients showed that achieving remission without glucocorticoids in GCA patients was superior to Tocilizumab compared to the placebo, and the drug has been approved as a treatment for GCA [5, 52]. Additionally, another study suggested that Mycophenolate might be considered a glucocorticoids -sparing agent, particularly for patients unresponsive to conventional therapy or those for whom glucocorticoids dosage reduction is strongly recommended [53].

We conducted a comprehensive search across PubMed, Scopus, and the Directory of Open Access databases to locate English-language manuscripts from Arab countries on Giant Cell Arteritis (GCA), with no restrictions on the timeframe. The search utilized keywords, including "Giant," "Temporal arteritis," and "Arab," along with individual keywords for each Arab country (Algeria, Bahrain, Comoros, Djibouti, Egypt, Iraq, Jordan, Kuwait, Lebanon, Libya, Mauritania, Morocco, Oman, Palestine,

Qatar, Saudi Arabia, Somalia, Sudan, Syria, Tunisia, the United Arab Emirates, and Yemen) (Table 4). Our search revealed only 20 studies conducted in the Arab world; 6 were in Saudi Arabia, five were in Lebanon, three were in Egypt, two were in Tunisia, and one was in Jordan, Morocco, Bahrain, UAE, and Kuwait. Of these, most were case reports and retrospective studies with only one case series and one case-control. The ages of the patients ranged from 60 to 80 years. Most of the patients in the retrospective studies presented with the well-known symptoms of GCA: headache, hardened and tender temporal arteries, jaw claudication, diplopia, and vision loss. Details of these studies can be found in Table 4.

The study's results should be interpreted with awareness of certain limitations that might be addressed in future research. The study's retrospective nature and the method of patient inclusion relied on reviewing referrals to TAB to determine whether patients could be diagnosed with GCA, potentially influencing the actual number of patients.

In conclusion, the Giant Cell Arteritis GCA diagnosis is uncommon in Jordan and rare among Arabs. The presenting symptoms and outcomes observed in this population are consistent with existing literature; however, there is a notable gap in research and awareness concerning GCA in this region. Therefore, further investigations and increased awareness are warranted to enhance our understanding of GCA's prevalence, clinical manifestations, and management within the Jordanian and broader Arab populations.

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