Original Research Article

Pulmonary and neurological profile of vasculitis patients at tertiary care hospital

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Abstract

Background: The vasculitis are a heterogenous group of conditions characterized by blood vessel inflammation and necrosis. Vasculitis are relatively uncommon conditions whose etiology is still poorly understood. Treating vasculitis is as regarding as establishing diagnosis. In the absence of treatment, most of patients will suffer or die. With treatment most of patients improve, many will achieve remission and a few will be cured. Disease classification is the process of categorizing illnesses in a larger framework of medical conditions.

Objectives: To study the pulmonary and neurological profile of vasculitis patients at a tertiary care centre.

Materials and methods: The present hospital based observational study was conducted in the Department of Internal Medicine, SKIMS Srinagar. The study had two parts; retrospective and prospective. Retrospective part: All patients of vasculitis who were admitted or evaluated in OPD from March 2012 to Sept. 2018, were enrolled for the analysis. Prospective part: All Patients of vasculitis admitted or evaluated in OPD from Oct. 2018 to May 2020 were enrolled for study. Patients were classified as vasculitis if they fulfil ACR / EULAR / EMA / Chapell Hill consensus classification criteria for vasculitis and biopsy.

Results: Our study was an observational study of 77 patients. Majority of patients i.e. 5 (33.33%) each in LVV group belonged to age groups of ≤30 and 31-40 years. In SVV group, majority of patients i.e. 11 (27.5%) belonged to age group of ≤30 years followed by 9 (22.5%) patients each who aged between 31-40 years and 41-50 years. In group LVV there were 12 (80%) males compared to 3 (20%) females. In group SVV, there were 8 (20%) males compared to 32 (80%) females while as 13 (59%) males and 9 (41%) females constituted others group. Chest x-ray was normal was normal in

majority of patients in all three groups. CT Chest was done in 23 patients in which nodules were seen in 7 (35%) patients, 4 (20%) patients each had consolidation, DAH and 2 (10%) patients had ILD. CT head were suggestive of encephalomalacia in 1, ischemic stroke in 1 and normal findings in 1 (33.3%) patients. CT Chest and Head findings were compared in three study groups with SVV group showing abnormal findings as compared to other two groups. Tuberculosis profile was negative in 26 (96.3%) of 27 patients. TB profile was positive in only 1 (11.1%) patient in others group. On NCV, peripheral neuropathy was observed in 11 (68.8%) of the 16 patients. On NCV, peripheral neuropathy was observed in 9 (75%) patients in SVV group and 2 (50%) patients in others group.

Conclusion: Most of abnormalities on CT Chest, Head, and NCV were present in SVV group. They mostly presented with ILD, DAH, encephalomalacia, ischemic stroke, peripheral neuropathy.

Key words

Pulmonary profile, Neurological profile, Vasculitis, LVV, SVV, ACR, EULAR.

Introduction

The vasculitis are a heterogenous group of conditions characterized by blood vessel inflammation and necrosis [1]. Vasculitides are relatively uncommon conditions whose etiology is still poorly understood. Depending on the size, distribution and severity of the affected vessel, vasculitis can result in clinical syndromes that vary in severity from minor self-limiting rash to a life-threating multisystem disorder, recognizing the fact that some vasculitis can affect a wide variety of blood vessels. They are classified as primary or secondary and have their identifiable causes such as infectious agents, drug reactions, systemic autoimmune diseases or malignancy. Since it often begins with nonspecific symptoms and signs, unfolding slowly over weeks or months, vasculitis is one the great diagnostic challenges in all of medicine. Establishing the diagonsis of vasculitis requires lab tests, biopsy of affected vessel or angiogram in some cases or serological tests.

The 1994 International Chapel Hill Consensus Conference on the Nomenclature of Systemic Vasculitis (CHCC 1994) proposed names and definitions for the most common forms of vasculitis. This nomenclature was widely adopted. A second International Chapel Hill Consensus Conference was held in 2012 (CHCC 2012) as per **Table - 1** [1].. The goals were to change names and definitions as appropriate, and add important categories of vasculitis not included in CHCC 1994. Selected sets of classification criteria for the main vasculitis entities as per **Table – 2**.

Objective

- To study the pulmonary and neurological profile of vasculitis patients at a tertiary care centre.

Materials and methods

The present hospital based observational study was conducted in the Department of Internal Medicine, SKIMS Srinagar. The study had two parts; Retrospective and prospective.

Retrospective part: All patients of vasculitis who were admitted or evaluated in OPD from March 2012 to Sept. 2018, were enrolled for the analysis.

Prospective part: All Patients of vasculitis admitted or evaluated in OPD from Oct. 2018 to May 2020 were enrolled for study.

Inclusion Criteria

- Age 18 to 85 years
- Patients fulfilling ACR / EULAR / EMA / Chapell Hill consensus classification criteria and biopsy evidence of vasculitits.
- Patient who give consent

Exclusion Criteria

- Age <18 years and >85 years.
- Patients who refuse to consent.

Table – 1: Summarizes the entities classified as vasculitis and the main subcategories according to the 2012 CHCC nomenclature.

Vasculitis classification		
Primary systemic vasculitis	**Vasculitis category, subcategory or entity**	**Characteristic features**
Large-vessel vasculitis	Takayasu arteritis	Granulomatous Aorto-arteritis usually occurring before age 50 years
	Giant-cell arteritis	Granulomatous Aorto-arteritis predominantly involving the carotid and vertebral arteries occurring after age 50 years and often associated with polymyalgia rheumatica
Medium vessel vasculitis	Poly-artertitis nodosa	Arteritis of medium/small Arteries without small vessel involvement, glomerulonephritis or antineutrophil cytoplasmic antibodies (ANCAs).
	Kawasaki disease	Childhood mucocutaneous lymph node syndrome with arteritis often involving coronary arteries.
Small- vessel vasculitis ANCA associated vasculitis	Microscopic polyangitis	Vasculitis of small/medium vessel and frequent pauci. Immune glomerulonephritis and ANCAs
	Granulomatosis with polyangits (Wegener‟s)	Granulmatous inflammation of the respiratory tract with vasculitis of small/medium vessels and frequent. Pauci-immune glomerulonephritis and ANCAs
	Eosinophilic granulomatosis with Polyangits (Churg-Strauss)	Asthma, Eosinophilia and eosinphilic granulomatous inflammation frequently involving the respiratory tract with vasculitis of small/medium vessels and sometimes ANCAs
Immune-complex smallvessel vasculitis	Antiglomerular basement membrane (anti GBM) disease Cryoglobulinemic vasculitis	Pulmonary and glomerular capillaritis with depositin anti-GBM antibodies Vasculitis with frequent skin, glomerular and peripheral nerve involvement associated with serum cryoglobulins
	Immunoglobuling (Ig) A vasculitis (Henoch-Schonlein)	Arthritis with frequent skin and gastrointestinal vasculities with IgA deposits and possible IgA neuropathy
	Hypocomplementemic urticarial vasculitis (anti-C1q vasculitis)	Urticarial hypocomplementic small vessel vasculitis with anti C1 q antibodies and, articular, glomerular, ocular and bronchial disease
Variable vessel vasculitis	Behcet‟s disease	Recurrent oral and/or genital ulcers with skin, ocular, articular, gastrointestinal, and/or central venous system lesions, and possible variable vessel vasculitis.
	Cogan‟s syndrome	Vasculitis of small, medium or large arteries occurring in Cogan‟s syndrome.

Single organ vasculitis	Cutaneous leukocytoclastic angittis Cutaneous arteritis Primary central nervous system vasculitis Isolated aortitis	Vasculitis in a single organ and no features indicating a limited form of a systemic vasculitis
Vasculitis associatd with systemic disease	Lupus vasculitis Rheumatoid vasculitis Sarcoid vasculitis Other (e.g. IgG_4-related aortitis)	Vasculitis secondary to a systemic disease
Vasculitis associated with probable cause	Hepatitis C virus – associated cryoglobulineic vasculitis Hepatitis B virus associated vasculitis Syphilis-associated aortitis Drug-associated immune complex vasculitis Drug associated ANCA associated vasculitis Others	Vasculitis secondary to specific cause

ANCA = Anti-neutriphil cytoplasmic antibody

Table – 2: Selected sets of classification criteria for the main vasculitis entities.

Vasculitis entity	Classification systems	Comments
Giant cell arteritis	ACR criteria [12] Positive temporal artery biopsy (TAB)	Should be used in combination with vasculitis entry criteria No consensual histological definition for positive TAB Exclude by definition TAB negative disease
Takayasu arteritis	ACR criteria [13] Published by Sharma, et al. [11] EULAR/ PRINTO/ PRES [14]	Should be used in combination with vasculitis entry criteria Expert based criteria Developed for pediatric populations. Should be used with vasculitis entry criteria
Polyarteritis nodosa PAN	CHCC definition [2, 3] ACR criteria [15] FVSG criteria [10] EMA algorithm [16] EULAR/ PRINTO/ PRES [14]	Not intended as classification criteria Should be used in combination with vasculitis entry criteria. Low sensitivity and specificity Should be used in combination with vasculitis entry criteria. Moderate sensitivity and specificity Discriminates PAN from GPA, Developed for pediatric populations. Should be used in combination with vasculitis entry criteria
Kawasaki disease Granulomatosis with polyangitis	American Heart Association [7] ACR criteria [17]	May not work well in adult populations Should be used in combination with vasculitis

(GPA, (Wegner‟s)	Modified ACR criteria [8]	entry criteria Alteration of the ACR criteria [17]. Should be used in combination with vasculitis entry criteria
	EMA algorithm [16]	Discriminates GPA from MPA, EGPA and PAN
	EULAR/ PRINTO/ PRES [14]	Developed for pediatric populations. Should be used in combination with vasculitis entry criteria
Microscopic polyangitis (MPA)	EMA algorithm [16]	Discriminates MPA from GPA, EGPA and PAN
Eosinophilic granulomatosis with polyangitis (EGPA), (Churg-Strauss)	ACR criteria [6]	Should be used in combination with vasculitis entry criteria. Discriminant ability from hypereosinophilic syndrome [HES] unclear
	Published by Lanhan, et al. [18]	Expert-based criteria. Discriminant ability from (HES) unclear
	EMA algorithm [16]	Discriminates EGPA from GPA, MPA and PAN. Discriminant ability from HES unclear
IgA vasculitis (Henoch-Schonlein)	ACR criteria [11]	May not work well in adult populations, should be used in combination with vasculitis entry criteria Discriminates IgA vasculitis from hypersensitivity vasculitis
	Published by Michael, et al. [19]	Developed for pediatric population. Should be used in combination with vasculitis entry criteria
	EULAR/ PRINTO/ PRES [14]	
Cryoglobulinemic vasculitis **Behcet‟s disease**	Published by de Vita, et al. [4]	Validation study published separately [20] More specific than the recently published ICBD criteria [5]
	ICBD [5]	More sensitive than former ISG criteria [9] Expert based criteria.
	1987 JBDRC Criteria [21]	Predominantly used in the Asian content.

ACR - American College of Rheumatology; CHCC - Chapel Hill Consensus Conference; EMA - European Medicines Agency; EULAR/ PRINTO/ PRES - European League against Rheumatism/ Pediatric Rheumatology International Trial Organization/ Pediatric Rheumatology European Society; FVSG - French Vasculitis Study Group; ICBD - International criteria for Behcet‟s disease; ISG - International Study Group; JBDRC - Japanese Behcet's disease research committee

Patients were classified as vasculitis if they fulfill ACR / EULAR / EMA / Chapell Hill consensus classification criteria for vasculitis and biopsy.

No major ethical issues were involved as the study did not involve any interventional experimentation, since it was purely an observational study. However, informed consent for confidentiality and permission for publishing the data was taken.

Statistical methods

The recorded data was compiled and entered in a spreadsheet (Microsoft Excel) and then exported to data editor of SPSS Version 20.0 (SPSS Inc., Chicago, Illinois, USA). Continuous variables were expressed as Mean ± SD and categorical variables were summarized as frequencies and percentages. Graphically the data was presented by bar and pie diagrams.

Results

Our study was an observational study of 77 patients. The data was collected both prospectively 39 (50.6%) and retrospectively 38 (49.4%). Mean age of study patients was 40.9±15.72 years. Our study consisted of male 33 (42.9%), female 44 (57.1%). 62 (80.5%) belonged to rural areas where as 15 (19.5%) was from urban areas. In our study, large vessel vasculitis was present in 15 (19.48%) including Takayasu arthritis in 14 (93.33%) and Giant cell arteritis in 1 (6.67%), medium vessel vasculitis was present in 3 (3.89%) including polyarteritis nodosa in 1 (33.37%) and superior mesentric arteritis in 2 (66.66%), ANCA associated small vessel vasculitis was present in 27 (35.06%) including GPA in 22 (81.48%), EGPA in 4 (14.81%) and MPA in 1 (3.70%), immune complex small vessel vasculitis (IgA vasculitis) was seen in 2 (2.59%). Variable vessel vasculitis (Behcet's disease) was present in 6 (7.79%), single organ vasculitis was seen in 6 (7.79%) patients including cutaneous vasculitis in 4 (68.66%) and CNS vasculitis in 2 (33.34%). Vasculitis associated with systemic disease was present in 4 (5.19%) patients including lupus vasculitis in 2 (50%) and rheumatoid vasculitis in 2 (50%) patients. Vasculitis associated with probable cause (NSAIDs induced vasculitis) was present in 1 (1.29%) patient. Biopsy evidence of vasculitis (not fulfilling criteria for other small vessel vasculitis) was present in 13 (16.88%).

Out of total 77 patients studied, 39 (50.6%) were prospective cases and 38 (49.4%) cases were of retrospective nature (**Table – 3**).

Table - 3: Distribution of study.

Study population	No.	%
Prospective cases	39	50.6
Retrospective cases	38	49.4
Total	77	100

Patients were distributed in three groups viz. LVV (large vessel vasculitis), SVV (small vessel vasculitis) and others. There were 9 (60%) prospective cases and 6 (40%) retrospective cases in LVV group, 22 (55%) prospective cases and 18 (45%) retrospective cases in SVV group while as 8 (36.4%) prospective and 14 (63.6%) retrospective cases constitute others group (**Table – 3A**).

Table – 3A **3A: Distribution of study population**

Study population	LVV		SVV		Others	
	No.	%age	No.	%age	No.	%age
Prospective cases	9	60.0	22	55.0	8	36.4
Retrospective cases	6	40.0	18	45.0	14	63.6
Total	15	100	40	100	22	100

The age of participants of the study ranged between 18-76 years with a mean age of 40.9±15.72 years (**Table – 4**).

Table - 4: Age distribution of study patients.

Age (Years)	No.	%
≤ 30	23	29.9
31-40	19	24.7
41-50	14	18.2
51-60	12	15.6
61-70	9	11.7
Total	77	100
Mean ± SD (Range) = 40.9 ± 15.72 (18-76)		

Table - 4A: Age distribution of study patients.

Age (Years)	LVV		SVV		Others	
	No.	%	No.	%	No.	%
≤ 30	5	33.33	11	27.5	7	31.80
31-40	5	33.33	9	22.5	5	22.72
41-50	3	20.0	9	22.5	2	9.1
51-60	1	6.67	7	17.5	4	18.19
61-70	1	6.67	4	10.0	4	18.19
Total	15	100	40	100	22	100

When groups were distributed as per the age, it was observed that majority of patients i.e. 5 (33.33%) each in LVV group belonged to age groups of ≤30 and 31-40 years. In SVV group, majority of patients i.e. 11 (27.5%) belonged to age group of ≤30 years followed by 9 (22.5%) patients each who aged between 31-40 years and 41-50 years. There were 7 (31.80%) patients in other group who aged ≤30 years followed by 5

(22.72%) patients who belonged to the age group of 41-50 year (**Table – 4A**).

There was a little female predominance in our study with 44 (57.1%) females and 33 (42.9%) males (**Table – 5**).

Table - 5: Gender distribution of study patients.

Gender	No.	%
Male	33	42.9
Female	44	57.1
Total	77	100

Table - 5A: Gender distribution of study patients.

Gender	LVV		SVV		Others	
	No.	%	No.	%	No.	%
Male	12	80.0	8	20.0	13	59.0
Female	3	20.0	32	80.0	9	41.0
Total	15	100	40	100	22	100

When groups were distributed as per the gender, it was observed that in group LVV there were 12 (80%) males compared to 3 (20%) females. In group SVV, there were 8 (20%) males compared to 32 (80%) females while as 13 (59%) males and 9 (41%) females constituted others group (**Table – 5A**).

Underlying co-morbid illnesses with respect to pulmonary and neurological system were observed in 1 (1.3%) patients each in COPD, asthma and ILD. There were 1 (6.66%) patient each with asthma and ILD in LVV group, 1 (2.5%) COPD patient in SVV group. Presenting features in this study were cough and hemoptysis in 12 (15.6%) patients, dyspnea in 8 (10.4%) patients, headache and stroke in 6 (7.8%) patients each, paraesthesia, dizziness were found in 5 (6.5%) patients each. Pheripheral neuropathy in 4 (5.2%) patients. In LVV group, none of the patients came with cough in comparison with 11 (27.5%) patients in SVV group and 1 (4.54%) patient in others group. Hemoptysis was seen in 12 (30%) patients in SVV group, dyspnea in 3 (20%) patients in LVV group, 8 (20%) patients in SVV group and 1 (4.54%) patients in others group. Headache was seen in 4(26.66%) in LVV group and in SVV group headache was seen in 2 (5.0%) patients and stroke in 5(12.5%) patients. In other group stroke was seen 1 (4.54%) and seizure in 1(4.54%)

Chest X-ray was normal in 55 (71.4%) patients, infiltrates in 10 (13%) patients, consolidation in 5 (6.5%) patients, reticular pattern in 2 (2.6%) patients, cardiomegaly in3 (3.9%) patients, while as 1(1.3%) patient each had nodules and effusion (**Table – 6**).

Table - 6: Chest X-ray findings of study patients.

Chest X-ray findings	No.	%
Normal	55	71.4
Infiltrates	10	13.0
Consolidation	5	6.5
Reticular Pattern	2	2.6
Nodules	1	1.3
Cardiomegaly	3	3.9
Effusion	1	1.3
Total	77	100

Table - 6A: Chest X-ray findings of study patients.

Chest X-ray findings	LVV		SVV		Others	
	No.	%	No.	%	No.	%
Normal	13	86.66	24	60.0	18	81.81
Infiltrates	0	0.0	9	22.5	1	4.5
Consolidation	0	0.0	3	7.5	2	9.09
Reticular Pattern	0	0.0	2	5.0	0	0
Nodules	1	6.66	0	0.0	0	0
Cardiomegaly	1	6.66	1	2.5	1	4.5
Effusion	0	0.0	1	2.5	0	0
Total	15	100	40	100	22	100

Chest X-ray was normal in 13 (86.66%) patients in LVV group, 24 (60%) patients in SVV group and 18 (81.81%) patients in others group. Infiltrates were seen in 9 (22.5%) patients in SVV group only, consolidation was seen in 3 (7.5%) patients in SVV group and 2 (9.09%) patients in others group. Reticular pattern was seen in 2 (5%) patients in SVV group, nodules were seen in 1 (6.66%) patient in LVV group. Cardiomegaly was seen in 1 (6.66%) patient in

LVV group, 1 (2.5%) in SVV group and 1 (4.5%) patients in others group. Effusion was seen in 1 (2.5%) patients in SVV group (**Table – 6A**).

Table - 7: CT findings of study patients.

CT Findings	No.	%
Normal	6	30
Nodules	7	35
ILD	2	10
Consolidation	4	20
DAH	4	20
Normal	1	33.3
Encephalomalacia	1	33.3
Ishchemic stroke	1	33.3

CT Chest was done in 23 patients in which nodules were seen in 7 (35%) patients, 4 (20%) patients each had consolidation, DAH and 2 (10%) patients had ILD. CT head were suggestive of encephalomalacia in 1, ischemic stroke in 1 and normal findings in 1 (33.3%) patients (**Table – 7**).

CT Chest and Head findings were compared in three study groups with SVV group showing abnormal findings as compared to other two groups (**Table – 7A**).

Tuberculosis profile was negative in 26 (96.3%) of 27 patients (**Table – 8**).

Table - 7A: CT findings of study patients.

CT Findings		LVV		SVV		Others	
		No.	%	No.		No.	%
Chest	Normal	0	0.0	5	29.4	1	33.3
	Nodules	0	0.0	7	41.2	0	0.0
	ILD	0	0.0	0	0.0	2	66.7
	Consolidation	0	0.0	4	23.5	0	0.0
	DAH	0	0.0	4	23.5	0	0.0
Head	Normal	1	100	0	0.0	0	0.0
	Encephalomalacia	0	0.0	1	100	0	0.0
	Ishchemic stroke	0	0.0	0	0.0	1	100

Table - 8: TB profile of study patients.

TB Profile	No.	%
Positive	1	3.7
Negative	26	96.3
Total	27	100

TB profile was positive in only 1 (11.1%) patient in others group (**Table – 8A**).

On NCV, peripheral neuropathy was observed in 11 (68.8%) of the 16 patients (**Table – 9**).

Table - 8A: TB profile of study patients.

TB profile	LVV		SVV		Others	
	No.	%	No.		No.	%
Positive	0	0.0	0	0.0	1	11.1
Negative	2	100	16	100	8	88.9

On NCV, peripheral neuropathy was observed in 9 (75%) patients in SVV group and 2 (50%) patients in others group (**Table – 9A**).

Table - 9: NCV findings of study patients.

NCV Findings	No.	%
Normal	5	31.3
Peripheral neuropathy	11	68.8
Total	16	100

Table - 9A: NCV findings of study patients.

NCV findings	LVV		SVV		Others	
	No.	%	No.	%	No.	%
Normal	0	0.0	3	25.0	2	50
Peripheral neuropathy	0	0.0	9	75.0	2	50

Final diagnosis was GPA in 22 (28.6%) patients, TA in 14 (18.2%) patients, biopsy evidence of

SVV in 13 (16.88%) patients, Behcets disease in 6 (7.8%) patients, cutaneous vasculitis in 4 (5.1%) patients, EGPA in 4 (5.1%) patients. Two patients each were diagnosed as IgA Vasculitis, lupus vasculitis and CNS vasculitis. PAN, GCA and NSAID induced vasculititis were the diagnosis of 1 (1.3%) patient each (**Table – 10**).

Table - 10: Final diagnosis of study patients.

Diagnosis	No.	%
TA	14	18.2
GPA	22	28.6
EGPA	4	5.2
MPA	1	1.3
Behcets disease	6	7.8
Ig A Vasculitis	2	2.6
NSAID induced vasculitis	1	1.3
Lupus vasculitis	2	2.6
SLE with SVV	1	1.3
Cutaneous vasculitis	3	3.9
SLE with cutaneous vasculitis	1	1.3
CNS vasculitis	2	2.6
Rheumatoid vasculitis	1	1.3
RV with intersitial pheumonia	1	1.3
GCA	1	1.3
Isolated SMA vasculitis	1	1.3
SVV	10	13.0
PAN with ILD	1	1.3
SVV with IgA nephropathy	1	1.3
SLE with SMA vasculitis	1	1.3
UCTD with SVV	1	1.3
Total	77	100

Discussion

In our study, chest X-ray was normal in 55 (71.4%) patients, infiltrates in 10 (13%) patients, consolidation in 5 (6.5%) patients, reticular pattern in 2 (2.6%) patients, cardiomegaly in 3 (3.9%) patients, while as 1 (1.3%) patient each had nodules and effusion. Chest X-ray was normal in 13 (86.66%) patients in LVV group, 24 (60%) patients in SVV group and 18 (81.81%) patients in others group. Infiltrates were seen in 9 (22.5%) patients in SVV group only, consolidation was seen in 3 (7.5%) patients in SVV group and 2 (9.09%) patients in others group. Reticular pattern was seen in 2 (5%) patients in SVV group, nodules were seen in 1 (6.66%) patient in LVV group. Cardiomegaly was seen in 1 (6.66%) patient in LVV group, 1 (2.5%) in SVV group and 1 (4.5%) patients in others group. Effusion was seen in 1 (2.5%) patients in SVV group. Similar results were compared with Lane SE, et al. (2005) [24] conducted a study in which nodules / cavitation were seen in 15 of 16 (93.75%) patients and infiltration and effusion 21 of 22 (95.45%) on X-ray / CT scan. CT Chest was done in 23 patients in which nodules were seen in 7 (35%) patients, 4 (20%) patients each had consolidation, DAH and 2 (10%) patients had ILD. CT head were suggestive of encephalomalacia in 1, ischemic stroke in 1 and normal findings in 1 (33.3%) patients. Abdomen CT was done in 2 patients and were suggestive of aortitis and SMA non-occlusive thrombus in 1 (50%) patient each. CT Chest, Head and Abdomen findings were compared in three study groups with SVV group showing abnormal findings as compared to other two groups. Feragalli B, et al. (2016) [27] conducted a study to describe radiographic and high-resolution CT (HRCT) findings of pulmonary vasculitis and to correlate radiological findings with pa. In our study, tuberculosis profile was negative in 26 (96.3%) of 27 patients and positive in 1 (3.7%). When tuberculosis profile was compared with three study groups, it was observed that TB profile was positive in only 1 (11.1%) patient in other group. Sheikhzadeh, et al. [26], had a 34.6% rate of PPD positivity. This was reported to be 48%, 81% and 20% in other studies [29, 30, 31]. In our study, 40.0% of patients had a positive PPD test result, suggesting an association between prior mycobacterium tuberculosis exposure and TA. No patient in our study had active tuberculosis, similar to a study in Tunisia [32]. Nooshin D, et al. (2013) [22] conducted a study 6 patients (40.0%) had purified-protein derivative PPD > 10 mm. In our study, on NCV peripheral neuropathy was observed in 11 (68.8%) of the 16 patients including 9 (75%) patients in SVV group and 2 (50%) patients in others group. Similar results were observed by Sinico RA, et al. (2005) [28]

conducted a study in which peripheral neuropathy was seen in 60 (64.5%) patients. Peripheral nervous system was also observed in 8 (22%) in ANCA associated vasculitis and 4 (29%) in MPA and 1 (6%) in GPA.

Final diagnosis was Takayasu arthritis in 14 (93.33%) and giant cell arteritis in 1 (6.67%), polyarteritis nodosa in 1 (33.37%) and superior mesentric arteritis in 2 (66.66%), GPA in 22 (55%), EGPA in 4 (14.81%) and MPA in 1 (3.70%), IgA vasculitis was seen in 2 (2.59%). Behcet's disease was present in 6 (7.79%), cutaneous vasculitis in 4 (68.66%) and CNS vasculitis in 2 (33.34%). Lupus vasculitis in 2 (50%) and rheumatoid vasculitis in 2 (50%) patients. NSAIDs induced vasculitis was present in 1 (1.29%) patient. Biopsy evidence of vasculitis (not fulfilling criteria for other small vessel vasculitis) was present in 13 (16.88%).

Pimentel-Quiroz VR, et al. (2020) [25] did a study to identify the demographic and clinical features of patients with ANCA-associated vasculitides (AAVs) in a Peruvian tertiary referral hospital. Two hundred twelve patients were included. One hundred fifty-eight patients (74.5%) had MPA, 42 (19.8%) GPA, 7 (3.3%) RLV, and 5 (2.4%) EGPA. Similar observations were made by Ahn SS, et al. (2020) [23] who conducted a study in which 35 (52.2%), 19 (28.4%), and 13 (19.4%) patients were diagnosed with microscopic polyangiitis, granulomatosis with polyangiitis, and eosinophilic granulomatosis with polyangiitis, respectively. thological results.

Conclusion

Out of total 77 patients studied, 39 (50.6%) were prospective cases and 38 (49.4%) cases were of retrospective nature. There were 9 (60%) prospective cases and 6 (40%) retrospective cases in LVV group, 22 (55%) prospective cases and 18 (45%) retrospective cases in SVV group while as 8 (36.4%) prospective and 14 (63.6%) retrospective cases constitute others group.

Majority of patients i.e. 5 (33.33%) each in LVV group belonged to age groups of $\leq$30 and 31-40 years. In SVV group, majority of patients i.e. 11 (27.5%) belonged to age group of $\leq$30 years followed by 9 (22.5%) patients each who aged between 31-40 years and 41-50 years.

In group LVV there were 12 (80%) males compared to 3 (20%) females. In group SVV, there were 8 (20%) males compared to 32 (80%) females while as 13 (59%) males and 9 (41%) females constituted others group. Chest X-ray was normal in majority of patients in all three groups.

CT Chest was done in 23 patients in which nodules were seen in 7 (35%) patients, 4 (20%) patients each had consolidation, DAH and 2 (10%) patients had ILD. CT head were suggestive of encephalomalacia in 1, ischemic stroke in 1 and normal findings in 1 (33.3%) patients.

CT chest and head findings were compared in three study groups with SVV group showing abnormal findings as compared to other two groups.

Tuberculosis profile was negative in 26 (96.3%) of 27 patients. TB profile was positive in only 1 (11.1%) patient in others group.

On NCV, peripheral neuropathy was observed in 11 (68.8%) of the 16 patients. On NCV, peripheral neuropathy was observed in 9 (75%) patients in SVV group and 2 (50%) patients in others group.

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