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Original Research Article

An Aetiological and Clinicohistopathological Study on Cutaneous Vasculitis – A Cross Sectional Study

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Abstract:

Background: Cutaneous vasculitis is to the inflammation that occurs in these cutaneous blood vessels, which leads to blood flow changes, ischemia and damage. The condition can affect any blood artery, although it most commonly affects the post-capillary venules. Frequently, the illness is a component of a systemic disorder affecting the walls of blood vessels; therefore the appearance of skin symptoms is the first indication of the overall disease progression. The involvement of the dermatologist is crucial in the diagnosis and subsequent treatment of these illnesses.

Objectives: To study the etiology and cutaneous as well as systemic manifestations in patients of cutaneous vasculitis**.**

Methodology: This cross-sectional study was done at Department of Dermatology, SCB Medical College & Hospital from June 2020 to November 2021 among all age group of patients who were filling the inclusion criteria.

Results: Our study included 65 patients attending dermatology OPD with clinical evidence of cutaneous vasculitis. Mean age of patients was 32.44 + 17.9 years. To assess the normality of data, Kolmogorov-Smirnov test was performed. The data set was observed to have normal distribution. Among the all study participants 55% of the study participants were male and almost 45% were female.

Conclusion: The majority of patients who had cutaneous vasculitis exhibited polymorphic lesions, while most of them showed with palpable purpura. Leukocytoclastic vasculitis had been the most prevalent kind of vasculitis observed during histological testing. A skin biopsy revealing leukocytoclastic vasculitis failed to show evidence of systemic involvement. It cannot demonstrate that there was involvement of larger blood vessels. The cause of this medical issue could not be determined in most of the participants in the present study.

Keywords: Clinicohistopathological, Cutaneous vasculitis, Systemic manifestations, Etiological aspects.

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Introduction

Vasculitis is a condition characterized by localized inflammation of the outermost layer of a blood vessel or lymph vessel. The skin, which is the largest organ in the human body, is abundantly supplied with blood vessels. Cutaneous vasculitis is the condition where the blood vessels in the skin become inflamed, leading to changes in blood flow, reduced oxygen supply, and tissue damage.[1] The condition can affect any blood vessel, however it most commonly affects the post-capillary venules. [2] Frequently, the illness is a component of a systemic disorder affecting the walls of blood vessels, and the appearance of skin symptoms is the first indication of the overall disease progression. The role of the dermatologist is crucial in both diagnosing and managing these illnesses. The manifestation of cutaneous vasculitis is characterized by a diverse array of clinical and pathological features. The pathogenic processes and clinical signs of the condition are diverse. Histologic confirmation is necessary to definitively diagnose vasculitis, as only a few vasculitis syndromes exhibit clinical, radiographic, and/or laboratory symptoms that are characteristic enough

to establish a conclusive diagnosis. Nevertheless, relying just on histopathologic diagnosis is insufficient and necessitates correlation with clinical, physical, and laboratory findings. The etiopathogenesis of several cutaneous vasculitis remains unknown.

In several circumstances, the presence of drugs or diseases can serve as antigenic stimuli. The typical latency period for the development of vasculitis after exposure to a stimulus is often 7-10 days. In several situations, the causal cause may be attributed to underlying conditions such as connective tissue diseases, inflammatory bowel diseases (IBD), or internal cancers.[3]

The skin often displays manifestations of both systemic and localized vasculitides due to the ample vascular supply in the dermis and subcutaneous tissue, the hydrostatic pressure within these blood vessels, and their closeness to environmental factors. [4] From a clinical perspective, vasculitis can appear in a variety of ways, depending on the size of the affected blood vessel. Palpable purpura is the most often seen skin manifestation. Often, this is the sole occurrence.

Additional skin symptoms may include papules, nodules, vesicles, pustules and/or vesiculo-bullous lesions. The lesions have the potential to develop into ulcerative necrotic lesions, which eventually heal and leave behind post-inflammatory pigmentation. Livedo reticularis is a distinct symptom of vasculitis, marked by a pattern of mottled red or blue discolouration that resembles a net. This particular abnormality is commonly observed in the lower extremities, especially in areas that are susceptible to reduced blood flow.

Systemic symptoms such as fever, loss of appetite, joint pain, and muscle pain may accompany cutaneous signs. [5] The succeeding sections provide a more detailed discussion on the specific clinical aspects observed in distinct cases of vasculitis. We conducted a research on this mysterious medical condition in a tertiary care hospital, aiming to better understand the patterns of distribution of disease and the varied clinical and histopathological presentations.

Objectives:

1. To study the cutaneous and systemic manifestations in cutaneous vasculitis
2. To study the etiological aspects in patients with cutaneous vasculitis

Material and Methods:

This cross-sectional study was done at Department of Dermatology, SCB Medical College & Hospital from June 2020 to November 2021 among all age group of patients who were filling the inclusion criteria.

Sample Size - Convenient sampling

Inclusion Criteria:

All patients of with clinical evidence of cutaneous vasculititis with simultaneous crops of palpable purpura Papule, urticated plaque, nodules, vesicles, bullae, pustule, ulcer & necrosis. Other cutaneous findings like livedo reticularis and edema.

Exclusion Criteria:

1. Patients with thrombocytopenia <50,000/mm3
2. Patients with disorder of coagulation
3. Patients who are on warfarin or heparin
4. Patients not giving consent to undergo biopsy
5. Pregnant females

Methodology:

After obtaining ethical clearance, according to inclusion and exclusion criteria, patients presenting to the Outpatient Department of Skin & V. D and patients referred from other departments for evaluation within the period of study was taken after taking consent.

A comprehensive clinical history was obtained, including information on age, sex, duration of the illness, existence of other related symptoms, and history of drug usage. A history of drug exposure was deemed important if it occurred within one month of the onset of the lesions.

Any significant past illness & co-morbid condition was recorded Baseline investigation like complete blood count, LFT,RFT, bleeding time, clotting time, ESR,CRP, AS0 titre & marker for hepatitis B,C & HIV and relevant autoantibodies like ANA, ANCA, RA factor, chest x ray, stool occult blood has been done depending upon history and clinical examination.

A diagnosis was attempted by analyzing clinical findings, and an etiological relationship was established by analysis of the clinical history and investigations. All patients underwent histopathological evaluation of the skin biopsies from the affected area. A skin biopsy was performed under sterile conditions on all individuals with lesions that were less than 48 hours old.

A conventional 5mm disposable punch was employed to extract the biopsy. Sections were formalin fixed and sent for histopathology study.

The pathological diagnosis in each case was confirmed by review of haematoxylin and eosin stained sections. Direct immunofluorescence was done in addition to histopathology depending on clinical presentation.

Appropriate clinical photograph were taken with consent. All data were compiled, tabulated, and

analyzed using statistical software SPSS version 27.

Observation and Results:

Our study included 65 patients attending dermatology OPD with clinical evidence of cutaneous vasculitis. Mean age of patients was 32.44±17.9 years. To assess the normality of data, Kolmogorov-Smirnov test was performed. The data set was observed to have normal distribution. Among the all study participants 55% of the study participants were male and almost 45% were female.

Table 1: Age and sex distribution among the study participants

Age Group (n=65)	Frequency	Percentage
< 15 Years	13	20.0
15-40 Years	34	52.3
40-60 Years	11	16.9
>60 Years	7	10.8
Sex	Male	Female
	36	55.4
	29	44.6

Table 2: Distribution of clinical diagnosis among the study participants

Clinical diagnosis (n=65)	Frequency	Percentage
Cutaneous Small Vessel Vasculitis (CSVV)	42	64.6
Henoch - Schonlein Purpura (HSP)	12	18.5
Urticarial Vasculitis (UV)	8	12.3
Cutaneous Polyarteritis Nodosa (C PAN)	1	1.5
Nodular Vasculitis	1	1.5
Acute Hemorrhagic edema of infancy (AHEI)	1	1.5

Above table shows more than 60% of the participants were clinically diagnosed with cutaneous small vessel vasculitis followed by Henoch Schonlein Purpura (18.5%), urticarial vasculitis (12.3%), and C PAN, nodular vasculitis and AHEI each (1.5%).

Table 3: Distribution of clinical manifestations among various age groups

Clinical Diagnosis	<15 Years	15-40 Years	40-60 Years	>60 Years
CSVV	1	27	8	6
HSP	8	2	1	1
UV	2	5	1	0
C PAN	1	0	0	0
Nodular Vasculitis	0	0	1	0
AHEI	1	0	0	0

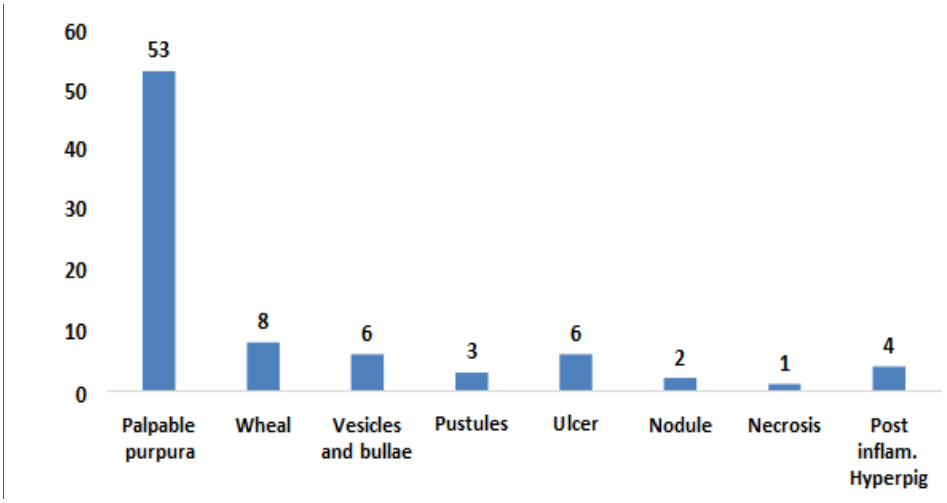

Figure 1: Distribution of cutaneous manifestations among the study participants

Figure 1 shows distribution of cutaneous manifestations among the study participants. More than 80 % of the study participants presented with palpable purpura followed by wheal (12.3%), vesicles and bullae (9.2%) and ulcer (9.2%). Other cutaneous manifestations included post-inflammatory hyperpigmentation, pustules, nodule and necrosis.

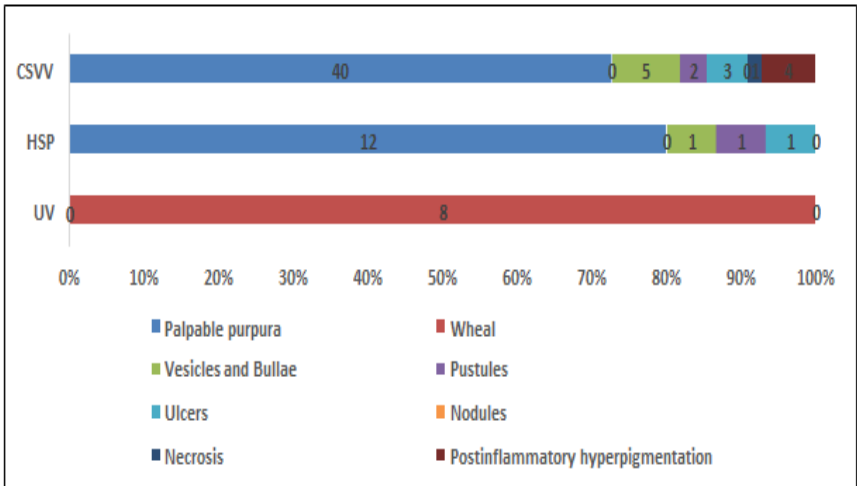

Figure 2: Distribution of cutaneous manifestations among patients with different clinical diagnosis

Figure 2 shows distribution of various cutaneous manifestations according to the clinical diagnosis. 40 patients with CSVV presented with palpable purpura .Among them 5 had vesicles and bullae, 2 had pustules,1 with with ulcer and necrosis each and 4 had post inflammatory hyperpigmentation. 12 patients with HSP presented with palpable purpura, among them 1 patient presenting with vesicles and bullae, 1 with pustules and 1 with ulcers. All the patients who were diagnosed with UV presented with only wheal.

Table 4: Distribution of systemic manifestations among the study participants

Systemic manifestation*	Frequency	Percentage
Abdominal pain	11	16.9
Fever	12	18.5
Joint pain	19	29.3
Joint swelling	7	11
Diarrhoea	8	12.3
No symptom	35	53.8

*Multiple responses observed. Table 4 shows distribution of systemic manifestations among the study participants. Almost half of the study participants had no systemic symptom. Most common systemic symptom was found to be joint pain (29.3%), followed by fever (18.5%), abdominal pain (16.9%), diarrhoea (12.3%) and joint swelling (11%).

Table 5: Distribution of systemic manifestations among patients with different clinical diagnosis

Clinical Diagnosis	Abdominal pain	Fever	Joint pain	Joint swelling	Diarrhoea	No symptom
CSVV	3	9	10	2	0	26
HSP	8	2	8	4	8	0
UV	0	1	0	0	0	7
C PAN	0	0	1	1	0	0
Nodular Vasculitis	0	0	0	0	0	1
AHEI	0	0	0	0	0	1

Table 5 shows distribution of various systemic manifestations according to the clinical diagnosis. Patients diagnosed with CSVV presented with the clinical symptom of joint pain (10), fever (9), abdominal pain (3) and joint swelling (2). No systemic symptoms were observed among 26 patients diagnosed clinically with CSVV. Joint pain, abdominal pain and diarrhoea were the most common systemic symptom among patients with HSP. Majority of the patients diagnosed with UV presented with no systemic symptom

Table 6: Distribution of etiological factors and various drugs as etiological factors among the study participants (n=65)

Etiological Factors	Frequency	Percentage
Drugs	15	23.1
Infection	11	16.9
Connective Tissue disease	3	4.6
Idiopathic	36	55.4
Drugs(n=15)	**Frequency**	**Percentage**
Antibiotics	10	66.6%
NSAID	4	27%
Sulfasalazine	1	6%

Table 6 shows distribution of participants according to the etiological factors. Most common cause was found to be idiopathic (55.4%), followed by drugs (23.1%), infection (16.9%), and connective tissue disease (4.6%) and most common etiological drug was found to be antibiotics (67%), followed by NSAIDs (27%) and Sulfasalazine in 6%.

Discussion

The understanding of cutaneous vasculitis is limited due to its diverse clinical presentation and its association with various infections, connective tissue disorders, and malignancies. This study examines instances of cutaneous vasculitis that were identified based on the patient's medical history, clinical characteristics, and a range of laboratory testing. The skin biopsy provided corroborating evidence for the clinical diagnosis. We conducted a research including 65 individuals diagnosed with cutaneous vasculitis. These patients were evaluated using histology and laboratory data. The research included patients ranging in age from 1 to 75 years, with an average age of 32 years. The majority of patients (52.3%) fell within the age range of 15 to 40 years, followed by those under 15 years old (20%) and those between 41 and 60 years old (16.9%). Our study found a higher incidence rate in males (55.4%) compared to females (44.6%), resulting in a male to female ratio of 1.2:1. This ratio aligns with the findings of a prior study. [6,7] The study done by Khetan et al found that the highest number of patients were between the age range of 16-30 years, followed by the age range of 31-45 years. [8]

In contrast, Betty Alexander and colleagues' study reported that the majority of patients were between 30 and 40 years old. [7] In the present research, 12 (18.5%) patients had HSP and 8 (12.3%) had urticarial vasculitis. One patient (1.5%) had cutaneous polyarteritis nodosa, nodular vasculitis, and acute hemorrhagic edoema of infancy, each occurring separately. Rest of the patients that is 42(64.6%) patients were categorised as cutaneous small vessel vasculitis. Khetan et al [8] found that 37.7% of patients had hypersensitivity vasculitis (HSV), 26.2% had Henoch-Schonlein purpura, 6.5% had connective tissue disease and urticarial vasculitis each, and 1.6% had microscopic polyangiitis, Wegener's granulomatosis, polyarteritis nodosa, and Takayasu's arteritis each. The remaining patients were classified as having unclassified vasculitis. Palpable purpura was the most prevalent cutaneous symptom, observed in 81.5% of the patients. These findings align with prior research, which found that palpable purpura was the most often seen presentation in 86%, 70.5%, and 89.2% of the patients. [8-10] Our investigation found that wheals were observed in 12.3% of the patients, vesicles and bullae in 9% each, ulcers in 9%, post inflammatory hyperpigmentation in 6%, pustules in 4.6%, and nodules in 3% of the cases. Sais et al [9] documented the presence of ulcers, pustules, nodules, UV, and livedo reticularis in 20.3%, 16.5%, 10%, 8.2%, and 6.3% of cases, respectively. Systemic involvement was detected in 46% of the cases. This corresponded to a similarity rate of 51% and 50% as documented by Ekenstam et al [11] and Gupta et al [10] respectively. Joint pain was the prevailing symptom in 29% of instances. The knee joint was the primary joint affected. Subsequently, symptoms of fever, stomach discomfort, and diarrhoea manifested.

Conclusion

This study effectively demonstrates the diversity of cutaneous vasculitis. Cutaneous vasculitis can vary in severity, ranging from a harmless and self-limiting condition to a progressive systemic illness. Any organ's blood vessels can be impacted, leading to a diverse range of indications and symptoms. Early recognition and treatment of this category of illnesses can greatly decrease the morbidity and mortality rates.

The majority of patients with cutaneous vasculitis exhibited polymorphic lesions, while most of them showed with palpable purpura. Leukocytoclastic vasculitis was the most prevalent kind of vasculitis observed during histological testing. A skin biopsy revealing leukocytoclastic vasculitis did not provide evidence of systemic involvement. It is unable to demonstrate the participation of larger vessels. The cause of the condition could not be determined in most of the participants in the current study.

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