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Original Research Article

An Etiological and Clinico-Histopathological Research on Cutaneous Vasculitis: A Cross Sectional Study

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Abstract:

Background: The inflammation that develops in the cutaneous blood vessels, causing ischemia, damage, and alterations in blood flow, is known as cutaneous vasculitis. Though it often affects the post-capillary venules, the disorder can affect any blood vessel. Since the disease is often a part of a systemic sickness that affects blood vessel walls, the onset of skin symptoms often signals the beginning of the entire disease development. The dermatologist's participation is essential to the diagnosis and treatment of these conditions.

Objectives: The objective of this study is to investigate the causes and examine dermatological and overall symptoms among patients with cutaneous vasculitis.

Material and Method: This cross-sectional study was conducted in the Department of Dermatology, Medical College & Hospital in southern India. The study included patients of all age groups who met the specified inclusion criteria.

Results: The research comprised 65 individuals who visited the dermatology outpatient department and displayed clinical signs of cutaneous vasculitis. The average age of the patients was 32.44 years with a standard deviation of 17.9 years. The Kolmogorov-Smirnov test was conducted to evaluate the normality of the data. The data set had a normal distribution. Out of all the research participants, 55% were male and about 45% were female.

Conclusion: Most patients with cutaneous vasculitis presented with polymorphic lesions, and the majority of them displayed palpable purpura. Leukocytoclastic vasculitis was the predominant kind of vasculitis detected in histological examinations. A skin biopsy, which showed leukocytoclastic vasculitis, did not provide any indication of systemic involvement. It is unable to provide evidence of the presence of bigger blood vessels. The etiology of this medical condition remained undetermined in the majority of subjects in the current investigation.

Keywords: Clinico-Histopathological, Cutaneous Vasculitis, Systemic Manifestations.

Introduction

Vasculitis is a medical illness that involves inflammation in the outermost layer of a blood vessel or lymph vessel in a specific area. The skin, being the biggest organ in the body of an individual, is well endowed with blood arteries. Cutaneous vasculitis is characterized by inflammation of the blood vessels in the layer of skin, resulting in alterations in blood circulation, decreased oxygen delivery, and harm to the tissues.[1] This disorder can impact any blood artery, however it typically impacts the post-capillary venules most frequently. [2] Oftentimes, the sickness is a constituent of a systemic problem impacting the outer layer of blood vessels, and the manifestation of skin symptoms is the initial indicator of the overall disease development. The dermatologist plays a vital role in both identifying and controlling these disorders. The presentation of cutaneous vasculitis is characterized by a wide range of clinical and pathological characteristics. The etiology and clinical manifestations of the illness are varied. Histological confirmation is essential for a clear diagnosis of vasculitis, as only a limited number of vasculitis syndromes display the clinical, radiological, and/or laboratory signs that are sufficiently distinct for a conclusive diagnosis. However, depending solely on histopathologic diagnosis is inadequate and requires linkage between clinical, physical, as well as laboratory results. The cause and development of

various skin vasculitis conditions are still not understood. Under some conditions, the existence of pharmaceuticals or illnesses can act as antigenic triggers. The average latency period for the onset of vasculitis following exposure to stimuli is commonly 7-10 days.

The primary cause in many scenarios might be ascribed to underlying disorders that include connective tissue diseases, inflammatory bowel diseases (IBD), or internal malignancies.[3] The skin frequently exhibits symptoms of both systemic and localized vasculitides because it has abundant supply of blood in the dermis and subcutaneous tissue, the blood vessels in these areas have high pressure, and they are in close proximity to environmental variables. [4] Vasculitis can manifest in several ways clinically, based on the dimension of the blood artery that is damaged. The most often observed cutaneous symptom is palpable purpura. Frequently, this is the only instance. Other skin symptoms might involve little raised bumps, solid lumps, fluid-filled blisters, pus-filled bumps, and/or blisters filled with fluid and blood. The lesions possess the capacity to progress into ulcerative necrotic lesions, which eventually undergo healing and result in post-inflammatory pigmentation. Livedo-reticularis is a characteristic manifestation of vasculitis, characterized by a reticulated appearance of mottled red or blue discoloration that resembles a net. This specific anomaly is frequently seen in the lower limbs, particularly in regions that are prone to diminished blood circulation. Systemic manifestations such as elevated body temperature, decreased desire to eat, discomfort in the joints, and discomfort in the muscles may be present alongside visible skin indications. [5] The next sections offer a comprehensive analysis of the particular clinical characteristics found in different instances of vasculitis. We undertook a study on this enigmatic medical ailment in a specialized hospital, with the goal of gaining a deeper understanding of the disease's distribution patterns and the diverse clinical and histological manifestations.

Objectives:

1. To investigate the systemic and cutaneous signs of cutaneous vasculitis
2. Investigating the etiology of cutaneous vasculitis in patients affected with it.

Material and Methods:

This cross-sectional study included patients of all ages who met the inclusion criteria, and it was conducted at the dermatology department of Medical College & Hospital in southern India.

Sample Size: Convenient sampling

Criteria for Inclusion: Every patient exhibiting palpable purpura along with clinical signs of cutaneous vasculititis Papule, pustule, ulcer, vesicles, urticated plaque, bullae, and necrosis. Additional skin observations, such as, edema and livedo-reticularis.

Criteria for Exclusion:

1. Individuals with thrombocytopenia less than 50,000/mm3
2. Individuals with coagulation disorders
3. Individuals using heparin or warfarin
4. Individuals refusing to provide consent for a biopsy
5. Women who are pregnant

Methodology:

Patients coming to the Skin & V. D. Outpatient Department and patients referred from different departments for examination throughout the research period were taken after getting ethical approval and in accordance with the inclusion and exclusion criteria. Consent was also obtained. A thorough clinical history was acquired, encompassing details on age, gender, length of sickness, presence of additional associated symptoms, and past medication use. If previous instances of drug use happened within a month of the lesions starting, it was considered significant. Every important prior ailment and co-occurring disease was noted. Based on the patient's history and clinical examination, baseline investigations such as complete blood counts, LFTs, RFTs, bleeding and clotting times, ESRs, CRPs, AS0 titres, and markers for HIV, hepatitis B, C, and C as well as pertinent auto-antibodies such ANA, ANCA, RA factors, chest x-rays, and stool occult blood have been completed. An etiological link was formed by analyzing the clinical history and examinations, and a diagnosis was sought by analyzing the clinical results. Every patient had skin samples from the afflicted region evaluated histopathologically. Every person whose lesion was older than 48 hours had a skin biopsy done in a sterile environment. To remove the biopsy, a standard 5mm disposable punch was used. After being formalin fixed, sections were sent for histopathological analysis. Reviewing sections stained with hematoxylin and eosin allowed for the confirmation of the pathological diagnosis in every scenario. Depending on the clinical presentation, direct immune-fluorescence was performed in addition to histology. With agreement, appropriate clinical photos were obtained. SPSS version 27 statistical software was used to assemble, tabulate, and analyze all of the data.

Observation and Results:

65 individuals with clinical signs of cutaneous vasculitis who were seen in the dermatology outpatient department were included in our research. The patients' average age was 32.44±17.9

years. The Kolmogorov-Smirnov test was run in order to determine whether the data were normal. It was found that the data set had a normal distribution. Approximately 45% of research participants were female, and 55% of study participants were male.

Table 1: Demographic profile

Age Group (n=65)	Frequency (n)	Percentage (%)
< 15 Years	13	20.00
15-40 Years	34	52.31
40-60 Years	11	16.92
>60 Years	07	10.76
Gender	Male	Female
	36	55.38
	29	44.61

Table 2: Distribution of clinical diagnosis among cases

Clinical diagnosis (n=65)	Frequency (n)	Percentage (%)
Cutaneous Small Vessel Vasculitis (CSVV)	42	64.61
Henoch - Schonlein Purpura (HSP)	12	18.46
Urticarial Vasculitis (UV)	08	12.30
Cutaneous Polyarteritis Nodosa (C PAN)	01	1.53
Nodular Vasculitis	01	1.53
Acute Hemorrhagic edema of infancy (AHEI)	01	1.53

According to the above data, cutaneous small vessel vasculitis accounted for almost 60% of the participants' clinical diagnoses. Henoch Schonlein Purpura (18.46%), urticarial vasculitis (12.30%), C PAN, nodular vasculitis, and AHEI each (1.53%) were the next most common diagnoses.

Table 3: Clinical presentation distribution across age groups

Clinical Diagnosis	<15 Years	15-40 Years	40-60 Years	>60 Years
CSVV	01	27	08	06
HSP	08	02	01	01
UV	02	05	01	0
C PAN	01	0	0	0
Nodular Vasculitis	0	0	01	0
AHEI	01	0	0	0

Palpable purpura was evident in almost 80% of the research subjects, with wheal (12.3%), vesicles & bullae (9.2%), and ulcer (9.2%) following closely behind. There were also nodules, necrosis, pustules, and post-inflammatory hyperpigmentation on the skin. Palpable purpura was found in 40 CSVV patients. Five of them had bullae and vesicles, two had pustules, one had necrosis and ulcers, and four had post-inflammatory hyperpigmentation. Twelve HSP patients had palpable purpura at presentation; three of them had pustules, one had ulcers, and one had vesicles and bullae.

The sole symptom present in every patient with a UV diagnosis was wheal.

Table 4: Systemic symptoms and their distribution among research participants

Systemic manifestation*	Frequency (n)	Percentage (%)
Abdominal pain	11	16.92
Fever	12	18.46
Joint pain	19	29.23
Joint swelling	07	10.76
Diarrhoea	08	12.30
No symptom	35	53.84

***Multiple responses observed**

The distribution of systemic symptoms among research participants is displayed in Table 4. Roughly 50% of research subjects did not exhibit any systemic symptoms. Joint pain was the most prevalent systemic symptom, accounting for 29.23% of cases. Fever (18.46%), stomach discomfort (16.92%), diarrhoea (12.30%), and joint swelling (10.76%) were the next most common symptoms.

Table 5: Systemic symptom distribution among cases with varying clinical diagnoses

Clinical Diagnosis	Abdominal pain	Fever	Joint pain	Joint swelling	Diarrhoea	No symptom
CSVV	03	09	10	02	0	26
HSP	08	02	08	04	08	0
UV	0	01	0	0	0	07
C PAN	0	0	01	01	0	0
Nodular Vasculitis	0	0	0	0	0	01
AHEI	0	0	0	0	0	01

The distribution of different systemic symptoms based on the clinical diagnosis is displayed in Table 5. Clinical symptoms that patients with CSVV experienced were joint pain (10), fever (9), stomach ache (3), and joint swelling (2). Of the 26 individuals who were clinically diagnosed with CSVV, none systemic symptoms reported seen. Among patients with HSP, joint pain, stomach discomfort, and diarrhoea constituted the most prevalent systemic symptoms. The majority of individuals with UV diagnoses didn't exhibit any systemic symptoms at all.

Table 6: Distribution of the research participants' etiological variables, including different medicines

Etiological Factors (n=65)	Frequency	Percentage
Drugs	15	23.07
Infection	11	16.92
Connective Tissue disease	03	4.61
Idiopathic	36	55.38
Drugs(n=15)	**Frequency**	**Percentage**
Antibiotics	10	66.67%
NSAID	04	26.67%
Sulfasalazine	01	6.67%

The distribution of participants by etiological variables is displayed in Table 6. The most frequent etiological medicine was discovered to be antibiotics (67%), subsequently followed by NSAIDs (27%) and sulfasalazine (6%). The leading reason for illness was determined to be idiopathic (55.4%), accompanied by drugs (23.1%), infections (16.9%), and connective tissue diseases (4.6%).

Discussion

Due to its varied clinical appearance and correlation with a range of infections, connective tissue diseases, and cancers, our knowledge of cutaneous vasculitis is restricted. This study looks at cases of cutaneous vasculitis which were found by a variety of laboratory tests, clinical features, and medical history of the patient. The clinical diagnosis was supported by the skin biopsy results. We studied 65 people who had been given a diagnosis of cutaneous vasculitis. Utilizing laboratory results and histology, these individuals were assessed. The demographic profile of present study was consistent with previous research findings. [6,7] According to Khetan et al.'s study, the age group of 16 to 30 years old accounted for the greatest number of patients, followed by the age group from 31 to 45 years old. [8] In contrast, the majority of patients were found to be between the ages of 30 and 40, according to a research by Betty Alexander and colleagues. [7] In the current study, urticarial vasculitis affected 8 individuals (12.3%) while HSP affected 12 patients (18.5%). Acute hemorrhagic edema of infancy, nodular vasculitis, and cutaneous Polyarteritis Nodosa all occurred independently in one case (1.5%).

The remaining 42 patients, or 64.6% of the total, were diagnosed with cutaneous small vessel vasculitis. 37.7% of patients had hypersensitivity vasculitis (HSV), 26.2% had Henoch-Schonlein purpura, 6.5% had both urticarial vasculitis and connective tissue disease, and 1.6% each had microscopic polyangiitis, Wegener's granulomatosis, Polyarteritis Nodosa, and Takayasu's arteritis. These findings were reported by Khetan et al. [8]. It was determined that the remaining patients had unclassified vasculitis. The most common cutaneous symptom, found in 81.5% of the patients, was palpable purpura.

These results are consistent with other studies that revealed that in 86%, 70.5%, and 89.2% of the patients, palpable purpura was the most common manifestation. [8–10] According to our analysis, 12.3% of the patients had wheals, 9% had vesicles and bullae, 9% had ulcers, 6% had post-inflammatory hyperpigmentation, 4% had pustules, and 3% had nodules. According to Sais et al. [9], livedo reticularis, UV, pustules, ulcers, and nodules were seen in 20.3%, 16.5%, 10%, 8.2%, and 6.3% of patients, respectively. Forty-six percent of the cases had systemic involvement identified.

According to studies by Ekenstam et al. [11] and Gupta et al. [10], this equated to a similarity rate of 51% and 50%, respectively. In 29% of cases, the most common symptom was joint discomfort. The main joint impacted was the knee joint. Following this, there were signs of fever, nausea, and diarrhoea.

Conclusion:

It is clear from this study that cutaneous vasculitis is diverse. The severity of cutaneous vasculitis varies; it might be a benign, self-limiting ailment or a steadily worsening systemic disease. Blood arteries in any organ may be affected, resulting in a wide variety of signs and symptoms. The morbidity and fatality rates of this group of disorders can be significantly reduced by early detection and treatment.

The majority of individuals with cutaneous vasculitis had palpable purpura in addition to polymorphic lesions. Histological tests revealed that leukocytoclastic vasculitis was among the most common kind of vasculitis. Leukocytoclastic vasculitis was discovered via a skin biopsy, although there was no proof of systemic involvement. It is difficult to show that larger vessels are involved. For the majority of research subjects, the etiology of the illness remained unknown.

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