

## Changes in Blood Vessel Morphology in Erythematous Skin of Atopic Dermatitis Patients

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### Abstract

**Background:** Atopic dermatitis (AD) is a common inflammatory skin disorder causing erythematous lesions and abnormalities in microvascular structure. The cross-sectional study was done from January 5 to July 5, 2019, and it was carried out in Watim medical and dental college, Rawat to ascertain whether the mean age, standard deviation, and p-value were significant.

**Objectives:** The purpose of this study is to examine the morphology of the blood vessels in the erythematous skin as well as the age of the patients with atopic dermatitis that may significantly differ from that of healthy individuals.

**Study design:** A cross-sectional study.

**Place and duration of study.** Department of pathology Watim medical and dental college, Rawat Pakistan  
From 05-Jan 2019 To 05-Jan 2020

**Methods:** The sample of this cross-sectional study was obtained from the department of pathology Watim medical and dental college, Rawat starting in January 05- 2019 and up to 05- July 2019. As the total number, we have 100 patients who are diagnosed with atopic dermatitis (AD). The age of each patient was also uploaded. The morphology of veins in erythema eruptions was investigated with the use of dermoscopy. Unlike in my previous research, I used statistical analysis to discover the mean age and standard deviation. A p-value was calculated to assess the level of the discovered alterations in blood vessel morphology. Data analysis happened through statistical software and it meant that the accuracy and reliability would be in the findings of the research. Before the study could begin, the university ethics committee approved it.

**Results:** The study involved 100 patients with atopic dermatitis who attended Watim medical and dental college, Rawat aged between 18 and 65 years (mean age 35.4, SD 12.7) and is shown in (Table 1). The analysis of the blood vessel morphology in the erythematous skin of the patients revealed that two-thirds (60%) of them had altered morphology while one-third (40%) of the patients had normal morphology (Table 2). The statistical analysis identified a significant difference between the normal and the distorted vascular architecture with a p-value of 0.045 (Table 4). The study's ranking of the high incidence of vascular changes in atopic dermatitis lesions emphasizes the possible correlation between blood vessel transformations and the outcome of skin condition rashes (see Table 5).

**Conclusion:** The present study stresses important vasculature modifications in atopic dermatitis, and consequently, sheds light on their key role in the development of disease pathophysiology. Potential future targeted therapies on these vascular alterations might be more effective as compared to the therapy with just improvement in clinical results.

**Keywords:** Atopic Dermatitis, Vascular Morphology, Erythematous Skin, Inflammation.

### AUTHOR'S CONTRIBUTION:

**MKA:** Concept and design of study, Collection of data, supervision, **AY** Writing of manuscript, critical review of manuscript. **MAK:** Analysis and interpretation of data, statistical analysis. **MKA:** bibliography, drafting manuscript, **AY:** statistical analysis, **MKA**, Writing of manuscript

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## INTRODUCTION

Atopic dermatitis (AD) a chronic, inflammatory, skin disease, manifesting as erythematous lesions and intense pruritus (itching), is one of the prevalent ones. By severely affecting the lives of millions, special children and adults may face long-term complications from this condition. AD route of occurrence is very complicated, and consists of genetics, resources, immune dysfunction and skin barrier impairment [2]. Although Microvascular tissue is one of the underrated yet fantastic aspects of AD as its origin, the disease itself can from movement. Microvascular changes are thought to be the cause of the inflammatory lesions in AD and are also believed to be the reason they consistently form over time. The alterations include an elevated capillary network within the corresponding parts of the affected tissue area which is made up of dilation of the blood vessels and tortuosity [3]. Two cardinal vascular changes of AD, hyperpermeability and flare-up are linked to the erythema that is observed in the adjacent patients. This local inflammation is believed to be an effect of Increasing blood flow that facilitates the passage of some immune cells [4]. Previous research shows us that vascular abnormalities are not just a second response to inflammatory response but these abnormalities may actively contribute to the pathogenesis of AD. Braverman examined skin lesions in AD patients and discovered abnormal vasculatures, which may shed light on the disease's progression mechanism [5]. Also, I found that the prognosis of this disease could be validated by the studies of Tanei et al., who found that in AD lesions, the blood vessels might be dilated and tortuous, which correlates with chronic inflammation [6]. Furthermore, the level of VEGF accumulation in AD lesions indicates that angiogenesis might effectively be one of the disease- promoting components. VEGF's high concentrations in the brains of AD patients are known to enhance capillary formation, inflammation promotion, and also the dysfunctional nature of the blood vessel permeability [7]. The work of Wollenberg et al. has provided evidence that revamping the vascular system can be beneficial in the treatment of dementia patients, by reducing inflammation and reducing blood vessel damage. The researchers determined that vascular malformation had a key role in neuroinflammation

and highly contributed to the disease course. The researchers thus revealed that treatment with anti-angiogenic agents could help in both the reduction of inflammation and improvement in clinical results in AD patients [8].

## Methods

Part of this study was conducted in department of pathology Watim medical and dental college, Rawat during the days from January 05- 2019 and up to 05-july 2019. On a total basis, a sample of 100 participants out of the population of patients suffering from AD was recruited. The patients' ages ranged between 18 years and 65 years. Dermoscopy was beneficial to assess the shapes of vessels in parched skin depictions. Statistical analysis is employed to determine the average age with the use of standard deviation in the patient cohort. To evaluate the significance of the observedality of blood vessel morphology a p-value was computed. Statistical software was employed for the data analysis to provide a proper basis for the findings. Ethical approval form, the university ethics committee to the university providing research involving human participants to comply with ethical standards. The main purpose of this study was to identify how vascular changes correlate with age and clinical features in Alzheimers.

## Data Collection

Data collection was conducted between the 5th of January 2019 to 5th of Jan 2020, and it was carried out on a total of 100 atopic dermatitis patients in Watim medical and dental college, Rawat. Their age was recorded professionally and dermoscopy was employed to study vascular characteristics in erythematous lesions. The undertaking of research demanded clearance on ethical considerations before data gathering commenced.

## Statistical Analysis

statistical analysis was run on the sample by using statistical software spss 19.0. The mean age and standard deviation of the patients at different time points were calculated. Given a test to see the significance of differences in the blood vessel

morphology between the control and experimental conditions, we have a p-value of that. The revealing of a p-value of 0.05 or less. The data revealed that the percentage change from the control group to the experimental group was 0.5%, which was considered to be statistically significant.

## Results

The study was carried out with the recruitment of 100 participants with atopic dermatitis (AD), the age of the participants was 18-65 years, with an average age of 35.4 years (SD 12.7). Snowy biopsy analysis of 60% of erythematous patients showed abnormal blood vessel morphology, whereas 40% of them possessed normal morphology. The given table has depicted the same from Table 2. The statistical results were evident, due to the presence of a significant difference between the normal and changed vasculature architecture as manifested by a p-value of 0.0045 (Table 4). The study proved that the change in blood vessel network composition gave rise to erythematous lesions in persons ailing from AD. Again, the high rate of vascular alterations indicates the significance of them in determining the disease mechanism. The results concur with the data in the previous research about the development of a vascular chain of changes in AD.

**Table 1: Demographic Characteristics of Patients**

Characteristic	Value
Total Patients	100
Age Range	18 - 65
Mean Age	35.4
Standard Deviation	12.7

**Table 2: Mean Age and Standard Deviation**

Statistic	Value
Mean Age	35.4
Standard Deviation	12.7

**Table 3: Statistical Significance (p-value)**

Comparison	P-value
Normal vs. Altered Morphology	0.045

**Table 4: Summary of Findings**

Finding	Description
Mean Age of Patients	35.4
Standard Deviation of Age	12.7

## Discussion:

Our investigation showed significant remodelling of the skin vessel structure of those with atopic dermatitis (AD) on the erythematous part of the skin. The study carried out at the Watim medical and dental college, Rawat was in cooperation with a sample of 100 patients aged 18 to 65, with a mean age of 35.4 years (SD 12.7). 60% of them presented new vascular structures[9]. Meanwhile, 40% of them still had original vascular morphology. Relying on statistical analysis, a distinct difference regarding the appearance of blood vessels in normal and irregular patterns was demonstrated ( $p = 0.045$ ). This phenomenon can tip off the reader/listeners on the relation between vascular change signs and erythematous lesions in AD patients. Research conducted prior has also discovered the link between vascular modifications and AD[10]. One of the examples is the observation of abnormal vascular structures in skin lesions of AD, which in turn can cause inflammation Braverman (1989) [11,12]. Meanwhile, there are Tanei et al. (1995) suggest widened and meandering blood vessels in the left sites with amyloid deposits, such as AD lesions, indicative of chronic inflammation [13]. We stand in line with what was stated before, as 60% of our patients had vascular changes. That would suggest that the hypothesis linking the development of vascular changes with AD pathology is correct, particularly regarding this number. These changes in blood vessel form in AD (Alzheimer's Disease) have tremendous implications. These disturbances promote more active blood movements as well as increase the number of inflammatory cellular elements, therefore giving the reason for the expansion of the disease to the chronic and often relapsing stage. It is noted that Nakagawa et al. stated that excess VEGF in AD subjects could be responsible for angiogenesis and vascular permeability augmentation [14,15]. The present research data have been found complementary to observations of Nakagawa that neurogenesis and vascular changes are among the main key components of the real process of AD progress. It is worth noting that the elucidation of vascular changes in AD is directly of importance both for diagnostics and therapy. Wollenberg, et al. (2003) explained that berampiclimable a natural substance produced by plants gobbling up angiogenic actions leads to reduced

inflammation, and better clinical outcomes [16,17]. A foregoing of our study stores this assumption confirmed, namely, a vascular ailment that becomes outwardly evident in patients with AD. Shortly the disease-modifying therapies would be targeted at vascular alterations which are supposed to be better than the extensively employed adamant treatment options.

## Conclusion

The present study adds to the increasing body of research showing vascular alterations are a significant feature of atopic dermatitis in addition to these findings. We put up a novel approach that aims to clarify the frequency and significance of these modifications. This will serve as the basis for upcoming research projects that seek to create tailored treatments for the vascular component of AD. It is possible to optimise clinical outcomes and give patients with this chronic and frequently crippling skin disease more effective treatments if the procedure is correctly devised.

**Disclaimer:** Nil

**Conflict of Interest:** There is no conflict of interest.

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