



## DETERMINATION OF THE LEVEL OF VITAMIN D AND WHITE BLOOD CELL COUNT IN PATIENTS WITH ECZEMA

Huda Mohammad Kadhim Al-asady<sup>1</sup> and Azal A. Al-Rubaeae<sup>2</sup>

<sup>1</sup>MSc in Biology. Department of Medical Laboratory Techniques, Al Safwa University College

<sup>2</sup>Ph.D in Biology. Department of Medical Laboratory Techniques, Al Safwa University College

<sup>1</sup>[huda.mohammad@alsafwa.edu.iq](mailto:huda.mohammad@alsafwa.edu.iq) , <sup>2</sup>[azal.Alaa@alsafwa.edu.iq](mailto:azal.Alaa@alsafwa.edu.iq)

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### Abstract:

The cases of eczema have increased in recent times in societies and to study it, 40 blood samples were collected, distributed between 20 blood samples for people suffering from eczema and 20 blood samples from healthy people for comparison the results. In addition to recording information from eczema patients such as age and gender, and after diagnosis by the specialist doctor in the hospital, the samples were collected and the results were recorded to study of the influence of level the vitamin-D in patients, also the difference of the white blood cells number in patients compared to healthy people. This period is from 20/12/2019 to 1/3/2020 in Al-Zobair Hospital in Basra/Iraq. The ages of the patients ranged between 1-65 years. The study included about 11 samples, 55% for men, and 9 samples for women, 45%. The results showed that there was a non- significant decreasing ( $P > 0.05$ ) in concentration the vitamin D on patients with eczema, where it reached 12.15 ng / mL compared to healthy adults 25.5 ng / mL. And it was noted that the white blood cell numbers increasing significant ( $P < 0.05$ ) which about  $7.86 \times 10^9/L$  was recorded in patients compared to  $6.25 \times 10^9/L$  in healthy people.

**Keywords:** Eczema , Atopic dermatitis, Vitamin D, White Blood Cell.

### INTRODUCTION

Is a chronic or acute allergic skin disorder Eczema (Atopic dermatitis). and non-infections that occurs due to a problem in the skin cells in the epidermis where it becomes less intensity and disrupts the skin's natural functions, due to either internal or external factors such as genetic and immunological or physiological factors also the exposure of skin to certain substances or irritants like as chemical material and water, Thus it leads to the appearance of symptoms of eczema which includes redness, itching, blisters and scaling of the skin [1,2,3].

Eczema is a common disease all over the world and effects on all ages of both sexes, females are more susceptible to it, as well as being affected by the immune and psychological state and the level of some substances such as vitamin D. [4,5]. It affects many parts of the body, including the hand, arms, neck, face, and in extreme cases, it can extend to other parts of the body [6]. Recent genetic and pathophysiological studies of eczema indicated The genetic defect plays a vital function in the composition of epidermal cells, in addition to variation the immunity and surrounded factors for the occurrence of eczema [7].

Changes in modern lifestyles, along with increased indoor survival to protect from the sun, As humans obtain most vitamin D from skin synthesis by effect of sunlight, with less vitamin-D from dietary sources, this has resulted in decreased sun exposure to a lot of people , Which thus leads to vitamin-D insufficiency [8]. The immunity system, skin barrier function & vitamin-D are all involved in the development of eczema [9,10].

Although the effects of vitamin-D shortage in bone health are well understood, The impact of vitamin D status on other health outcomes has sparked heated debate in several fields of medicine, include dermatology and allergies, and Immunology as the Studies shown. As a result, the current study seeks to demonstrate the effect of immunological and physiological condition on eczema patients who consulted dermatology at Al-Zobair Hospital in Basra/Iraq by assessing white blood cell count and vitamin D level.

### MATERIALS AND METHODS

**Samples:** The study method include 20 patients suffering from eczema and 20 healthy as control with mean age of (1-65) from both sex. Collection a 5 mL of blood sample were drawn from the vein of the patients



under study by syringes and the total blood was divided into two parts, as 2 mL were placed in EDTA for the total count of white blood cells, and the rest of the blood was placed 3 ml in gel tube, then left The tube at room temperature for 15 minutes, and placed in a centrifuge for 10 minutes at a speed of 3000 rpm, to separate the serum that was drawn by a pipette and used to measure the vitamin D.

**Tests:** included the following tests :

**1: CBC test**

The full count of blood (CBC) factory by company Roby USA for total white blood cells.

**2: Quantitative Determination of Vit. D in Serum**

The level of vit. D by the company Roche-Germany ( using the technique by CobasE411 by flourecen).

**Statistical analysis of the data**

The data were performed using Microsoft Excel program in the computer where the mean value, standard deviation and statistical significance by P-

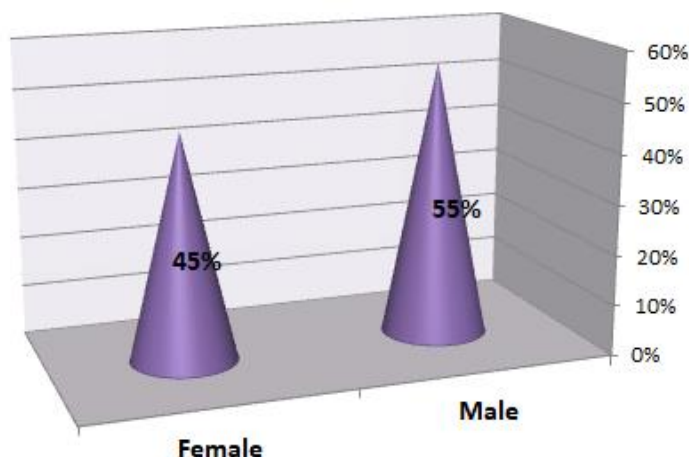
value at 0.05 probability level were calculated and the data were analyzed using anova analysis.

**RESULTS AND DISCUSSION**

During the period from 20/12/2019 to 1/3/2020, 40 blood samples were collected, distributed between about 20 blood samples from people suffering from chronic eczema and 20 samples from healthy people for comparison with the collection of data from patients such as age and gender. Where the ages of patients ranged between 1-65 years, and by based on the diagnosis of the doctor in the hospital in the case of eczema, samples were collected for laboratory tests, and the results were recorded to investigate the effect of the D vitamin level on patients, as well as to study the contrast in of white blood cells number compared to healthy people. Results were placed in a table and charts.

	Female	Male
<b>NO</b>	<b>9</b>	<b>11</b>
<b>%</b>	<b>45</b>	<b>55</b>

**Table (1):** Distribution of patients according to gender.



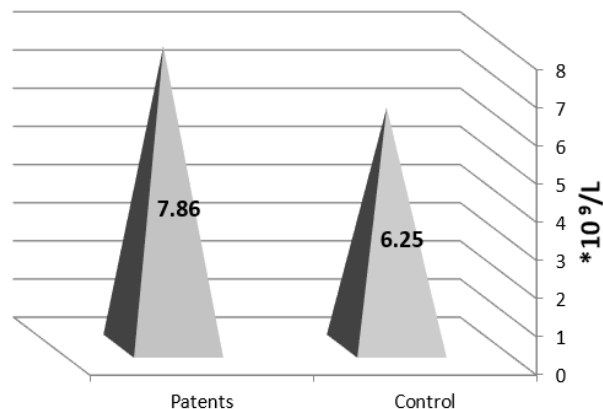
**Chart (1):** Distribution of patients according to gender.

In the present study note increasing the proportion of males 55% than females 45% that appear result in table (1) and chart (1), because of the nature of their hard work, this is agreed by most studies, such as study conducted in Karbala, the percentage of males reached 54.4% and female 45.6% [11]. Eczema is more frequent in women [4] than in men. Recent research,

however, has found a male majority at earlier ages [12]. Many Epidemiological studies from around the world, including one from Saudi Arabia, founding the women are more susceptible to eczema than men because women are more sensitive to health conditions [13,14,15].

WBCs	Patents ×10 <sup>9</sup> /L	Control ×10 <sup>9</sup> /L
Mean	7.86	6.25
SD	± 1.62	± 1.88
P-value	0.006	

**Table (2):** The count of total WBCs in eczema patient and control.



**Chart (2):** The count of total WBCs in eczema patient and control.

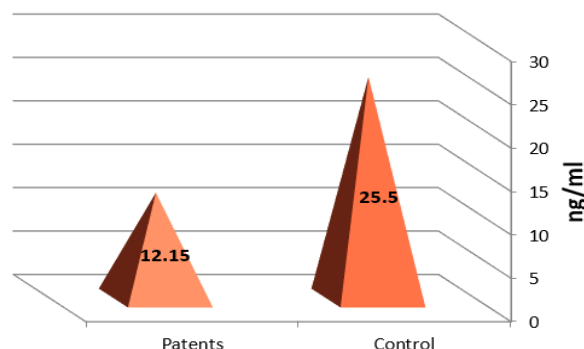
It is clear from the table (2) and chart (2) that there is an increase significantly ( $P < 0.05$ ) in the WBCs number in patients with eczema by ( $7.86 \times 10^9/L$ ) compared to healthy people ( $6.25 \times 10^9/L$ ) as the results of a study approach Jiang & Ma in 2017[16] of ( $8.49 \times 10^9/L$ ) while the control is ( $6.06 \times 10^9/L$ ). Eczema is an allergic inflammatory skin disease that is frequently linked to peripheral eosinophilia, serum IgE levels and the Total number of the peripheral blood cells [12,17,18,19].

Although genetic factors have a role in the development of the eczema, the disease is caused by particular immunological and inflammatory systems [16]. It is believed that the main cause of eczema is a

type of white blood cell called Th2 lymphocytes, usually produce cytokines in low quantities, in order to keep the body in a stable state, but in patients with eczema, these lymphocytes it activates, which causes an overproduction of cytokines, such as IL-22, which is one of the substances that affects skin disorders, such as skin thickness and abnormal differentiation, which ultimately weakens the skin barrier, so the effects of this cellular substance may be related with defects in the skin barrier and immunity in eczema. As a result, the underlying error causing atopic dermatitis lesions could be a minor loss in T cell regulatory function [19,20].

Vit. D	Patents (ng/ml)	Control (ng/ml)
Mean	12.15	25.5
SD	±3.98	±7.69
P-value	9.8	

**Table (3):** The level of vitamin D in eczema patient and control.



**Chart (3):** The level of vitamin D in eczema patient and control.



It is clear from the table (3) and the chart (3) that the levels of the vitamin-D decreased non-significantly ( $P > 0.05$ ) in eczema, where (12.15 ng/mL) was recorded compared to healthy people (25.5 ng/mL), as it converged with what was recorded Christina and *et al.*, (2018) [21] in his study where he reached (14 ng/mL) in eczema patients . There are some studies that can link between the taking a vitamin-D supplement with a reduced risk of developing eczema or clinical improvement of symptoms in eczema patients [22].

A skin is a site for making vitamin D in humans and Vitamin-D also impact of activity and skin functions , which include keratinocytes proliferation, differentiation and cell apoptosis to maintain the barrier and immune regulation processes this means that there are an association between the symptoms of eczema and changes in vitamin D levels [23].

Lower serum vitamin D concentrations have been linked to higher infection in children and adults, according to studies [24,25]. Eczema symptoms also increased with lower levels of vitamin-D ,according to the studies [24,26].

### CONCLUSIONS AND RECOMMENDATIONS

The conclusion from the current study is that the low level of vitamin D affected patients with eczema and its severity, as we note there are marked changes in the number of white blood cells. We recommend an extensive study of immunological and other physiological parameters, as well as a study of the effect of other factors in the environment, age groups and residential areas.

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