

# Correlation of Vitiligo Area Scoring Index with the amount of CXCL 10 serum in vitiligo patient

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## Abstract

**Introduction** Vitiligo is a skin pigmentation disorder, often progressive and familial, characterized by depigmented macules on asymptomatic skin. This disorder is an acquired idiopathic depigmentation disorder, characterized by scaly/ non-scaly white macules resulting from the loss of skin melanocytes. CXCL 10 is one of the 3 CXCR 3 receptor ligands which have chemotactic effects on various immune system cells. Serum CXCL 10 can be a new biomarker in monitoring disease activity.

**Methods** This is a descriptive cross-sectional study aimed at evaluating serum CXCL 10 levels in vitiligo patients conducted at Dr. Soetomo general hospital Surabaya, 16 blood samples of patients diagnosed with vitiligo were taken to patients to measure serum CXCL 10 levels.

**Results** Serum CXCL 10 levels in this study were higher in patients with stable vitiligo lesion activity and had high VASI values statistically,  $p = 0.000$  ( $p < 0.05$ ).

**Conclusion** There is positive correlation between VASI score and CXCL 10 serum levels.

## Key words

CXCL 10, Vitiligo.

## Introduction

Vitiligo is a skin pigmentation disorder, often progressive and familial, characterized by depigmented macules on asymptomatic skin. This disorder is an acquired idiopathic depigmentation disorder, characterized by a picture of a scaly/ non-scaly white macules resulting from the destruction of skin melanocytes. Vitiligo is an acquired disease with complex pathogenesis that is not well

understood so that the evolution of the disease is unpredictable and the outcome of therapy is often unsatisfactory.<sup>1,2</sup> Estimates of prevalence rates range from 0.1 to 2 percent in adults and children. Vitiligo can affect both men and women, without racial, ethnic or socio-economic predicates.<sup>1</sup>

Vitiligo is a multifactorial, polygenic disease, from many theories of disease pathogenesis, the most accepted is the interaction of genetic and nongenetic factors to affect the function and survival of melanocytes.<sup>1</sup> Some theories that reveal about the pathogenesis of vitiligo include genetic, autoimmune, neural, biochemical, oxidative stress and viral infections as mechanisms for destroying melanocytes.<sup>3</sup> CXCL 10 is one of the 3 CXCR 3 receptor ligands

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which have chemotactic effects on various immune system cells. CXCL 10 is secreted by various cells such as leukocytes, neutrophils, eosinophils, monocytes, epithelium, endothelium, fibroblasts and keratinocytes in response to IFN- $\gamma$  induction.<sup>4</sup> A recent study by Rashighi et al. reported that CXCL10 increased in serum and skin lesions of patients with vitiligo, and this was important for the development and maintenance of depigmentation in mouse models affected by vitiligo. This study is one of the pioneer studies in investigating the involvement of the chemokine pathway in vitiligo, and the authors' findings also highlighted CXCR3 and its ligands in the pathogenesis of vitiligo. However, to date, there has been little clinical data on this problem and little is known about the dynamic change or chemokine correlation with the severity of the disease.<sup>5</sup>

Wang et al. studied a population of non-segmental vitiligo patients with involvement of body surface > 5% compared to healthy patients. The study revealed that serum CXCL 10 increased significantly in patients with vitiligo and was higher in patients at progressive stages than in stable stages. The study also revealed that serum CXCL 10 levels in patients with progressive vitiligo were reduced after successful therapy. Serum CXCL 10 can be a new biomarker in monitoring disease activity and can be a guide for progressive treatment of vitiligo.<sup>3</sup> The role of chemokine CXCL 10 in vitiligo is still little known and studied. Research on CXCL 10 serum levels in vitiligo has never been done in Indonesia, especially in Surabaya. The results of this study are expected to obtain information and data regarding the profile of serum chemokine CXCL 10 in vitiligo patients.

## Materials and Methods

Sixteen blood samples of patients diagnosed

with vitiligo were taken to measure serum CXCL 10 levels. Informed consent was taken. The research was conducted from May 2018 until August 2018 at Outpatient Clinic, Dr. Soetomo general hospital Surabaya. Anamnesis is done to determine basic data and basic illness. After anamnesis evaluation and physical examination, blood serum samples will be taken for examination of serum CXCL 10 levels using the ELISA method.

## Results

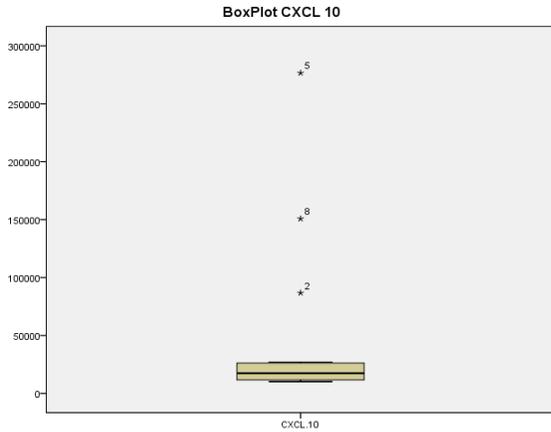
Normality test was done to know the distribution of data in this study. Shapiro-Wilk parameters were used because the total number of patients was less than 50. It is known that the sig value is 0.000 where <0.05, which means the CXCL 10 data is not normally distributed.

The serum CXCL 10 levels based on the highest VASI distribution was 44, which was 276,545 pg/ mL. It is known that the Sig value is 0.000 <0.05, which means there is a significant correlation between VASI and CXCL 10 with the direction and strength of the relationship of 0.976, which means there is a positive relationship between VASI and CXCL 10 with the strength of the relationship of 97.6%. A positive relationship means that if the VASI value is high then the CXCL 10 value is also high and vice versa.

**Table 1** Normality Test

	<i>Kolmogorov-Smirnov<sup>a</sup></i>		<i>Shapiro-Wilk</i>			
	<i>Statistic</i>	<i>df</i>	<i>Statistic</i>	<i>df</i>	<i>Sig.</i>	
CXCL10	0.414	16	0.000	0.552	16	0.000

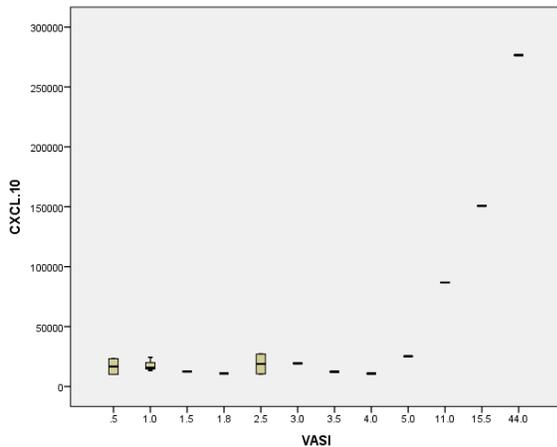
<sup>a</sup>. Lilliefors Significance Correction



**Table 2** Correlations

		<i>CXCL10</i>	<i>VASI</i>
<i>CXCL10</i>	Pearson Correlation	1	.976**
	Sig. (2-tailed)		.000
	N	16	16
<i>VASI</i>	Pearson Correlation	.976**	1
	Sig. (2-tailed)	.000	
	N	16	16

\*\* Correlation is significant at the 0.01 level (2-tailed)



**Discussion**

In this study, the results of examination of serum CXCL 10 levels in vitiligo patients ranged from 10,121 pg/ mL to 276,545 pg/ mL, with a mean of 45,570 pg/ mL and a median of 17,412 pg/ mL, from the Shapiro Wilk test finding a Sig value of 0,000 <0.05, which means CXCL 10 data is not normally distributed. From the BoxPlot image, where it is known from 16 data, 13 of them have a short data range while there

are 3 data showing data outliers that have extreme values compared to other data. In this study, the median level of patients with vitiligo was 17,412 pg/ mL. The serum CXCL 10 levels in this study were measured using the sandwich ELISA technique with kits from human CXCL 10 (Biolegend®). The minimum limit for detectable levels is 1.38 pg/ mL. Until now there is no literature that states the cut off value for serum CXCL 10 levels.

The average study of CXCL 10 serum levels based on the highest VASI distribution was 44, which was 276,545 pg/ mL. The Pearson test function is to show the correlation test to see the relationship between variables and in this case it was used to see the relationship of VASI with CXCL 10. It is stated that there is a correlation if the Sig value is <0.05. In this case the Sig value is 0.000 <0.05, which means there is a significant correlation between VASI and CXCL 10. A positive correlation means that if the VASI value is high then the CXCL 10 value is also high and vice versa.

**Conclusion**

Thus the serum CXCL 10 levels seen in this study were higher in patients with stable vitiligo with VASI values.

**References**

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