ORIGINAL ARTICLE

The Relationship Between Sunscreen Application and Severity Of Melasma

Intan Annisa Putri, Dian Ardiana*, Sihning E.J Tehupuring
Faculty of medicine, Hang Tuah University

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) Corresponding author:

dian.ardiana@hangtuah.ac.id

ABSTRACT

Melasma is commonly observed in community among women of reproductive age. Incidence of melasma at least nine times higher in women than men, especially in pregnant women. The relationship between sunscreen application and melasma in women of reproductive age has not been widely studied and the correlation is not clear. This study aims to determine the relationship between sunscreen use and severity of melasma in women of reproductive age. An analytical observational cross-sectional study was conducted among 31 women of productive age.

The results showed that 14 respondents had good sunscreen usage habit (45.2%), whereas 17 respondents had sun protector irregularly (54.8%). A total 27 respondents (74.2%) had mild melasma, whereas 3 respondents had moderate melasma (22.6%) and 1 respondent had severe melasma (3.2%). The Chi-Square test shows that the significance value (p) = 0.000 ($p < 0.05$) so that there is a significant relationship, meaning that there is a relationship between the use of sunscreen and severity of melasma in women of reproductive age.

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Introduction

Melasma, formerly known as chloasma, is the most common hyperpigmented of the skin, particularly on the face (Ogbechie-Godec & Elbuluk, 2017). It appears as mild to dark brown hyperpigmentation with symmetrical shape and irregular borders. The prevalence varies from 1.5% to 33% depends on the population (Huang *et al*., 2010 disitasi dalam Passeron & Picardo, 2018; Basit *et al.*, 2021).

Genetic factors, UV exposure and hormonal influence are the most common etiologic factors (Grimes, 1995 disitasi dalam Sarkar *et al*., 2020). Ultra violet radiation can trigger and worsen melasma because it was thought to activate nitric oxide induced by reactive oxygen species (ROS) (Ogbechie-Godec, O.A., & Elbuluk, 2017). Sun exposure shows an important role in the occurrence of UV radiation, which means that the higher sun exposure result in increasing severity of melasma (Ai, Young Lee, 2014 cited in Murniastuti, D.S. et al., 2020).

Various scoring systems have been proposed to evaluate the severity of melasma. The modified Melasma Area and Severity Index (mMASI) scores have the same validity and reliability as the Melasma Area and Severity Index (MASI) scores, one of the most popular and earliest scoring systems used (Abou-Taleb, D.A. et al, 2017 cited in Murniastuti, D.S. et al., 2020).

Treatment and prevention of melasma can begin with prevention of risk factors, protection against UV exposure and treating the lesions. Inhibition of the melanin synthesis pathway, decreased transfer of melanosomes to keratinocytes and accelerated removal of melanin are the therapeutic principles of melasma. Avoiding sun exposure is important for the improvement and prevention of melasma recurrence such as sunscreen application (Trivedi et al., 2017; Sarkar et al., 2018; Elcistia & Zulkarnain, 2019).

Sunscreen is a substance that helps reduce the amount of UV radiation by reflecting or absorbing harmful UV rays. Use sunscreen regularly can reduce the risk of skin cancer, premature aging, sunburn and other skin diseases caused by UV radiation (Xu et al., 2016). Broad-spectrum sunscreen (SPF 30) application was shown to reduce nevi in children in a 2000 study (Young et al., 2017). The incidence of melasma often occurs in Indonesia, because the majority of population has Fitzpatrick IV skin type (Suryaningsih et al., 2019). Based on the description above, authors are interested in conducting research on "The Relationship between Sunscreen Application and Severity of Melasma".

Methods

The analytic observational design was used because there was no intervention or treatment for variables in data or collecting information. The research method used is quantitative research or observation was obtained through identification of the size of variation in value. The data was obtained through a questionnaire to assess the habit of using sunscreen and severity of melasma. Data was collected according to the inclusion criteria with a simple random sampling technique.

Results

This research was conducted online involving 31 respondents who met the inclusion and exclusion criteria. All respondents involved were female with different age gaps.

1. Sunscreen Application

From table 1, it was found that 45.2% of respondents use sunscreen regularly and 54.8% were irregularly. So that some respondents have bad behavior in using sunscreen.

Table 1: Use of Sunscreen

Sunscreen Application	Number of Respondents (n)	Percentage (%)
Regular	**14**	**45,2**
Irregular	**17**	**54,8**
Total	**31**	**100**

2. The severity of melasma

Table 2 describes the number of respondents who have mild melasma 74.2%, moderate melasma 22.6%, and 3.2% have severe melasma.

Table 2: Severity of Melasma

Melasma Severity Degree	Number of Respondents (n)	Percentage (%)
Mild	**27**	**74,2**
Moderate	**3**	**22,6**
Severe	**1**	**3,2**
Total	**31**	**100**

Based on statistical tests in table 3, it is known that respondents who have good sunscreen usage habit have mild melasma 35.5%, moderate melasma 9,7%, and there are no respondents has severe melasma. Whereas, irregular sunblock influenced the severity of melasma. As many as 38.7% have mild melasma, moderate melasma 12.9%, and 3.2% have severe melasma.

Table 3: Cross-tabulation of sunscreen application with severity of melasma

			Melasma			Total
			Mild	Moderate	Severe	
Sunscreen Application	**Regular**	**Count**	**11**	**3**	**0**	**14**
		% of Total	**35,5 %**	**9,7 %**	**0 %**	**45,2 %**
	Irregular	**Count**	**12**	**4**	**1**	**17**
		% of Total	**38,7 %**	**12,9 %**	**3,2 %**	**54,8 %**
Total		**Count**	**23**	**7**	**1**	**31**
		% of Total	**74,2 %**	**22,6 %**	**3,2 %**	**100 %**

Based on the lambda test, it is known that the significance value is 0.000 (p value <0.05). Therefore, Ho is rejected and H1 is accepted. It can be concluded there are significant relationship between use of sunscreen and severity of Melasma.

Table 4: Data Analysis

value	Assymptomatic Standard Error[a]	Approximate T[b]	Approximate Significance
.438	**.092**	**3.915**	**.000**

Discussion:

Based on the statistical calculation, 54.8% of respondents have bad sunscreen usage habit, while 45.2% use sunscreen regularly. This can occur due to lack of knowledge how to use sunscreen properly and correctly. Sunscreen must re-apply every 2-4 hours in areas that are frequently exposed to the sun such as the face and neck and also leave the sunscreen at least

10 minutes before doing activities/exposed to UV rays.

Moreover, it was found that 74.2% respondents had mild melasma, 22.6% had moderate melasma, and 3.2% had severe melasma. The severity of disease can be influenced by internal and external factors. Internal factors that affect the severity of melasma such as genetic and hormonal factors, whereas external factors such as UV rays. Several factors may affect the severity melasma to tends to be mild such as not pregnant woman (hormonal factors) and lack in outdoor activities during the pandemic, which is an average of < 3 hours.

Chi Square test showed p = 0.001 (p value<0.05) which means that there is a relationship between the use of sunscreen and the severity of melasma in women of reproductive age. These results are supported by another study which showed that there was a relationship between the use of sunscreen and the severity of melasma (Putri, 2017).

External factors or internal factors may have their own role in influencing the severity of the respondent's melasma. This study took place during pandemic so respondents were often in their homes and rarely had contact with external factors that could increase the severity of melasma. Various internal factors such as genetic and hormonal factors can also affect the severity of melasma in each individual.

The results of this study are also in accordance with the theory which states that sunscreen can provide protection or prevention against melasma through protect the skin from UV rays by scattering and binding keratinocytes due to UV radiation (Seite and Park, 2013).

Compared with previous studies, smaller total number of respondents in this study might influence the results of the study to conclude the relationship between sunscreen use and the severity of melasma. Besides, in this study data collection was carried out online might reduce the level of specificity of the results due to diagnosis was made based on questionnaires and did not see the patient directly.

Thus, some of the above evidence can be used as a consideration about sunscreen application and severity of melasma is relevant and need for further studies on the variables related to the behavior of using sunscreen and severity level of melasma.

Conclusion:

Based on the results of research and data analysis, as well as the discussion that has been carried out, it can be concluded that all 31 respondents have melasma. Most of these respondents had mild melasma severity, as many as 27 respondents (74.2%) of 31 respondents. Some respondents were also stated to have bad behavior in using sunscreen, which was 54.8%. In addition, there was also a relationship between the use of sunscreen and the severity of melasma in women of reproductive age (p=0.001).

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Conflicts of Interest

There are no conflicts of interest declared by the author

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