

# To evaluate the protective effect of sunscreen in the incidence of melasma among medical students

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**Abstract** *Objective* The objective is to evaluate the protective effect of sunscreen usage in the occurrence of melasma among medical students.

*Methods* The study was conducted in the outpatient department of Dermatology at Punjab Rangers Teaching Hospital over a period of 6 weeks starting from August 2020 till mid of September 2020. A questionnaire was circulated among the medical students of Rahbar Medical & Dental College regarding the usage of sunscreen & occurrence of melasma.

*Results* Total 169 students responded ,93 (55%) females & 76 (45%) males. 104 (61.5%) students reported using sunscreen, 36 (36.6%) regularly (at least once daily) & 68 (65.3%) occasionally (once or twice a week), while the remaining 65 (38.4%) had never applied sunscreen. Based on sunscreen usage, the students were allocated groups, A & B respectively. Users were further subdivided into Regular users (A1) & Occasional users (A2). The incidence of melasma among 104 students in group A was 37 (35.5%) while the remaining 67 (64.4%) students did not claim any sort of hyperpigmentation on their face. On the other hand, out of 65 (38.4%) students of group B who had never applied sunscreen, 37 (56.9%) reported melasma while the remaining 28 (43%) did not.

*Conclusion* Regular application of sunscreen provides adequate sun protection to yield a shielding effect against photo pigmentation. On the contrary, occasional use does not confer much protection against the occurrence of melasma.

**Key words**

Melasma, sunscreen, medical students.

## Introduction

Melasma, a common chronic skin disorder clinically presents as symmetrical, hyperpigmented patches primarily on the cheek area of the face which is sometimes referred to as the mask of pregnancy, as it can be triggered due to increased hormones during pregnancy.<sup>1-3</sup>

It is not only relatable with pregnancy as women of any age group can be affected. According to many researches, most common cause of melasma is ultraviolet rays from extensive sun exposure. Melasma is thought to have a genetic component too as it tends to run in families.<sup>4</sup> It is a very common active complain in dermatology clinics and affects more than 5 million people in USA.<sup>3</sup> In South-East Asia the prevalence reaches 40% in women and 20% in men.<sup>5</sup>

The clinical pattern is defined by asymptomatic

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light to dark brown hyperpigmented area with symmetrical deposition and irregular borders. The condition gets worse during summers which is a hallmark of this disease. Early studies classified melasma in three categories; epidermal, dermal or mixed depending on Wood's lamp examination. Epidermal melasma is the most superficial one with increase of melanin in epidermis as compared to dermal kind with melanin deposition in the second deeper layer of the skin that is dermis. Although Wood's lamp examination remains the best tool to determine whether the pigmentation is settled in the epidermis (which should respond to topical depigmenting agents) or in the dermis, later studies using laser confocal microscopy have determined that all melasma are mixed, which suggested a common pathophysiology.<sup>6</sup>

Data published during the last decade has provided some interesting facts supporting the hypothesis that melasma is a photoaging disorder. Furthermore, advancement in histology has determined that melasma is a disorder not only limited to melanocytes, studies showing a marked solar elastosis. Solaris elastosis is a phenomenon in which there is an increase in mast cell count and sebaceous glands, altered basement membrane along with increased vascularization. These changes are considered as hallmark of photoaging skin.<sup>7</sup>

Despite many promising treatments available in the market with mixed results, melasma is still very hard to cure. Several methods of treatment are available to patients with melasma. First-line therapy always consists of topical compounds that alter the pigment production pathway and provide broad-spectrum photoprotection with sunscreen. Second-line therapy often consists of the additional chemical peels which are highly recommended. Laser and light therapy is a potentially promising option but also carry a significant risk of worsening the disease. A

detailed evaluation of the risks and benefits of various therapeutic options is crucial before starting the treatment.<sup>8</sup>

Use of sunscreen is a modifiable step in skin care regimen which helps reduce the risk of skin cancer, prevent sunburns, mitigate photoaging, and treat photosensitive dermatoses. Despite these benefits, use of sunscreen still remains persistently low in majority of population.<sup>9</sup> Unawareness of sunscreen is not only relatable to one problem but rather a multifactorial problem. In 2012, the market for sunscreens was expected to become a \$1 billion industry by 2016 with an expansive range of marketed sunscreen products.<sup>10</sup>

The rationale of the current study is to evaluate the prevalence of sunscreen usage in a medically aware part of our community, and to evaluate the preventive role of adequate sunscreen application in the development of photo pigmentation over the face, at the same time shedding some light on the contributory effect of photo damage leading to pigmentary changes on the skin.

## **Material and Method**

The study was conducted in Outpatient department of Dermatology at Punjab Rangers Teaching Hospital over a period of 6 weeks starting from August 2020 till mid of September 2020. A questionnaire was circulated among the medical students of Rahbar Medical & Dental College regarding the usage of sunscreen & occurrence of melasma. The results were interpreted to find the relevant association of the incidence of melasma with the prevalence of sunscreen usage. An informed consent was taken from the students along with filling of a questionnaire. Students were made sure that their identity would be kept hidden. Male & female medical student from first year to final

year were included in the study.

**Results**

Total 169 students responded, 93 (55%) females and 76 (45%) males. 104 (61.5%) students reported using sunscreen, 36 (34.6%) regularly (at least once daily) & 68 (65.9%) occasionally (once or twice a week), while the remaining 65 (38.4%) had never applied sunscreen. Based on sunscreen usage, the students were allocated groups, A & B respectively. Users were further subdivided into Regular users (A1) and Occasional users (A2).

The incidence of melasma among 104 students in group A was 37 (35.5%) while the remaining 67 (64.4%) students claimed that they don't have any sort of hyperpigmentation on their face. On the other hand, out of 65 (38.4%) students of group B who had never applied sunscreen, 37 (56.9%) reported melasma while the remaining 28 (43%) did not.

There was a significant difference in the incidence of melasma among the regular & occasional users. Among group A1 students, only 4 (11%) reported pigmentation on their face while the remaining 32 (88.8%) did not. However, the results of group A2 students were more or less similar with 48.5% (33 students) having melasma as compared to 35 (51.4%) subjects with no pigmentary complaints.

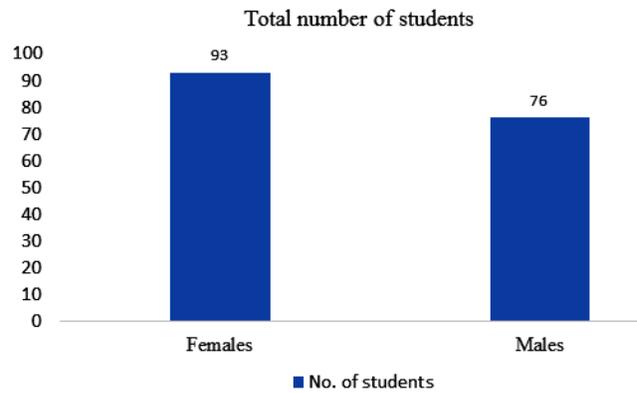


Figure 1 Number of students.

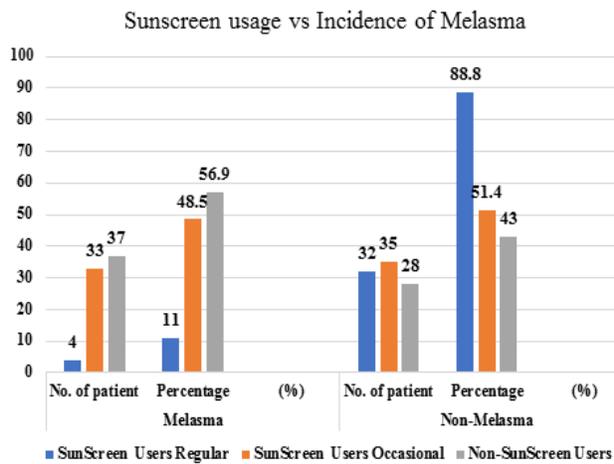


Figure 2 Sunscreen association to melasma

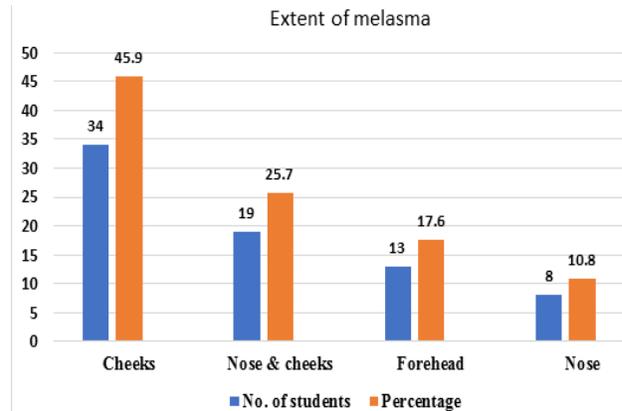


Figure 3 Area most affected by photo pigmentation

Table 1 Sunscreen association to melisma.

Disease/Users		Sunscreen Users		Non-Sunscreen Users	P value
		Regular	Occasional		
Melasma	No. of patient	4	33	37	0.018
	Percentage(%)	11	48.5	56.9	
No-Melasma	No. of patient	32	35	28	0.069
	Percentage (%)	88.8	51.4	43	
Total	No. of patient	36	68	65	
	Percentage (%)	21.3	40.2	38.5	

## Discussion

Melasma, a photo pigmentary disorder affecting people globally is a very common complain encountered at the dermatology clinics worldwide. The chronicity of this hyperpigmentation leaves a profound impact on the quality of life in these patients. In melanocompetent individuals, there is a greater incidence of hyperpigmentation due to increased melanin content and hyperresponsiveness of melanocytes to UV rays. But unfortunately, the due vitality of photoprotection has not been much emphasized upon in the past, however, evaluation of the present literature shows that sunscreen awareness is gaining its prime importance now. A relevant publications provided data supporting that a broad spectrum of protection including UVA, and visible light within sunscreen can play a vital role in therapy for melasma and PIH.<sup>11</sup>

Another similar study showed that importance of beginning sun protection at a younger age cannot be overstated and encouraging photo protection is currently the best method to prevent skin damage. Data showed that regular use of sunscreen has shown to reduce UV induced photosuppression and photosensitivities.<sup>12</sup>

A double-blind study comparing a broad-spectrum sunscreen use simultaneously with hydroquinone for treatment of melasma showed massive positive results as compared to use of hydroquinone alone.<sup>13</sup> In a six-month study of 40 patients, efficacy of UV-visible light sunscreen containing iron oxide was observed showing a significantly greater reduction in Melasma Area Severity Index (MASI) scores.<sup>14</sup>

The objective of the current study was to see the prevalence of sunscreen usage among a medically aware section of our community. The

observation that was made based on the results showed that a large percentage of medical students were not applying sunscreen on regular basis despite having adequate knowledge about the damaging effects of ultraviolet rays on the skin. This might be attributed to limited awareness about the protective role of sunscreen against photo pigmentation. Emphasis must be placed upon advocating the role of sun protection in preventing not only the pigmentation but also other major skin disorders and cutaneous malignancies. Its worthwhile to spread the word that extreme diligence is required in preventing the sun from aggravating melasma on the skin, which requires increased effort by dermatologists to educate & actively engage patients on sunscreen use.

## Conclusion

The current study concludes that only a few percentages of medical students were aware about the usefulness of sunscreen, while the remaining proportion was either unenlightened about its efficacy, or had underrated its shielding effect over the skin. Consequently, the incidence of melasma was reciprocally associated to the use of sunscreen among them.

Thus, it can be concluded that regular application of sunscreen provides adequate sun protection to yield a shielding effect against photo pigmentation. On the contrary, occasional use does not confer much protection against the occurrence of melasma.

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