

Photodermatosis and Photo protection in Metropolitan Traffic Police in Kathmandu city

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ABSTRACT

Background: Police officers are regarded as role model of discipline throughout the world. They serve a vital role in maintaining safety and harmony. During their duty, they are exposed to sun radiation which is non-intentional type sun exposure (NISE). The objective of our present study was to evaluate their knowledge and practice regarding ultra violet radiation, photo protection, sunscreens and sun-related photodermatosis.

Methodology: Traffic police officers, working at different locations in Kathmandu, were included in this cross sectional study. They were asked to fill the structured questionnaires and then interviewed and examined by dermatologist to assess their knowledge, behaviour and practice in relation to ultra violet radiation and photo-protection.

Result: Mean age of 265 respondents was 27.1 years. Respondent with graduation and post-graduation had knowledge and practice toward ultraviolet radiation, followed those with higher secondary education. Regarding the practice for photo protection, only 59.6% had knowledge about sunscreen, 39.6% had knowledge about ultraviolet radiation and 24.9% had knowledge about Ultra Violet Index. Similarly skin problems like melasma, premature wrinkles, and hardening of skin, polymorphic light eruption, burning foot syndrome, dermatophytes, and varicose vein were present.

Conclusion: Traffic police officers showed good practices in term of wearing hat, clothes that cover most of the body parts but poor practice over sunscreen, ultraviolet radiation and ultraviolet index. Lectures & seminar regarding the awareness and photo protection practice should be recommended.

Key words: Photodamage, Photo protection, Traffic Police, Ultraviolet Index, Ultraviolet radiation

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Introduction

Photodermatosis is a public health problem worldwide for last two decades and affects residents of geographic region where ultraviolet radiation has greater penetration.¹ Nepal is a developing Himalayan country located 28° North, 84° East in the Indian Sub-Continent¹, with Fitzpatrick skin type of IV and V. Skin problems are one of the common reason for people accessing health care service in Nepal.² Kathmandu, the capital city of Nepal

is located 1,425 metres above sea level. The higher the altitude, the more Ultraviolet Radiation (UVR) is exposed to earth surface.³ The acute harmful effects of ultra violet rays on the skin include damage of deoxyribose nucleic acid (DNA), apoptosis, erythema, immune suppression and increased pigmentation due to stimulation of melanogenesis. The long term effects of ultraviolet radiation on skin can lead to photo aging and photocarcinogenesis.⁴

There are two type of sun exposure: Intentional sun exposure and Non intentional sun exposure (NISE).⁵

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Intentional types are exposure in light skinned subjects spending most of their life indoor, but enjoying intense sun exposure during holidays exposing maximum body parts and often eager to acquire a sun tan. NISE represent sun exposure during daily life activities, without willingness to acquire a tan, most of them are field worker like farmer, gardener, traffic police, skiing, and worker at building construction sites⁵.

Police officer serve a vital role in maintaining safety and serve a role model for discipline throughout the world.⁶ Law enforcement officers suffer from numerous health problems including metabolic disorder, psychological disorder, chronic heart disease and cancer due to stressful life and threatening work, often they need to work in irregular hours lead to disruption of circadian rhythms. Circadian rhythm helps to maintain homeostasis in variety of physiological process, such as immune, endocrine, cardiovascular and autonomic nervous system.⁶

The use of a photo protector is an important and prime component in solar protection. Sunscreens were primarily designed for sunburn prevention and their ability to reduce UVR induced skin lesion.⁴

Nepal is developing country still struggling for basic life support due to low resource setting. Sunscreen and sun protection related behaviour and knowledge are still far beyond in the normal Nepalese and sun bathing is act as traditional medication during postpartum period, body ache, and in various traditional ceremonies. There is very few data regarding the photodermatitis, skin cancer, and knowledge and practice about sunscreen in general population in Nepal. The objective of our present study was to evaluate photo protection practice respect to UVR, sunscreens and sun related photodermatitis in traffic police.

Methodology

Traffic police officers, working at different locations in Kathmandu, were included in this cross sectional study. They were asked to fill the structured questionnaires and then interviewed and examined by dermatologist to assess their knowledge, behaviour and practice in relation to ultra violet radiation and photo-protection.

A cross sectional study was conducted in road traffic police officers from March 2016 to October 2016. The survey was carried out at different locations of Kathmandu among the traffic officers posted in outstation or in a field. Ethical approval was taken

from Institutional Review Committee of Kathmandu Medical College and from authority of traffic office police division at Ramshah path, Kathmandu. Data was collected from different police officers, who were assigned to field work on regular basis.

The questionnaires consisted of three parts.

First part consists of socio demographic characteristic.

Second part consists of questions regarding knowledge towards ultra violet radiation, Photo-protection practice (suntan, wearing hat and sunglass) and shedding in shade.

Third parts of questionnaires include cutaneous and other systemic problems.

Police officers with more than one year of duty in job and willing for interview were included in our study.

Statistical analysis was performed using the SPSS (Statistical Package for the Social Sciences) software program, version 15.

Result

Out of 265 police traffic participants, 128 (48.8%) were in age group of 18-25 years and mean age was 27.1 years. Males were 251(94.7%) and females were 14 (5.3%). 174(65.7%) were Brahmin by ethnicity followed by Chhetri 51(19.2%) .Moreover, 96(36.2%) of respondents had completed higher secondary level (intermediate/plus 2 level) followed by 84(31.7%) who had complete Secondary level (SLC). Head constable were 93(35.15%) followed by 84(31.75%) who were police constable (Table1).

Regarding the photo protection, only 59.6% had knowledge about sunscreen. Their common source of information regarding photoprotection was from friends (18.9 %), followed by doctor (17.7%), saloon/beauty parlour (10.6%), media (9.8%), and self (2.6%).

Only 34% officers were aware of importance of using sunscreen during working hours. Nineteen percentage believed that sunscreens was for mere cosmetic purpose, while 10.9% believed that sunscreens make skin soft and 15.8% had concept that sunscreen made skin glow and protect from sun rays.

All the officers wore hat as it was part of their uniform but only 27.5% used sunglasses during duty hour. All officers had to be non-intentionally sun exposure as they were not allowed to stay in shades during duty hours.

Regarding knowledge towards sunscreen, we found that female police officers had better knowledge about sunscreen comparing with their male counterpart (Table 2).

Table 1: Socio-Demographic Characteristics.

Gender:	
Males	251 (94.7%)
Females	14 (5.3%)
Age group:	
<25	128 (48.3%)
25-35	100 (37.7%)
35-45	22 (8.3%)
45-55	15 (5.7%)
Ethnic:	
Brahmin	174 (65.7%)
Chhetri	51 (19.2%)
Janajati	26 (9.8%)
Dalit	11 (4.2%)
Other	3 (1.1%)
Education:	
Secondary/SLC	84 (31.7%)
Intermediate	96 (36.2%)
Bachleor	36 (13.6%)
Master	49 (18.5%)
Service duration:	
0-2 year	61 (23.0 %)
3-4 years	101 (38.1%)
5-6years	61 (23.0%)
>6years	42 (15.8%)
Job position:	
Police constable	84 (31.75%)
Head constable	93 (35.15%)
Asst-Sub Inspector	32 (12.1%)
Sub Inspector	38 (14.8%)
Inspector	18 (6.8%)

Table 2: Knowledge of sunscreen among Gender

GENDER	SUNSCREEN MANDATORY TO APPLY	
	NO	YES
MALE	169 (67.3%)	82 (32.7%)
FEMALE	6 (42.9%)	8 (57.1%)

Chi- square-3.541, p- 0.060

Table 4: Knowledge of UVR and UVI with Education Level

Education level	Ultra Violet Radiation		Ultra Violet Index	
	NO	YES	NO	YES
SLC pass	88.1%	11.9%	84.5%	15.5%
Intermediate	77.1%	22.9%	93.8%	6.2%
Bachelor	33.3%	66.7%	86.1%	13.9%
Master	0	100.0%	14.3%	85.7%
Chi square-123.848, p- <0.000		Chi square-121.071 , p- <0.000		

Regarding sunscreen, officer with age group of 25 -35 years had more knowledge about importance of sunscreen during duty hours followed by age group of 18-25 years. There was significant difference in practice of sunscreen by age group since P value less than 0.001. Younger age groups are more updated about sunscreen compared with older age groups (Table 3).

Table 3: Knowledge of sunscreen with age group

AGE (years)	SUNSCREEN MANDATORY TO APPLY	
	NO	YES
18- 25	105 (82%)	23 (18.0%)
25-35	44 (44.0%)	56 (56.0%)
35-45	15 (68.2%)	7 (31.8%)
45-55	11 (73.3%)	4 (26.7%)
Total	175 (66.0%)	90 (34.0%)

Chi- square-36.654, P-<0.001

Almost 39.6% had knowledge regarding Ultraviolet Radiation (UVR), similarly 24.9% had knowledge about Ultra Violet Index (UVI). Knowledge regarding UVR and UVI was related to their educational status as shown in Table 4.

On cutaneous examination, most of traffic police had multiple sun related photo dermatosis like melasma 65 (24.5%), premature wrinkles 49 (18.6%) , thickening of skin 46 (17.4%), polymorphic light eruption 43 (16.2%), actinic prurigo 33 (12.5%), heat urticaria 48 (18.1%), freckles 47 (17.7%). Apart from photodamage 169 (63.8%) had burning foot syndrome, atrophic pits 25 (9.4%) , alter texture 14(5.7%) , acne 15(9.8%). (Table: 5)

Dermatophytes was present in 133(50.1%), among these tinea corporis was present in 19.2%, tinea cruris (17.4). tinea pedis (13.6%).

Table: 5 Skin Diseases in Traffic Police Officer

SKIN DISEASE	TRAFFIC POLICE OFFICER
	Percentage
Melasma	65 (24.5%)
Premature Wrinkles	49 (18.6%)
Harding of skin	46 (17.4%)
Polymorphic light eruption	43 (16.2%)
Acquired Melanocytic Nevi	35 (13.2%)
Actinic prurigo	33 (12.5%)
Heat urticaria	48 (18.1%)
Freckles	47 (17.7%)
Atrophic pits	25 (9.4%)
Alter texture	14 (5.7%)
Acne	15 (9.8%)
Burning foot syndrome	169 (63.8 %)
Dermatophytes	133 (50.1%)
Varicose vein	96 (36.2%)

Varicose vein was present in 96 (36.2%) officers, among them thirty -two officers had more than 6 year in experience in field follow by 25 officers with 3 to 4 years. History of allergic rhinitis was present in 36(13.6 %) and recurrent respiratory track infection (RTI) was reported in 88 (33.2%). Similarly 83 (31.3%) officers had history of lips problem among them chapped lip and angular cheilitis were present in 12(4.5%) and 31 (11.7%) respectively.

Discussion

Occupational health hazards are injuries or illness or disease, result from a particular employment, mostly from the effects of long term exposure to specific substance or of continuous or repetitive physical acts.⁷ Police officers usually live under constant apprehension of physical pressure, work long, irregular hours, and are exposed to ultraviolet radiation, resulting in photodamage, pre cancerous and cancerous condition along with systemic illness. Dermatitis related to sun exposure is one of the many occupational hazards that police officers face.

UVI is a tool measure the intensity of solar UV rays. The unit of the UVI index is equal to 0.9 SED/ hr (Standard Erythemal Dose) and the UV index value range between 1(very low) and 10 (very high) & extreme 11+ values.⁸ UVI helps to assess the chance of getting photo damage and related dermatosis. UVI has gaining importance in developed world for the last few decades. It included in many of their weather

forecasts, but we Nepalese are still unaware about this index and its importance in our daily life.

Nepal is a Himalaya country with higher altitude level. Through out the year Ultra violet index is high, during summer UV index is 9-11, during winter UVI is 3-6, and even higher during a clear sky day in monsoon season.⁹

In our study, female and younger age officer groups well aware on the practice of skin care. Several studies found that the younger generation is more insistent in taking protective behaviour compared to the older generation while the studies done by Campbell (1994)¹⁰ and Kristjansson (2004)¹¹ showed opposite results. In our study male officers were higher in number in respect with female officers, though employment of female police officer in police department are gradually increasing since last 5-6 years after termination of civil war in Nepal.

The use of photo protection found in the present study varied in accordance with the patient's education level. In our study, police officer with Bachelor 36 (13.6%) and Master level 49(18.5%) had knowledge about UVR and UVI.

Only 35.6% officer had knowledge about ultraviolet radiation (UVR) as a type of sun ray and only 24.9 % had knowledge about ultraviolet index (UVI). 34.0% of the respondents were aware about the importance of routine application of sunscreen during working hours.

Clinical trial carried by Thompson et al¹² and Naylor et al¹³ found that sunscreen is effective in reducing the incidence of precursor to squamous cell carcinoma. Vaino and Bianahini found that most of the respondent use sunscreen only when they intend to stay out in sun, without using other sun protection like cap, glasses and shades.¹⁴ 59.6% had knowledge about sunscreen and its importance in photo protection. The most common source of information about sunscreen was from friends in 18.9%, followed by doctors (17.7 %), saloon (10.6%), media (9.8%) and self (2.6%). Only 16.9% of Malaysian traffic police officer had knowledge about sunscreen.¹⁵

Regarding sunglass, only 27.5 % of police officer with ranking of Inspector & Sub-inspector wore sunglass. In study done in Malaysia traffic police officer only 84.6% wore hat, 68.9% wore sunglasses and 85.65% wore cloth covering the most of body part.¹⁵ Similarly, Saridi et al. reported only 50% wore hat and stayed in

shade.¹⁶ In our context, staying in shade is not possible as they were posted in field for traffic control. Several studies showed lower practice of photo protection with compared to our study. Kaymak et al. (2007)¹⁷ and Harkter and Yezici (2008)¹⁸ found that not going out a peak times is the most commonly adopted method of avoiding the harmful effects of sun, which is not implemented here.

Stressful and irregular working hours can lead to the disruption of circadian rhythm and also increase in consumption of alcohol and smoking to cope with these stress⁶. In our study, consumption of alcohol was found in 28.8%, smoking (22.1%). Diabetes mellitus was seen in (25.1%), hypertension in (11.4%) and Thyroid disorders in (15.1%).

In Nepal, skin disease is one of the most common causes for medical consultation.¹⁹ In a study, done in hilly region of Nepal, eczema, pigmentary disorder, acne, urticaria, moles and lump were most common skin disease,²⁰ where as in our study, we found melasma, photodamage change along with dermatophytes, varicose vein and burning foot syndrome were most.

UVR exposure is known suppressor of cutaneous cell mediated immunity in human. It can lead to skin aging process as well as development of photodermatosis and skin malignancies.

In our study, most common photodermatosis was melasma 65 (24.5%) followed by thickening of skin 46 (17.4%) and premature wrinkle 49(18.6%). Eczematous polymorphic light eruptions was 43(16.2%) and acquired melanocytic nevus was seen in 35(13.2%) after joining the police service. Similarly pigmentation, freckles, melasma also aggravated after joining in service. Actinin prurigo & heat urticaria was also present in our officers.

The present study has several limitations. First, only traffic police officers in field were studied as there were many branches of Nepal police who works regularly in the field. Second, only questioner & clinical evaluation (inspection) was done, as other measures like skin biopsy, Dermatoscope was not used for definitive diagnosis of skin lesion.

Conclusion

It has been suggested that around 80% of skin cancer and photodermatosis cases are preventable with the implementation of sun protection measures and appropriate behaviour. In police job, every-one have to wear hats and proper clothing including full sleeves covering most of the body parts in all season. This in itself help act as photo protector in all seasons. According to Nepal government, all the police officers have to wear proper police uniform with thick and long sleeves shirt and dark thick blue trouser with short brim cap during duty hour.

The practice of sun protection among the traffic police officers showed good in term of wearing hat and clothes that covers most of the body. However, the study revealed a poor practice and knowledge about sunscreen, UVR and importance of UVI in photo protection.

Health education sessions and awareness lectures should be recommended to all traffic police officers on sun protection behaviours.

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