

UVR PROTECTION IN SHANGHAI

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Presented at the cosmoprof Asia, Hong Kong, 12 Novembre, 99

Received: November 99,

Key words: Ultraviolet, Sunscreens, Epidemiology.

Summary

The highest means UVR irradiate value at noon is observed in July (UV-420, 7325 $\mu\text{W}/\text{cm}^2$; UV-365, 3317 $\mu\text{W}/\text{cm}^2$) or August (UV-297, 34.7 $\mu\text{W}/\text{cm}^2$) at Shanghai. The trend showed that radiation power of summer > that of autumn > that of spring > that of winter. The highest means UVR of a day appeared around noon. The UVA is nearly 100 times higher than UVB.

There are more than 315 brands of sunscreens in China to date. The quantities of sunscreens in China are increasing every year and the quality of sunscreens is also improved greatly. The most of commercial available sunscreens are broadband. The largest producing area is Shanghai. More and more Chinese people are using the sunscreens every day.

Though majority of students realized the harmful effects of UVR, a lot of them neglected to protect themselves from exposure to UVR. In summer outdoor activities, 16.4% of students applied sunscreens every day, 20.3% used sunscreens between times, 66.3% did not use any sunscreens. 61% female think it is necessary to use sunscreens regularly, but only 23% male agree with that. It is urgent to take some propaganda against UVR in China.

Riassunto

A Shanghai la maggior intensità dei raggi solari si registra a mezzogiorno nei mesi di luglio (UV-420, 7425 (W/cm²; UV-363, 3317 (W/cm²) o di agosto (UV-297, 34.7 (W/cm²). In queste ore gli UVA sono circa 100 volte di più degli UVB. L'intensità radiante diminuisce passando dall'estate all'autunno, alla primavera ed all'inverno.

Oggi in Cina sono presenti circa 100 marchi diversi di prodotti solari. Sia la quantità venduta che la qualità aumenta di molto ogni anno e la maggior parte dei protettivi solari commercializzati sono ad ampio spettro e prodotti principalmente nell'area di Shanghai. Numerosi sono i cinesi che usano i filtri solari ogni giorno e pur essendo noti i danni provocati dal sole. Questo problema viene sottovalutato dagli studenti. Infatti soltanto il 16% degli studenti utilizzano regolarmente prodotti solari, ma solo il 20.3% li utilizzano saltuariamente ed il 66,3% non li usano. Il 61% delle donne pensano che è necessario utilizzarli ma solo il 23% li usa abitualmente.

È necessario, quindi, incrementare i messaggi sull'uso di questi prodotti.

The level of living in China has been improved greatly since Chinese opening door policy was executed in 1978. Not only do Chinese satisfy with the common daily life, but also we want to be looked younger and more active, especially the women hope themselves more beautiful and attractive. The most of Chinese become more and more interested in nutrition, exercise and anti-aging. There are more and more commercial available cosmetics in China. In this paper, we mainly discussed the sunscreens and UVR protection at Shanghai.

SOLAR UVR MEASUREMENTS IN SHANGHAI

The sun is the main source of ultraviolet radiation (UVR). The stratospheric ozone layer prevents almost all UVR of wavelengths less than 290 nm and a substantial proportion (70%-90%) of UVB radiation from reaching the earth. Recent public and scientific concern about ozone depletion and increased UVR have lead to the establishment of many UVR monitoring centers in the last few years. Measurements of solar UVR have been made worldwide for many years. Generally, however, these measurements have not been coordinated and provide only a limited database for assessing personal exposure to solar UVR at ground level [1]. There are few UVR measurement reports in China to date. We started to measure ground-level solar UVR in Shanghai area in 1995 and carry it on to now.

We use the broadband radiometer of UV-A and UV-B (Light and Electric Instruments Factory of Beijing Normal School). UV radiation was measured in sunny days, from AM 9.00 to PM 3.00, sometimes from AM 7.00 to PM 7.00, total three days in a month. One day is among the first ten days of a month, another day is among the middle ten days of a month and the third day is among the last ten days of a month. There are no any reflective objects or shadow around monitoring point.

The highest means UVR irradiate value at noon is observed in July (UV-420, 7325 ($\mu\text{W} / \text{cm}^2$); UV-365, 3317 ($\mu\text{W} / \text{cm}^2$) or August (UV-297, 34.7 ($\mu\text{W} / \text{cm}^2$) at Shanghai. The trend showed that radiation power of summer > that of autumn > that of spring > that of winter. The highest means UVR of a day appeared around noon. The UVA is nearly 100 times higher than UVB.

It is a very important work to monitor the ground level UVR, especially for a long time. It can be to provide information to the public on UVR levels and variations and to establish a basic UVR climatology. It can also study cause and effects of UVR transmission and detect long term variability [2]. We cooperated with Shanghai Meteorology Association to set up an automatic monitor station in 1997 and forecast the UV index by TV, radio, newspaper and Internet.

SUNSCREENS IN CHINA

In history, the life style of Shanghais was influenced heavily by western culture. The Shanghai people are eager to know the new things and the fashion in the world. There were not more than 10 types of commercial available cosmetics before 1978 and most of them were produced at Shanghai. At that time, the Shangbais cosmetics were famous in China. After the Chinese opening door policy was executed in 1978, the production of cosmetics increased year by year.

The first commercial available sunscreens appeared at Shanghai in 1980, which was imported from Europe. Since then, more and more sunscreens were imported. The first sunscreen made in China launched in 1990 and then the increases of new brand is almost 100% each year (Table 1). The proportion of sunscreens in special cosmetic also increases very rapidly (Table 2).

Table 1 Net Increase of Sunscreen Each Year

Year	Sunscreen	Percent
1991	10	3.2
1992	19	6.0
1993	11	3.5
1994	32	10.2
1995	67	21.3
1996	97	30.8
1997	79	25.0
Total	315	100

Table 2 Proportion of Sunscreens in Special Cosmetics

Year	Special Cosmetics	Sunscreens	Percent
1991	132	10	7.6
1992	252	29	11.5
1993	319	40	12.5
1994	425	72	17.0
1995	563	139	24.7
1996	798	236	29.6
1997	1004	310	30.9

There are several types of formulation of sunscreens in China (Table 3). The most of sunscreens are cream and lotion.

The producing areas of sunscreens in China are

listed at table 4. The largest producing area is Shanghai. The second is Guangdong. The third is Beijing.

The quantities of sunscreens in China are in-

Table 3 Types of Sunscreens

Type	Sunscreens	Percent
Cream	134	42.5
Lotion	117	37.1
Liquid	33	10.5
Cake	18	5.7
Oil	8	2.5
Lip Stick	4	1.3
Shampoo	1	0.3
Total	315	100

Table 4 Production Area of Sunscreens

City/Province	Sunscreens	Percent
Shanghai	102	32.4
Guangdong	99	31.4
Beijing	31	9.8
Zhejiang	23	7.3
Jiangsu	22	7.0
Tianjin	13	4.1
Sichuan	5	1.6
Liaoning	4	1.3
Fujian	3	1.0
Hunan	3	1.0
Hainan	2	0.6
Others	8	2.5
Total	315	100

creasing every year and the quality of sunscreens is also improved greatly. The most of commercial available sunscreens are broadband, not only protect the UVB, but also protect the UVA [3]. More and more Chinese people are using the sunscreens every day.

Epidemiological Studies of Sun Protection in Undergraduates

Sun exposure and sunburn, particularly in childhood, are important risk factors for skin cancer. In order to find out whether the students are aware of the harmful effects of UVR and whether they know how to protect themselves from UVR. We carried out a series of investigation in undergraduates. In Chinese university, the new students must take part in one month (September) military exercises before their classroom studies. Using these opportunities, we investigated the new students from 1996 to 1998 and the total students were 1058 in all together. We used the questionnaires to obtain the general

conditions, history of sunburn, diseases associated with sunlight, the awareness of UVR harmful effects and how to protect oneself from UVR [4].

Of 1058 students, male is 518 (49%) and female is 540 (51%) respectively, averages of age is 18.8 years old, range from 16 to 21 years old, 14 (1.3%) had light allergic, 112 (10.6%) had sunburn. 92.6% people are aware of UVR harmful effects. 75.8% consider that UVR can lead to skin aging, 95.2% agree with that UVR is risk factor of skin cancer. But only 37.8% take care of themselves away from UVR. 89.6% know about sunscreens, but only 24.4% understand the meaning of SPF. In summer outdoor activities, 16.4% of people applied sunscreens every day, 20.3% used sunscreens between times, 66.3% did not use any sunscreens. In military exercises, 21.4% of people applied sunscreens every day, 36.7% used sunscreens between times, 41.9% did not use anything. There is a significant difference between the male and female on the using of sunscreens. 61% female think it is necessary to use sunscreens regularly, but only 23% male agree with that.

The investigation shows that though majority of people realized the harmful effects of UVR, a lot of them neglected to protect themselves from exposure to UVR. The result was similar to that

of early investigation in western country. It is urgent to take some propaganda against UVR in China.

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