

Sun-related Behaviour in Individuals with Dysplastic Naevus Syndrome

YVONNE BRANDBERG¹, RAGNAR JONELL², MATS BROBERG³, PER-OLOW SJÖDÉN⁴ and INGER ROSDAHL⁵

Departments of Oncology, ¹Karolinska Hospital and ³Danderyd's Hospital, Stockholm and Departments of Dermatology, ⁵University Hospital, Linköping and ²Sahlgren's Hospital, Göteborg and ⁴Centre for Caring Sciences, Uppsala University, Uppsala, Sweden

In Sweden, individuals with dysplastic naevus syndrome are regularly screened and informed about self-examination and sun-protection at special clinics. This study describes sun-related behaviour in this group.

A total of 54/65 consecutive patients with dysplastic naevus syndrome (28 women and 26 men) completed diary recordings of sun-related behaviour during 1 month in 1994.

A majority (81%) reported sunbathing with the intention to get a tan, mean number of occasions 9.2, range 1–24 occasions, during the month of recordings. Out of these, 61% reported sunburns, some of them repeatedly up to 7 times. Sunbathing occurred mainly in bathing suits during midday in sunny weather, with a mean duration of 2.5 h per occasion.

Such a hazardous behaviour in the sun in a melanoma high risk group is alarming. New models for intervention to support a more sun protective life style in this group of patient have to be elaborated. Key words: diary; sunburns; malignant melanoma; information.

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Y. Brandberg, Department of Oncology, Karolinska Hospital, S-171 76 Stockholm, Sweden.

A number of risk factors related to sun-exposure have been identified for malignant melanoma, such as fair complexion, intermittent sun-exposure and severe sunburns, especially during childhood (1, 2). Preventive campaigns have been launched in many European countries, aiming at an increased awareness of the harmful effects of exposure to the sun and at supporting a sun protective life style (3). Although attended to and understood, general information to alter sun-seeking behaviour seems to have very little influence on such behaviour (4–6). Apparently, the association between perceived risk of a disease and preventive behaviour is complex.

Dysplastic naevi are considered to be cutaneous markers, identifying individuals with an increased risk of developing melanoma (7). Individuals with dysplastic naevi and two or more family members with melanoma (dysplastic naevus syndrome type D2, DNS-D2) have an almost 100% life-time risk of developing melanoma if pre-malignant lesions are not removed (8). Since 1987, special pigmented lesion clinics have been implemented throughout Sweden to identify and regularly screen individuals with this syndrome (9).

The aim of the present study was to describe sun-related behaviour in individuals with dysplastic naevus syndrome.

MATERIALS AND METHODS

Procedure

Up to September 1994, 190 Swedish families with DNS-D2 were identified. Individuals with dysplastic naevi in those families are regularly examined by a

dermatologist or an oncologist. Individualised information about self-examination of the skin and sun-protection is given by a specially trained nurse or by the examining physician at least twice a year.

The study was carried out at two DNS clinics, the Department of Dermatology, Sahlgren's Hospital, Gothenburg and at the Department of General Oncology, Karolinska Hospital, Stockholm. A total of 65 consecutive patients with DNS, 24 in Gothenburg and 41 in Stockholm, visiting these clinics in May 1994, were asked to participate by a nurse at a regular follow-up visit after the skin examination. Eleven patients (17%) were not able to take part because of lack of time or travelling abroad. A total of 54 patients were included in the study.

After having given their consent, the patients were given three envelopes and a diary, consisting of a set of 31 sheets for daily recording of sun-related behaviour. Both oral and written instructions were given about how to fill out the diary. The patients were instructed to complete one sheet each day during 1 month (June or July 1994). The sheets were returned by mail in sets of ten on three different occasions during the month of registration. This procedure was used to prevent the patient from completing the whole set on one occasion. With this procedure, the patient did not have access to recordings from previous weeks when recording later weeks. Postcards were sent as reminders to each patient the week prior to the start of the registration.

A total of 20/24 patients from Gothenburg and 34/41 patients from Stockholm completed the diary. Of these, 28 (52%) were women and 26 (48%) were men. Mean age was 33 years (range 16–63), 31 years for women and 35 years for men. There was no statistically significant age difference (*t*-test) between patients from Gothenburg and Stockholm.

Instrument

A structured diary consisting of a sheet for daily registration of sun-related behaviour had been developed by dermatologists, oncologists and psychologists in collaboration. The sheet consisted of two parts (Fig. 1).

Part I of the diary sheet was designed to capture detailed information about sunbathing. Part II was included in order to differentiate between sunbathing and other outdoor activities. As the social pressure to have a tan during the summer is strong, we suspected that sunbeds were used when the weather was bad or among individuals who easily got sunburnt. Therefore, the item "Have you used a sun-bed today?" ("Yes"/"No") was included.

RESULTS

Sunbathing and outdoor stay

A total of 44 patients (81%) reported having sunbathed with the intention to get a tan at least once (one day) during the month of recordings. There was no statistically significant difference (χ^2) between the clinics in the proportion of patients who sunbathed, 16 patients from Gothenburg (80%) and 28 from Stockholm (82%). Two women and 8 men did not sunbathe at all. There was a higher proportion of women (59%) as compared to men (41%) among those who sunbathed ($\chi^2=4.99$, $df=1$, $p<0.05$).

The mean number of occasions of sunbathing among those who sunbathed ($n=44$) was 9.2 (median=6), ranging from 1 to 24 occasions during 1 month. The mean duration per occasion was approximately 2.5 h.




Women reported a higher number of occasions than did men, but there was no gender difference in mean duration of sun-exposure per occasion (Table I). Neither was there any age difference between those who sunbathed and those who did not (*t*-test). There was no difference in the mean number of occasions of outdoor stay or the mean duration of outdoor

SUN DIARY




Name: _____ Date: _____

Place of stay: _____

SUNBATHING (WITH THE INTENTION TO GET A TAN)

Have you been sunbathing outdoors today?	Yes <input type="checkbox"/>	No <input type="checkbox"/>
For how long time? _____ hours		
At what hours?	9- 11 am <input type="checkbox"/>	1-3 pm <input type="checkbox"/>
	11-13 am <input type="checkbox"/>	3-5 pm <input type="checkbox"/>
How were you dressed?	Fully <input type="checkbox"/>	Shorts and skirt short sleeves <input type="checkbox"/>
		Bathing-suit <input type="checkbox"/>
What was the weather like?	 <input type="checkbox"/>	 <input type="checkbox"/>
		 <input type="checkbox"/>
Did you get burnt (painful redness) today?	Yes <input type="checkbox"/>	No <input type="checkbox"/>

OUTDOOR STAY

Did you stay outdoors today?	Yes <input type="checkbox"/>	No <input type="checkbox"/>
For how long time? _____ hours		
At what hours?	9- 11 am <input type="checkbox"/>	1-3 pm <input type="checkbox"/>
	11-13 am <input type="checkbox"/>	3-5 pm <input type="checkbox"/>
How were you dressed?	Fully <input type="checkbox"/>	Shorts and skirt short sleeves <input type="checkbox"/>
		Bathing-suit <input type="checkbox"/>
What was the weather like?	 <input type="checkbox"/>	 <input type="checkbox"/>
		 <input type="checkbox"/>

SUN-BED USE

Have you used a sunbed today?	Yes <input type="checkbox"/>	No <input type="checkbox"/>
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Fig. 1. Diary sheet (translated into English).

stay between men and women or between the two clinics (Table I).

Sunbathing and sunburns

A total of 27/54 of the studied subjects suffered at least one sunburn (painful redness) during the recorded period (Fig. 2).

Among those who sunbathed ($n=44$), 61% got a sunburn. A total of 65/405 (16%) occasions of sunbathing resulted in a sunburn. Patients who reported at least one sunburn had spent more time sunbathing than those who did not get a burn ($t=2.84$, $df=42$, $p<0.01$). Those who were burnt reported a significantly higher number of sunbathing occasions than those who were not ($t=3.31$, $df=42$, $p<0.01$). There was no differ-

ence in the number of sunburns between the sexes or between the clinics.

Clothing

On 378/405 (93%) occasions of sunbathing, the subjects had indicated how they were dressed in one of three categories during sunbathing and outdoor stay. A majority wore a bathing suit while sunbathing, but most were dressed in shorts/skirts and short sleeved shirts during outdoor stay (Table II).

The weather

The weather in Sweden was generally sunny during the summer of 1994. The patients reported the weather in one of three

Table I. Sunbathing and outdoor stay, mean number of occasions and mean duration

	Women (n=28)	Men (n=26)	Gothenburg (n=20)	Stockholm (n=34)
Sunbathing				
Mean number of occasions	10.2	4.6	8.0	7.2
Mean duration (hours)	2.6	2.5	2.8	2.5
Outdoor stay				
Mean number of occasions (days)	26.2	23.9	26.8	25.1
Mean duration (hours)	4.7	4.5	4.3	5.3

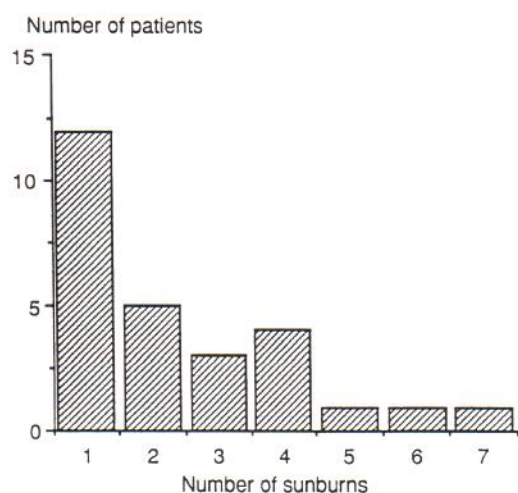


Fig. 2. Frequency of sunburns.

Table II. Clothing when sunbathing and being outdoors

	Sunbathing (n ¹ = 378)	Outdoor stay (n ¹ = 1289)
Fully dressed	5 (1%)	458 (35.5%)
Shorts/skirt and short sleeves	61 (16%)	778 (60.3%)
Bathing suit	312 (83%)	53 (4.1%)

¹ number of recorded occasions

categories for 98% (n=397) of the sunbathing occasions. The weather was sunny on the majority (87%, n=344) of the sunbathing occasions, while it was half-cloudy in 13% (n=53). Corresponding figures for outdoor stay were: sunny 63% (n=859), half-cloudy 29% (n=394) and cloudy 9% (n=120).

Time of day

The patients indicated in five categories the time of the day for sunbathing and outdoor stay. Sunbathing peaked between

11 am and 3 pm, when 67% of the sunbathing occasions occurred. Outdoor stay was more evenly spread during the day.

DISCUSSION

The aetiologic role of sun-exposure in the development of skin cancer is now well established (10). The DNS patients studied had all been subjected to individualised and repeated information on their risk of developing malignant melanoma and about the relation between risk behaviour in the sun and malignant melanoma. Despite this, a majority of the cases reported that they had been sunbathing with the intention to get a tan. Sunbathing occurred mainly during midday and in sunny weather, with a mean duration of 2.5 h on each occasion. In addition, half of the patients reported sunburns, some of them repeatedly up to 7 times during a single month. It is of great concern that this group of melanoma-prone individuals, despite knowing the risks, behave in such a hazardous manner in the sun. Our finding is even more alarming, as this group of patients is more likely to under-report than to over-report this kind of risk-behaviour.

Despite a presumed unwillingness to report high-risk behaviour in this group of patients, we believe that the recordings of sun-exposure are reliable. The validity of the data collection is supported by the fact that those who reported one or more sunburns were the same individuals who worked intensively on getting a tan and who recorded the highest number of h in the sun. The accuracy of the recordings is further supported by a clear difference in time of the day between sunbathing and outdoor stay. The findings that sunbathing was about equally prevalent in patients from both clinics and that the behaviour with respect to timing, clothing and weather was the same for both clinics also indicate that the recordings are reliable.

The conditions of sun-catching in Sweden differ from those in e.g. Australia, in that many Swedes use every sunny hour as an opportunity to sunbathe. This behaviour may not be found in those parts of the world where there is daily access to sunshine. The unusually sunny weather in Sweden during the summer of 1994 might have contributed to the high levels of sun-exposure in our data. The subjects studied were relatively young, which may have affected the outcome of the study. They were, however, recruited as relatives, primarily siblings, children and grandchildren of melanoma patients, and were representative of patients followed at DNS clinics in Sweden. In a Swedish study of 1,700 randomly selected individuals (11), young women exhibited the most hazardous sun-related behaviour as compared to men and older women. This gender difference was replicated in the present study. A higher proportion of women as compared to men sunbathed. Among all those who sunbathed, women reported a higher number of occasions than did men. However, there was no gender difference in the number of sunburns.

Knowledge of sun-related behaviour in populations has mainly been obtained by retrospective questionnaires, assessing the number of burns and the number of h in the sun at different times of the year during a subject's lifetime. The validity and reliability of such retrospective anamnestic data have rarely been considered in previous studies. It is unlikely that people are able to give a correct summary of their lifetime sun-exposure for several reasons, including recall bias. Occasional dosimetric studies have been performed to get

more exact measurements of the UV dose obtained (12). However, personal measurement devices have limitations, especially when recordings are to be made over longer periods of time (12). Obviously, there is no easy way to obtain a correct view of sun-related behaviour in a population.

To maximise the validity and reliability of self-reported behaviour, the recordings have to be made on specified occasions and in a prospective manner (13, 14). Therefore, a diary was developed to collect data on sun-related behaviour on a prospective basis. This registration strategy was tested during 1 month. Seventeen percent of the patients declined to participate, but all who accepted to take part presumably completed the diary. The motivation to participate is high in this group of patients, but the recording is fast and simple and therefore, we believe that this method can be used in other populations as well.

It is alarming that repeated information about preventive measures and risk of melanoma provided by a nurse or a doctor twice a year in connection with a regular skin examination did not prevent the DNS patients from engaging in hazardous sun-related behaviour. In several studies, knowledge about risk has not been associated with protective behaviour in the sun (11, 15–17). Preventive efforts concerning melanoma should not just focus on risk of the disease. It is too optimistic to believe that if people are given the facts about risks they will change their behaviour. The wish for a tan is a stronger force than a future risk of melanoma (18–20), even in subjects with DNS.

It is important to critically evaluate the effects of information and education on risk behaviour, especially in high-risk groups. A new approach would be to arrange group meetings in families with DNS. This might be the right strategy to reach children and adolescents. The effects of information might be strengthened if family members support each other in their effort towards sun-protective behaviour.

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