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Screening for Skin Cancer in The Netherlands

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In the summer of 1989 a screening campaign for skin cancer was organized along part of the beach in the western region of The Netherlands, using a mobile trailer. On 4 consecutive Saturdays, 3,069 individuals were examined. A total of 65 individuals with a suspected lesion were found and referred to their general practitioner. The compliance with referral was 80%. Histological reports, obtained from 46 suspected lesions, showed: 6 melanomas (all with a thickness less than 1 mm), 2 squamous cell carcinomas, 23 basal cell carcinomas, 5 dysplastic naevi and 10 benign skin lesions. The positive predictive value of the visual examination appeared to be 83%. The campaign attracted much publicity. The effects of this publicity were measured by a questionnaire sent to all general practitioners and dermatologists in the region. It appeared that during the campaign and in the ensuing 2 months there had been an increase in the number of diagnoses of benign skin lesions and a moderate increase in the diagnoses of malignant lesions.

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There has been a considerable increase in the incidence of skin cancer during the last three decades. Non-melanoma skin cancer – both basal and squamous cell carcinoma – is the most common form of cancer. Although it is rarely a cause of death, it can lead to substantial morbidity. In several western countries the incidence of melanoma had doubled every decade since the 1930s (1). In Scandinavia it has been suggested that if this rate of increase continues, malignant melanoma will be more common than breast cancer by the year 2000 (2). It is a well-known fact that mortality from melanoma has also increased, although less dramatically than the incidence.

Since, in advanced melanoma, the results of therapy are still poor, early diagnosis at a curable stage is the most important way to reduce the mortality figures. In the past few years this awareness has led to screening programs for skin cancer in the USA (3) and to public education campaigns in Queensland (Australia), Scotland and Leicestershire (England) (4, 5, 6). Screening for skin cancer, i.e. visual inspection of the skin, is a rapid test not requiring any expensive technical equipment. Preliminary data suggest high patient acceptance (7). The predictive value of such screening is still the subject of discussion. In Europe, population screening for skin cancer is not yet considered necessary or cost-effective. However, if high-risk groups could be concentrated on, screening could be more rewarding.

Since sun exposure is believed to be an important cause of non-melanoma skin cancer, and may also be involved in the pathogenesis of melanoma, we decided to organize a screening campaign using a mobile trailer to canvass the beaches in the western region of The Netherlands. In this way we expected to attract individuals with a relatively high sun exposure: a concomitant practical advantage in examing people on the beach is that they are already for the most part undressed.

The aim of the campaign was two-fold:

1) to measure the direct yield of this skin screening program,
2) to investigate the indirect effects related to the publicity accompanying this campaign.

METHODS

In an adapted trailer, four seaside resorts in a part of the western region of The Netherlands (Noordwijk, Katwijk, Scheveningen, Kijkduin) were visited in June and July 1989 on 4 consecutive Saturdays. Where possible, the trailer was parked at a central location on the boulevard, close to an approach route to the beach. Before the actual screening

*In The Netherlands, eight Comprehensive Cancer Centers cover the entire country geographically. The Comprehensive Cancer Center West (CCCW) serves a part of the western region of the country, containing the cities Delft, 's-Gravenhage (The Hague), Leiden and Gouda. This region has 1.58 million inhabitants.

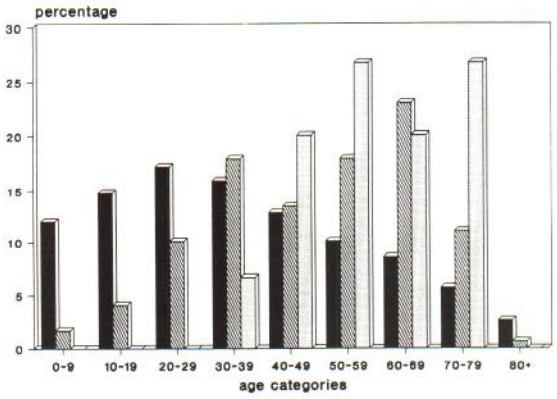

Fig. 1. Comparison of the age distribution of the Dutch population (■, Source Central Bureau of Statistics, The Hague, The Netherlands), the examined individuals (▨, derived from the questionnaire handed out to every tenth visitor) and the individuals with biopsy-proven malignant lesions (□).

there had been publicity about this campaign in the regional and national press. It was clearly indicated on the outside of the unit the screening performed by a total of 8 dermatologists and 4 surgeons was free of charge. Each visitor could choose between a complete skin examination or the examination of one particular abnormality. When there was a suspicion of skin cancer the person concerned was informed, and advised to visit his/her own general practitioner. A brief note was sent to the patient's general practitioner with details about the suspected lesion. The general practitioners were contacted after about 2 months and asked about the follow-up.

In order to gain an insight into the characteristics of the examined group, such as age, sex, skin type, and place of residence, every tenth visitor was given a questionnaire to complete.

The skin type was graded as: 1 = always burns, never tans; 2 = always burns, tans rarely and with difficulty; 3 = rarely burns, tans easily; 4 = never burns always tans; 5 = dark skin, Mongoloid skin; 6 = black skin, Negro skin. To measure the *indirect* effect of this campaign a questionnaire was sent out to all general practitioners and dermatologists working in the CCCW* region (856 and 25, respectively), approximately 2 months after the last screening day. This questionnaire focused on the estimated number of skin cancer related consultations, the amount of (diagnostic) surgery for suspected skin lesions and the estimated number of benign and malignant abormalities of the skin diagnosed in this period. They were asked to relate this to the usual pattern during a similar period in previous years.

RESULTS

A total of 3,069 individuals were screened for skin cancer, 65 (32 men, 33 women) were found to have a lesion suspected to be malignant. Twenty-two (34%) of the suspected lesions were localized on the head, 24 (37%) on the trunk, 17 (26%) on the extremities and the localization of two lesions was unknown. The age distribution of the 65 persons with a suspected lesion is shown in Fig. 1.

From these 65 suspected lesions we received histology reports in 46 cases, leaving a group of 19 without a pathological diagnosis. In 10 cases, further information was not available. We learned that therapy was performed without histological verification in 5 cases; 3 individuals did not contact their general practitioner. In one case the family physician for unknown reason did not recommend excision of the lesion. In 38 of the 46 histologically investigated lesions the biopsy results confirmed the clinical diagnosis (see Table I). Six melanomas were found: 2

Table I. *Comparison of clinical and pathological diagnoses of the 46 histological investigated lesions*

Clinical diagnosis		Pathological diagnosis	
Melanoma	7	Melanoma	6
		Dysplastic naevus	1
Basal cell carcinoma	24	Basal cell carcinoma	23
		Lichen planus	1
Squamous cell carcinoma	2	Squamous cell carcinoma	2
Dysplastic naevus, melanoma to be excluded	9	Dysplastic naevus	4
		Other naevi	4
		Seborrheic wart	1
Seborrheic wart, melanoma to be excluded	1	Seborrheic wart	1
Kerato-acanthoma, squamous cell carcinoma to be excluded	1	Kerato-acanthoma	1
Naevus naevocellularis, melanoma to be excluded	1	Naevus naevocellularis	1
Lentigo maligna melanoma	1	Seborrheic wart	1

Table II. *Results obtained from the questionnaires distributed to general practitioners and dermatologists in the CCCW region (* numbers represent percentages of responders)*

Question Opinion	Type of doctor	Given answers			
		More	Same	Less	None
No. consultations related to skin cancer	General practitioners	83*	14	0	3
	Dermatologists	90	10	0	0
No. excised lesions	General practitioners	29	58	0	13
	Dermatologists	67	33	0	0
No. diagnoses of benign skin lesions	General practitioners	67	27	0	6
	Dermatologists	71	29	0	0
No. diagnoses of malignant skin lesions	General practitioners	8	77	2	13
	Dermatologists	38	62	0	0

lentigo maligna melanoma, 4 superficial spreading types with Breslow thickness 0.25, 0.75, 0.88 and 0.9 mm, respectively. Of the 19 suspected lesions without pathological diagnosis, two had a high index of suspicion for lentigo maligna melanoma; one was diagnosed as a congenital naevus and three as dysplastic naevi with a low index of suspicion for melanoma. The remaining 13 lesions were suspect for non-melanoma skin cancer. The questionnaire, given to every tenth screenee, was completed by 296 persons (64% female, 36% male). Twenty-two individuals (7%) had skin type I, 99 (33%) skin type 2, 145 (49%) skin type 3, 26 (9%) skin type 4, one skin type 5, and none skin type 6. For 3 (1%) persons, the skin type was not recorded.

In Fig. I the age distribution of this group is shown. The calculated incidence of the 31 histologically proven malignancies for each age category is: 0.36% in the age category 30–39, 1.45% in the 40–49 group, 1.46% in the 40–59 group, 0.99% in the 60–69 group and 2.34% in the 70–79 group.

A total skin examination was requested by 25% of the screenees, while 75% asked for an examination of one or more specific lesions. The results of the questionnaire completed by general practitioners and dermatologists are shown in Table II.

DISCUSSION

Skin cancer is in theory an ideal subject for screening. The incidence is increasing continuously and early therapy has been proven to reduce mortality and morbidity. Moreover the screening test is very simple. Consequently in the United States there is much interest in screening (3). Our results represent the first Dutch screening figures. The incidence of skin cancer in The Netherlands was recently estimated to be about 10 per 10,000 (melanoma and squamous cell carcinoma: 1 per 10,000 each; basal cell carcinoma: 8 per 10,000) (8). The comparable figures found for people examined in this study are considerably higher: 1 skin cancer per 100 screened. If 10,000 individuals had been examined the comparable figures would be: 100 per 10,000 (melanoma: 20 per 10,000; squamous cell carcinoma: 7 per 10,000; basal cell carcinoma: 73 per 10,000). However, after age correction, the comparable figure is 61 per 10,000.

The American experience was recently discussed in great detail by Koh et al. (3). In 1973 Lynch et al. (9) published their results obtained by screening 3,040 people, using a mobile house trailer. Fifty-one histologically confirmed skin cancers were found. Biopsy results, however, were not available on many other suspected lesions. Biro et al. (10) reported on the screening of 877 persons in Brooklyn: 96 basal cell carcinomas, 6 squamous cell carcinomas and one nodular melanoma were found. Rigel et al. (11) screened 2,239 persons and found 14 cases of melanoma, verified by biopsy. Several other skin cancer screenings were published, but data on biopsy results are not available in these studies. When comparing these figures with our results it is important to realize that the incidence of skin cancer is higher in the USA than in The Netherlands.

From these results, including the present study, it can be concluded that skin cancer screening campaigns attract to some degree individuals with a higher risk. We anticipated this phenomenon by localizing our campaign close to the beach, thus hop-

ing to attract individuals with a higher sun-exposure, especially sun-worshippers.

From the questionnaire handed out to every tenth visitor it can be concluded, as we already suspected, that we only partially succeeded in this respect. The people we screened were mainly inhabitants of the resort we visited that particular day, or of the surrounding towns and villages. They were not sun-lovers in particular, but since the population of the coast region has a high proportion of outdoor workers, it may be assumed that they still had a considerable amount of solar exposure. Another risk factor for skin cancer is old age and, as can be seen in Fig. 1, in our campaign a relatively high proportion of old individuals was examined.

In the present study the positive predictive value of the screening test (visual inspection) was 83%. Two other groups found that the predictive value of such inspection of non-melanoma skin cancer varied from 64 to 84%, depending on the level of training of the examiner (12, 13). We have no data on false-negative screens. Consequently we cannot draw firm conclusions on the sensitivity and specificity of our screening. However, since skin cancer is still relatively rare, we can estimate that the specificity, being true negative screens, divided by true negative + false-positive screens will be about 99%. The sensitivity of visual screening is still a subject of considerable debate especially as far as melanoma and its precursors are concerned. It was not possible to come to any conclusions on this subject following our investigation. Finally, the compliance with referral was quite high: 80%. Only one comparable figure is available – that of Zagulla-Mally et al. (14): 39.5%.

We believe that the publicity, which was beyond our expectations, was responsible for an enlargement of the yield of the campaign. In our region, having 1.58 million inhabitants, there was a definite increase in patients consulting their general practitioner about skin lesions. This led to a higher number of excisions, a higher number of diagnosed benign skin lesions and a slight increase in the number of skin lesions diagnosed as malignant, compared with preceding years. An increased number of patients with suspected lesions were referred to dermatologists; here the increase in diagnosed malignant skin lesions was more pronounced. The impact of the publicity in our region and in the rest of the country was considerable, although not an aim of our activity. An unavoidable negative effect of the publicity is that relatively more benign tumours are excised and that some alarm is aroused among the public. However, we received, no information that this alarm was of any importance. A positive effect is that the publicity contained information about the relation between sun-exposure and skin cancer and also about how to recognize skin cancer at an early stage. Recently it was shown (5, 6), that the latter information can contribute to an earlier diagnosis of melanoma; in one calender year and the following year of a public education campaign aimed at encouraging earlier self-recognition of melanoma, a statistically significant rise was seen in the percentage of thin melanomas with a good prognosis. Concomitantly there was a significant fall in the proportion of thick lesions having a poor prognosis. One of the most interesting findings in our study was that in all diagnosed melanomas the thickness was less than 1 mm, making the prognosis very good. Therefore in the majority of these cases the early diagnosis reduced mortality and morbidity to a considerable degree. We conclude that on the basis of both the direct and indirect results of this campaign, the organization of further screening for skin cancer should be recommended. The yield can be increased if people are better informed about risk factors by improving public education; low-risk groups such as people under the age of 20 may be excluded from screening, making screening even more effective. Finally, the increasing incidence of skin cancer can be expected to steadily increase the yield of screening programs.

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