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Melanocytic Naevus or Malignant Melanoma? A Large-scale Epidemiological Study of Diagnostic Accuracy

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While the early detection of malignant melanoma is important and has been emphasized widely in the past few years, it is difficult to accomplish. The purpose of this study is to assess how well dermatologists recognize malignant melanomas in patients with naevi. Information from 9,121 patients visiting two dermatological clinics in Stockholm and diagnosed melanocytic naevi was linked with the Swedish Cancer Registry to identify individuals with records of malignant melanoma. One-hundred-and-thirteen cases of malignant melanoma were detected in the study population. Sixty patients were diagnosed malignant melanoma prior to the naevus diagnosis and most of them were under continuous follow-up. A further 35 patients were diagnosed malignant melanoma and naevus at the same time. The remaining 18 were given the diagnoses malignant melanoma after the naevus diagnosis and, of these, 6 cases were detected more than 6 years after examination and malignant melanoma was considered not present at the time of consultation. Three cases can be considered as missed (6%) and four others as partially missed or delayed. Thus, of 47 cases of probable recognizable malignant melanoma, there was insufficient management of 7 (15%). Six cases were detected during dermatological examination for other conditions and five through general examination of naevi. Although a few possibly detectable malignant melanomas were not discovered, the results of this study reflect a high clinical detection rate. In addition, a number of cases were discovered by chance during examinations for other dermatological conditions. Key words: cancer; diagnosis; epidemiology; naevus; neoplasm.

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The clinical diagnosis of malignant melanoma (MM) can be difficult. Dermatologists are generally better than non-dermatologists at correctly identifying MM (1–5), and there is an increasing ability to identify MM as experience in dermatology increases (6). Several studies show a correct clinical diagnosis (index of suspicion) in only 50–70% of MM cases (1, 6–10). We therefore believe that most dermatologists will fear that the patient just examined for malignant transformation in any naevi will reappear with a malignant melanoma shortly after the investigation. The question “How well do dermatologists recognize malignant melanomas?” is a burning one which deserves attention not least in relation to the many screening campaigns promoted today.

To test the hypothesis that a number of MM will be missed

even when the patient is carefully examined by a specialist, we linked information from 9,121 patients seen for naevi at two dermatological clinics in Stockholm with the compulsory Swedish Cancer Registry to identify individuals among them with MM. Patients who visited the clinics for naevi prior to the diagnosis of MM were of special interest.

PATIENTS AND METHODS

Study subjects

From 1976 to 1991 there were 5,719 patients registered with the diagnosis of naevi at the Department of Dermatology, Karolinska Hospital, and from 1970 to 1991 there were 3,402 patients registered at the Department of Dermatology, Danderyd Hospital, both hospitals located in Stockholm, Sweden. Information on these patients was available from the case notes and from the histopathological reports. It was possible to follow-up the patients in different registries at other departments, hospitals, pathology laboratories and in the Swedish Cancer Registry.

The study population of 9,121 patients (Fig. 1) comprised 5,843 females and 3,278 males (median age 30 years; age range 0–95 years). With a mean follow-up time of 6.3 years (range 0–21 years), 4,276 patients were observed for ≤5 years and 4,845 for >5 years. The number of person-years of observation was 57,848.

Swedish Cancer Registry

The patients were matched with records in the Swedish Cancer Registry, Stockholm, to identify individuals with malignant melanoma in the population (1958–1991). The Registry has been collecting information on cancer incidence in Sweden since 1958, when compulsory registration of cancers began. Reports of diagnosed cancers come from both clinicians and pathologists. Thus, most cases are reported by two sources. Data on each patient were matched with a unique personal identification number (PIN) used in all population statistics in Sweden. This number comprises six digits based on year, month, and day of birth, a three-digit registration number, and a check digit. PINs are not therefore affected by name changes. The completeness of registration is close to 100% for all cancers (11).

RESULTS

In the population of 9,121 patients with naevus, 113 MMs were found.

MM before naevus

Sixty patients were diagnosed MM before the diagnosis of naevus and can be considered as being under continuous observation, although some had not informed the examining dermatologists that they had previously had a MM. No new MMs were detected in this group.

Table I. Contact data. Malignant melanoma diagnosis in association with naevi examination

Initiator of examination	Reason for examination	No.	(%)
Patient:	Special naevus	11	(31)
	General naevi examination	3	(9)
	Naevus pointed out when examined for another dermatological condition	2	(6)
Referral doctor:	Special naevus	7	(20)
	Suspicion of malignancy	6	(17)
	General examination	2	(6)
Dermatologist:	Checking patient for another dermatological condition	1	(2)
	Chance, during examination for another dermatological condition	3	(9)
	Total	35	(100)

MM and naevus at the same time

Thirty-five patients received the diagnosis of MM and naevi at the same time. Superficial spreading MM was seen in 27, nodular in 4 and lentigo maligna melanoma in 4. The contact data and referral patterns are summarized in Table I. In 18 cases the referral doctor or the patient had pointed out a special naevus, but in 5 cases the patient came for general naevi examination and the examining dermatologists were able to diagnose a MM among the patient's naevi. In four cases the dermatologist dis-

covered a MM by chance when examining the patient for a dermatological condition other than naevi.

The biopsy techniques employed were excision in 26, punch in 8 and shave in 1. Eight of the excisions were referred to a surgeon.

MM after naevus

Eighteen patients received the diagnosis of MM after the diagnosis of naevus. Of these, six patients were diagnosed MM 6–12 years (mean 9 years) after the initial naevi examination; we presume that the MM were not present at that time. We have chosen 6 years as a reasonable limit for developing MM, but some of the MMs might possibly have been detectable at the naevus investigation, especially as five were of the slow-growing superficial spreading type and only one was nodular.

Four other patients were under regular control for large numbers of naevi and/or previous extensive sun exposure (e.g. one patient had lived for many years in Africa). One of these patients pointed out a special naevus, but in the other three the MMs were discovered by the dermatologist. All these MMs were of the superficial spreading type.

In one case there was a "doctor's delay". The dermatologist referred the patient, a 39-year-old female, to a surgical department with the suggested diagnosis of naevus, but the referral letter disappeared. However, the patient visited the surgical department on her own initiative after 6 months, when a superficial spreading MM (Clark V) was found.

In two cases there was a "patient's delay". A 61-year-old female was referred by a general practitioner for a naevus on a toe. She visited the dermatologist at once but there were so

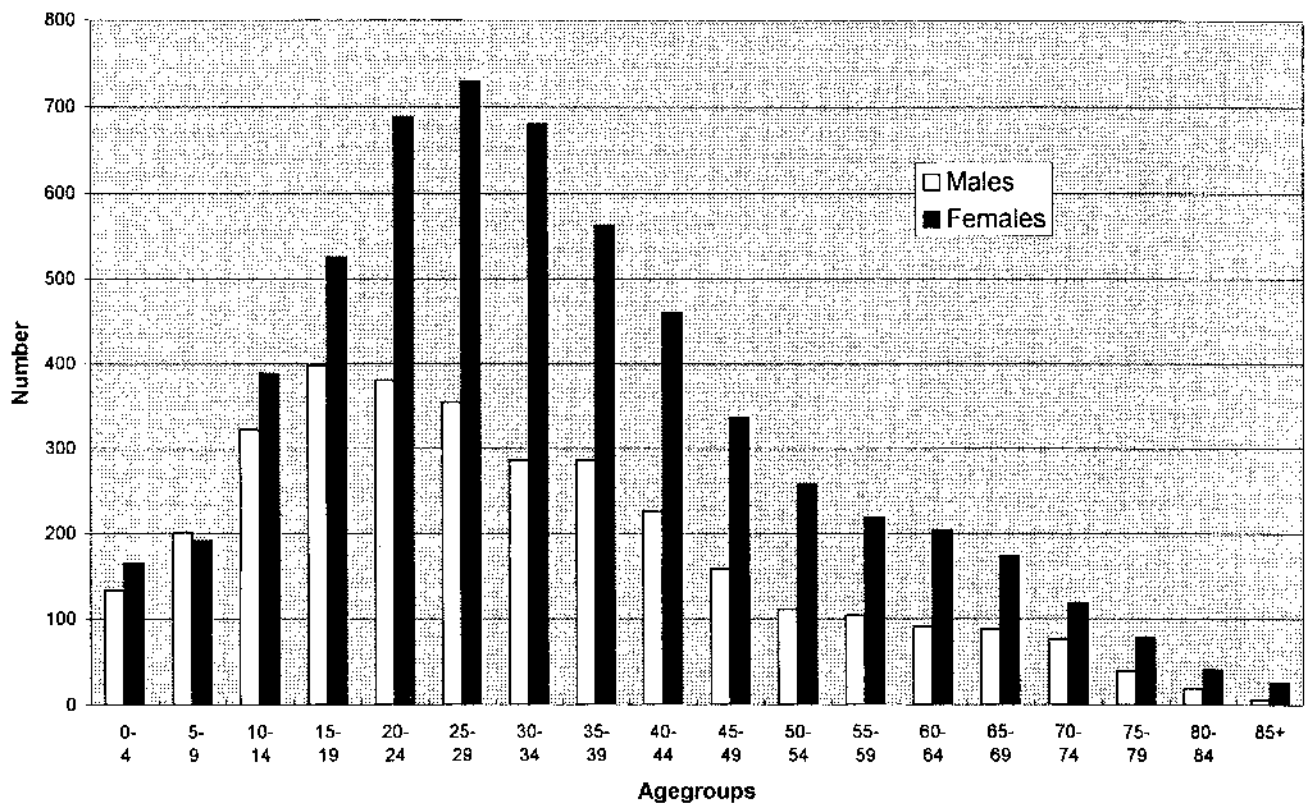


Fig. 1. Population characteristics.

Table II. Patients with malignant melanomas initially not discovered by a dermatologist's examination

Patient: Age/sex (years)	Initial examination of dermatologist		Malignant melanoma discovery			
	Initiator and reason for examination	Site examined	Measures	Time delay (years)	Initiator of examination	Type of melanoma
20/F	Referral letter for general examination of naevi	Trunk	None	2	Patient	SSM Clark III Breslow 0.45 mm
20/F	Patient, for general examination of naevi	Whole body	None	1.5	Patient	SSM Clark II
63/F	Patient, for a special naevus	Naevus right leg	Punch biopsy Histopathological examination with no sign of melanoma a No controls	2	Patient	SSM Clark III Breslow 1.1 mm
67/F	Dermatologist, Control patient for basalioma	Pigmented lesion on left chin	2 punch biopsies Histopathological examination with no signs of melanoma No controls	4	Patient	SSM Clark II Breslow 0.8 mm
74/M	Referral letter for general examination of naevi	Whole body	2 benign naevi removed from back	1	Patient	Nodular Clark IV Breslow 1.3 mm



Fig. 2. Development of a melanocytic naevus into superficial spreading malignant melanoma. (a) Marked naevus initially considered to be benign. (b) Before removal after 1.5 years. Histopathological examination revealed a superficial spreading malignant melanoma (Clark III, Breslow 1.16 mm).

many patients in the waiting room that she left the clinic without proper examination. However, the dermatologist noted the referral letter and referred the patient to a plastic surgeon. The patient was then called to the plastic surgeon three times but did not show up. After 5 years a surgeon took a punch biopsy from the lesion on the foot. Histopathological examination showed a superficial spreading MM (Clark II, Breslow 0.6 mm) and the patient's toe was thereafter amputated. The other patient was a 24-year-old male referred to the dermatology clinic for multiple clinical dysplastic naevi without a family history of melanoma. At the first visit all naevi were photo-documented. At a check-up 1 year later the dermatologist considering the pictures of the naevi suggested that one naevus on the chest should be removed. However, the patient preferred to wait because he had a strong tendency to keloid formation and the dermatologist did not insist. The patient was booked for a 1-year check-up schedule but he presented 6 months later, when the naevus was removed (Fig. 2). Histopathological examination showed a superficial spreading MM (Clark III, Breslow 1.16 mm).

In five cases the MM were not discovered during the dermatologist's examination (Table II). In two of these cases, histopathological examination (punch biopsies) of the suspected lesions revealed no signs of malignancy. The specimens were

re-examined as part of the present study and in the case of the 67-year-old female a lentigo maligna was detected in one of the two punch biopsies. The patients were not then followed-up. In three cases a general examination of the naevi did not result in the discovery of the MMs. All the missed cases, the three totally and the four partially missed, were followed-up and were alive 5–13 (mean 8.7) years after the MM diagnosis.

DISCUSSION

Early diagnosis is the key to preventing death from MM and the easy access to the skin for examination makes this goal feasible. Delay in diagnosis and treatment is usually the result of patient denial or ignorance about the consequences of a new or changing naevus rather than physicians' delay in diagnosis and treatment (12). However, mass education and screening campaigns have resulted in an increasing number of cutaneous examinations for recognizing MM, and are leading to a demand for high clinical accuracy. Dermatoscopy and, in the future, computer imaging analysis might enhance the doctor's ability to diagnose these difficult lesions. Methods such as these are necessary if the clinical accuracy of MM is to be developed today: an index of suspicion between 50 and 70% (1, 6–9) is not satisfactory. Fortunately, this study provides data that prove high clinical accuracy amongst the dermatologists involved. Of 47 cases of detectable MM, there was insufficient management of the patients in 7 (15%).

What conclusions can be drawn from the missed cases? In two, young females, the dermatologists did not examine the site of the MM. This highlights the importance of examining patients completely. In two elderly females, punch biopsies had been used and the histopathological examinations showed no sign of malignancy, which strengthens the importance of excisional biopsies for accurate examination and the need for follow-up.

The dermatologists involved in the missed cases all had between 5 and 25 years' experience of dermatology. Remarkably, two cases had also been examined by medical students and also by two clinical teachers in dermatology. Thus, clinical presentation of the MMs in those cases must have been atypical. The fact is that dermatologists today are challenged to diagnose thinner lesions, often *in situ*, before the lesions have developed the full spectrum of clinical features characteristic of MM. Consequently, there are fewer of the "easy-to-diagnose" type and there are more subtle lesions to recognize. A way out of this dilemma is to surgically remove every atypical or suspect pigmented lesion which can be considered as a potential precursor of MM. This solution is probably applied by a number of general practitioners and surgeons, but is impossible in most cases of multiple naevi. Based on the results of this study we conclude that the most cost-effective handling is to refer patients with pigmented tumours to specialist clinics.

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