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Audit of public education campaign to encourage earlier detection of malignant melanoma

Rona M MacKie, D Hole

Abstract

***Objectives*—To evaluate a public campaign to encourage earlier referral and treatment of primary cutaneous malignant melanoma and thus reduce mortality related to melanoma.**

***Design*—Production and distribution of educational material aimed at adults. Update information sent to general practitioners before campaign. Analysis of data on melanoma before and after campaign in June 1985.**

***Setting*—West of Scotland, population 2·7 million.**

***Main outcome measures*—Total numbers of referrals per month to melanoma clinic, numbers of melanomas diagnosed, change in distribution of thickness, and mortality before and after introducing the campaign.**

***Results*—Referrals to the pigmented lesion clinic increased by 278%, from five a week in June-July 1984 to 19 a week in June-July 1985. Twice as many women as men were referred to the clinic (49% of referrals were of women aged under 65). The numbers of newly diagnosed primary cutaneous melanoma were 63 (12/month) in January-May 1985 and 146 (21/month) in June-December 1985, an increase of 131%. The percentage of tumours detected that were less than 1·5 mm thick rose significantly by 16% (95% confidence interval 11% to 19%), from 38% (328) in 1979-84 to 54% (592) in 1985-9. Mortality began to fall in women from 1988.**

***Conclusions*—The public education campaign succeeded in reducing the absolute number of thick tumours and melanoma related mortality in women.**

Department of Dermatology, University of Glasgow, Glasgow G12 8QQ
Rona M MacKie, *professor of dermatology*

Cancer Surveillance Unit, Greater Glasgow Health Board, Glasgow
D Hole, *senior statistician*

Correspondence to:
Professor MacKie.

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Introduction

Since 1979 the Scottish Melanoma Group has recorded clinical and pathological data on all invasive melanomas diagnosed in Scotland (population 5·1 million). Between 1979 and 1990, 4399 melanomas were registered by the group.[1] In 1984 it was observed that in comparison with other countries there were a high proportion of patients in Scotland with thick primary tumours (≥3·5 mm thick). As primary tumour thickness is well established as the most important prognostic factor a decision was made to introduce a public education campaign aimed at encouraging detection of melanomas when they were thinner and thus in time reducing mortality related to melanoma. Previous work had established that the main reason for delayed referral and thicker tumours seemed to be lack of public knowledge of the features of early melanoma rather than inappropriate advice or treatment by general practitioners or hospital induced delays in instituting appropriate treatment.[2] We report the effects of a public education campaign aimed at early detection six years after its introduction.

Methods

PREPARATION FOR CAMPAIGN

Details of the organisation of the campaign have been published.[3] It was decided to base the campaign on initial screening by family doctors and to provide for them a no waiting list rapid referral weekly specialist clinic for immediate assessment and biopsy or treatment as appropriate. A sample of 100 local general practitioners were asked to collaborate and to state what if any preparatory activities would be of value. Suggestions to the general practitioners included booklets on recognising early melanoma and related topics, videos for practice use, problem solving case histories tapes, and recorded telephone message. Eighty seven general practitioners indicated that they supported the proposal.

Most doctors expressed a wish for update material, mainly in the form of a booklet on melanoma. This was prepared, with comments and suggestions from 43 general practitioners. A companion booklet on benign melanocytic naevi, a set of 12 problem solving case histories, and a teaching video were also prepared. During the four months before the launch of the public education campaign this material was circulated to all Glasgow based general practitioners and to a high proportion of practitioners in adjacent health boards in the west of Scotland. In addition plans for the educational activity were widely publicised at general practitioners' study days, at hospital meetings, and at meetings organised specifically for nurses and other health care professionals.

The material for public education comprised colour

leaflets and posters illustrating the features of early melanoma and encouraging early referral. These were prepared in collaboration with professional health educators and their impact was evaluated before the design was finalised. Material was distributed to surgeries, health centres, well woman and family planning clinics, citizen's advice centres, and to factory nurses for display in the workplace.

The public education campaign was launched with a press release in late May 1985, which stimulated interest from a wide range of local and national newspapers as well as radio and television. Since this time no deliberate effort has been made to repeat the exercise in the west of Scotland, although requests continue for update information for general practitioners and for further supplies of both professional and public educational material.

In 1987 seven other British centres launched similar activities based on the Glasgow model. Although this had no detectable effect on referrals to our pigmented lesion clinic, these activities have helped maintain a greater public awareness of the problem of malignant melanoma.

AUDIT MEASURES

The initial audit measures were the change in number of patients general practitioners referred with suspicious pigmented lesions and the number of melanomas newly diagnosed in each of the last seven months of 1985 (after the introduction of the campaign) compared with the first five months of 1985.

We also calculated change in the relative proportions of patients presenting with thin (<1·5 mm) primary melanomas before and after educational intervention (1979-84 *v* 1985 onwards) after adjustment for other factors associated with thinner primary lesions. Analysis of 3903 patients presenting with melanoma in Scotland during 1979-89 showed these factors to be female sex, limb lesion, younger age, and superficial spreading type of melanoma.[1] In addition, the absolute number of thick lesions ≥3·5 mm would be expected to fall. The final audit measure was the mortality related to melanoma.

We originally intended to compare data on the west of Scotland intervention group (population 2·7 million) with data from the rest of Scotland (population 2·4 million) which would form the non-intervention group. In the event the overspill of publicity on television, radio, and in the national press resulted in the rest of Scotland receiving information, although there were no leaflets, posters, or public meetings in 1985.

The current incidence of melanoma in Scotland is more comparable with that in Denmark than that in England and Wales or other Scandinavian countries.[1] Trends in melanoma related mortality for Denmark have therefore been used for comparison as Denmark had no formalised public awareness campaign during the study period.

Scottish mortality data and population denominators are from the annual reports of the registrar general for Scotland 1979-89. All deaths from melanoma are cross checked with Scottish Melanoma Group data.

STATISTICAL ASSESSMENT

Underlying trends in incidence and mortality were taken as the predicted equations derived from the best fit linear regression equations of rates over time. No significant improvement was found by using more complex models. Probability values for the significance of the trends were calculated by testing the significance of the gradient of the regression model. Comparison of the proportion of tumours <1·5 mm over time while adjusting for changes in other variables found to be associated with thin primary tumours (sex, tumour type, and anatomical site) was done by logistic regression analysis.[4]

Results

After the launch of the public education campaign the numbers of patients referred to the no waiting list pigmented lesion clinic rose from 40 new cases (five a week) in June-July 1984 to 151 new cases or (19 a week) in June-July 1985, an increase of 278%. Attendance at such clinics is seasonal. Sampling of a small number of general practices showed that though the number of patients consulting their general practitioner about pigmented lesions had risen, the number remained manageable at about two patients per practitioner per week.

In the first five months of 1985 the numbers of melanomas diagnosed per month in the whole of the west of Scotland were 13, 10, 11, 17, and 12, a total of 63 and mean of 12 per month. In the remaining seven months of the year the numbers rose to 25, 12, 24, 24, 19, 21, and 21, a total of 146 and mean of 21 per month. The specificity of the campaign was one melanoma diagnosed for every 22 referrals to the clinic.

The numbers of new general practitioner referrals to the pigmented lesion clinic remained high throughout 1985 and in subsequent years. Analysis of 500 consecutive attendees showed that 66% were women and 34% men, compared with 52% women and 48% men in the total population. Women under 65 comprised 49% of attendees (38% of population) and those aged 65 and over 17% of attendees (14% of population). Men under 65 were 21% of attendees (43% of population) and those 65 and over 12% (5% of population). Thus women, particularly younger women, were proportionately overrepresented at this clinic and younger men underrepresented.

Analysis of the change in distribution of tumour thickness among three categories (<1·5 mm, 1·5-3·49 mm, and ≥3·5 mm) from 1979 to 1984 showed no significant changes. Specifically, there was no significant trend towards thinner tumours in the five years before public education in any part of Scotland.[3] In 1985-9, after the public education campaign, 1092 primary cutaneous malignant melanomas were newly diagnosed in the west of Scotland. The absolute number and relative percentage of thin tumours rose to 592 (54%), and there was a significant increase of 16% in the proportion of patients presenting with thin tumours ($\chi^2=14$, df=2; $p<0·001$, 95% confidence interval 11% to 19%). The higher proportion of patients presenting with thinner, good prognosis tumours was maintained during 1986-9.

Figure 1 shows the change in proportion of primary melanomas less than 1·5 mm thick in each year compared with 1979 figures after appropriate adjustment for other features significantly associated with thinner lesions.[1] Before 1985 there was no significant change but from 1985 onwards a significant and sustained shift ($p<0·01$) towards thinner tumours occurred. When the data for the whole of Scotland were subdivided into the west and the rest of Scotland, a significant change was seen for the west beginning in 1986, but the change in the rest of Scotland did not reach significance until 1988.

Figure 2 shows the rate of occurrence of thick primary melanomas (≥3·5 mm) year by year. For women this rate started to fall significantly ($p<0·05$) from 1988 onwards, but no downward trend was seen for men. During 1979-90 the incidence of all primary melanomas in women rose by 67% from 6·6/100 000 in 1979 (176 cases) to 11·0/100 000 (307 cases) in 1990. It is therefore encouraging that both the rate and the absolute number of thick tumours in 1990 were at a 12 year low.

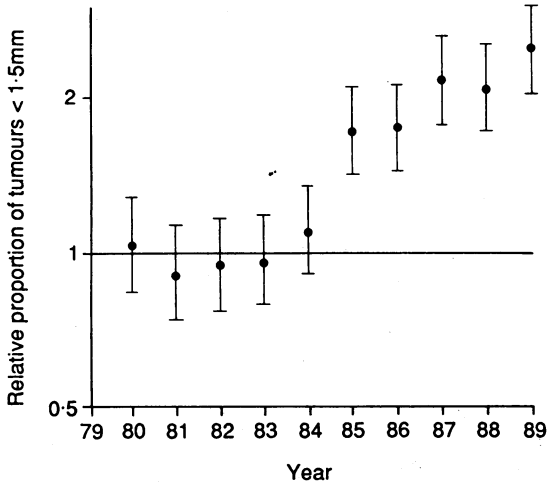

FIG 1—*Proportion of melanomas with a thickness <1·5 mm by year of diagnosis relative to proportion in 1979 (taken as unity) and adjusted for age, sex, tumour type, and site. Proportions are plotted on a log scale*

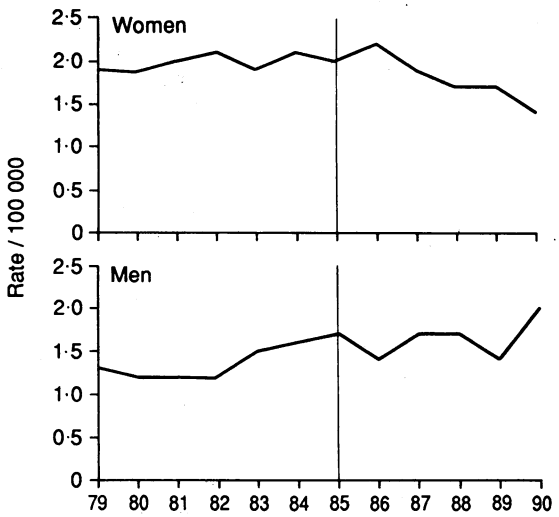

FIG 2—*Rate per 100 000 population of melanoma ≥3·5 mm thick in men and women in Scotland*

Figure 3 shows mortality related to melanoma. Before 1988 the trend for both men and women was upwards but from 1988 mortality fell in women but not in men. Mortality data from Denmark over the same period show a rise of 2·0-2·5/100 000 population for 1983-7 compared with 1988-9 for women and 2·7-3·3/100 000 for men. (A Osterlind, personal communication).

Discussion

Public education campaigns aiming at encouraging earlier diagnosis of melanoma are currently in progress in Australia, the United States, Germany, and other European countries. These have been initiated because of the increasing incidence of melanoma worldwide and also because cutaneous melanoma fulfils the criteria for a condition suitable for programmes to promote early detection. These criteria are that the condition is a serious public health problem, that there is a simple, diagnostic test (visual inspection in this case), and that there is effective treatment for lesions detected early. Careful evaluation of such activities is necessary to establish whether they reach the target population, stimulate appropriate action (earlier self referral with thinner primary tumours), and in time lead to reduced mortality. The availability of detailed information on all melanomas in Scotland for the five years before the campaign has offered a valuable and possibly unique opportunity to evaluate the effects of such a campaign.

The problems of lead time bias and the reduction in the ultimate effectiveness of such screening or early detection programmes are well recognised in breast cancer screening. Clearly longer term and continuing evaluation of this campaign is required and is in progress.

The longest running melanoma education campaign is in Queensland, where mortality continues to rise after education but at a less rapid rate than incidence.[5,6] No similar data are yet available from countries with a lower incidence. In the United States, where melanoma education is based on "walk in" self referral clinics or skin cancer fairs which do not offer treatment but can only counsel those with suspected malignant lesions to seek medical advice,[7] only one melanoma is diagnosed per 250 patients screened compared with one per 21 referrals to pigmented lesion clinics in the west of Scotland. This difference is probably largely due to the fact that in Scotland family doctors are used as initial screeners and clearly screen patients with considerable efficiency. No data are available from the United States on either change in thickness of lesions at diagnosis or melanoma mortality in targeted versus non-targeted populations.

Thus the west of Scotland campaign supports the role of the family doctor in initial screening. Without this, the hospital system would have been severely overloaded. An additional bonus was that the quality of referral letters rose noticeably after updating general practitioners before the campaign, and most of these letters now clearly indicate the degree of suspicion that the lesion is a melanoma and offer an appropriate differential diagnosis.

The observed greater trend towards a reduction in both thick tumours and melanoma mortality in women is consistent with the 2:1 female preponderance in clinic attendance. This may in part be due to overspill of the educational material into women's magazines, as many carried useful and informative summaries of the message in the months after introduction of the campaign. There is no comparable channel of communication for men, but men attending the clinic had often been advised to do so by a female friend or relative. The reverse did not apply to women attending the clinic.

PROBLEMS WITH EDUCATIONAL PROGRAMMES

Our experiences illustrate the difficulty of evaluating the benefit of an education exercise. The theoretical model for such an exercise is two populations of similar phenotype in which the proportion of thick melanomas

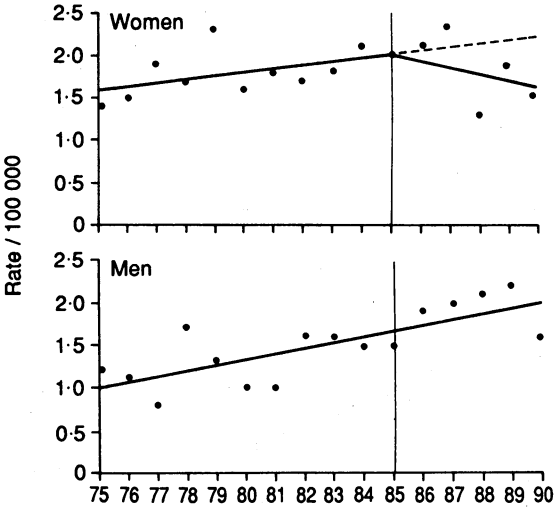

FIG 3—*Mortality (rate/100 000 population) related to melanoma in men and women in Scotland, 1975-90. The absolute rate/100 000/year is shown. Continuous lines show actual mortality trends and dotted line in women's chart is projected rate if trend before 1985 had continued*

and rate of rise of melanoma mortality are known. One group is then subjected to educational material to which the control group is not exposed and changing patterns of presentation and mortality compared in the two groups. Although this is what was originally planned in Scotland, it was quickly apparent that television was by far the most powerful educational medium, and television channels are relatively unrestricted in their distribution. Furthermore, a story regarded as newsworthy in one area is quickly publicised by television, radio, and newspapers in adjacent areas. In addition, organisers of campaigns such as this have no control over the spread of information in the secondary wave of publicity in women's magazines, etc. Thus, although not ideal, it was necessary to accept the compromise of changes in thickness and mortality in the intervention group before and after intervention as a reasonable measure of efficacy.

Conclusion

In conclusion, audit of the west of Scotland melanoma education campaign shows encouraging evidence that for women the appropriate population has been targeted and patients are now attending for treatment with thinner primary melanomas. The number of thick melanomas diagnosed in women and the melanoma related mortality in women both showed a downward trend. Alternative approaches seem to be needed to achieve a similar result in men.

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Randomised controlled trial of cardioprotective diet in patients with recent acute myocardial infarction: results of one year follow up

Ram B Singh, Shanti S Rastogi, Rakesh Verma, B Laxmi, Reema Singh, S Ghosh, Mohammad A Niaz

Abstract

***Objective*—To test whether a fat reduced diet rich in soluble dietary fibre, antioxidant vitamins, and minerals reduces complications and mortality after acute myocardial infarction.**

***Design*—Randomised, single blind, controlled trial.**

***Setting*—Primary and secondary care research centre for patients with myocardial infarction.**

***Subjects*—505 patients with suspected acute myocardial infarction. Those with definite or possible acute myocardial infarction and unstable angina based on World Health Organisation criteria were assigned to diet A (n=204) or diet B (n=202) within 24-48 hours of infarction.**

***Interventions*—Both groups were advised to follow a fat reduced diet. Group A was also advised to eat more fruit, vegetables, nuts, and grain products.**

***Main outcome measures*—Mortality from cardiac disease and other causes. Serum lipid concentrations and compliance with diet.**

***Results*—Blood lipoprotein concentrations and body weight fell significantly in patients in group A compared with those in group B (cholesterol fell by 0·74 mmol/l in group A *v* 0·32 mmol/l in group B, 95% confidence interval of difference 0·14 to 0·70, and weight by 7·1 *v* 3·0 kg, 0·52 to 7·68). The incidence of cardiac events was significantly lower in group A than group B (50 *v* 82 patients, p<0·001). Group A also had lower total mortality (21 *v* 38 died, p<0·01) than group B.**

***Conclusions*—Comprehensive dietary changes in conjunction with weight loss immediately after acute myocardial infarction may modulate blood lipoproteins and significantly reduce complications and mortality after one year.**

Medical Hospital and Research Centre and Collaborating Centre for Research, Moradabad, India
Ram B Singh, *director, cardiovascular research*
Shanti S Rastogi, *consultant*
Rakesh Verma, *consultant*
B Laxmi, *dietitian*
Reema Singh, *dietitian*
S Ghosh, *dietitian*
Mohammad A Niaz, *research associate*

Correspondence to: Dr Ram B Singh, Medical Hospital and Research Centre, Civil Lines, Moradabad-10, UP India.

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Introduction

Epidemiological studies show that diet has a definite correlation with coronary heart disease[1] and that the risks associated with a high fat diet remain even after the occurrence of disease and acute myocardial infarction.[2] There is evidence that hypercholesterolaemia can inhibit the secretion of endothelial dependent relaxant factor[3] and predisposes to thrombosis and atherosclerosis.[4] Reduction in blood lipid concentration has been shown to be associated with a significant decrease in the rate of non-fatal infarctions.[5-8] Recently, patients having an increased intake of fish after acute myocardial infarction were shown to have a 29% decrease in all cause mortality compared with the control group after two years' follow up.[9] There is consistent evidence that common Indian foods, such as onion; garlic; guava; star gooseberry; fenugreek seeds; mushrooms; black, red, and Bengal grams; trichosanthes; bitter gourd; soya beans; ground nut, soya bean, and sunflower oils; and almonds and walnuts can modulate blood concentrations of lipids and glucose and fibrinolytic activity leading to reductions in atherosclerosis.[10-18] The clinical effects of diet rich in these foods may be the same as that of taking 180 mg aspirin daily.[19] We have previously shown that a diet rich in fibre, antioxidant vitamins, and minerals given to patients with acute myocardial infarction significantly reduced cardiovascular events over six weeks.[20] We report the results of a one year follow up of patients in this experiment.

Patients and methods

Details of methods, baseline findings, and design of the study have been described.[20] In brief, all patients admitted to our centre with a clinical diagnosis of suspected myocardial infarction (n=505) within the past 24 hours were considered for the study. Diagnosis of acute myocardial infarction was based on World Health Organisation criteria.[21] Patients were included if they had acute myocardial infarction, possible acute myocardial infarction, or unstable angina pectoris. Exclusion criteria were disliking the intervention