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# Increasing mortality from malignant melanoma among women in Northern Ireland

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## SUMMARY

*Deaths from malignant melanoma in each part of the British Isles between 1969 and 1984 have been examined. There has been a substantial increase of deaths among women in each part, and an increase of similar magnitude among men in all areas except Northern Ireland. It is suggested that this difference requires further study. The increasing number of deaths from this disease indicates a need for greater public and professional awareness of this potentially preventable and curable condition.*

## INTRODUCTION

Deaths from malignant melanoma in the United Kingdom have increased substantially in the last 20 years.<sup>1</sup>

A recent report on the incidence of malignant melanoma in Northern Ireland drew attention to an excess of cases among females, and in this review of specimens submitted for pathological examination a female-to-male ratio of almost three-to-one was found.<sup>2</sup> There is a widespread international variation in the female-to-male ratio. British and American studies have reported a female excess,<sup>3,4</sup> but in Belgium, Holland and Scandinavia, in the period 1955–1974, there was a considerable male excess.<sup>3</sup> I have examined deaths from malignant melanoma over a 16-year period in order to see whether mortality has varied over time in Northern Ireland, and to compare this with the experience in the remaining parts of the British Isles.

## METHODS

Deaths from malignant melanoma (ICD-9 Code 172) were extracted from the annual reports of the Registrar-General for Northern Ireland for the years 1969 to 1984. It was not possible to determine the histological type from this source. Corresponding figures for England and Wales, Scotland, and the Republic of Ireland were extracted from *OPCS Mortality statistics*, reports of the Registrar-General for Scotland, and *Reports on vital statistics* from the Central Statistical Office, Dublin. Data for the Republic of Ireland were only analysed for the period 1969 to 1982. The standardised mortality ratios (SMR) were calculated by comparing the annual average number of deaths throughout the period with the age-specific death rates for England and Wales during 1976, the mid-point of

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the period, related to the population estimate for Northern Ireland in that year. The variation of deaths over time were examined by plotting a scattergram and by regression analysis, and the significance of the regression equation was examined by analysis of variance.

## RESULTS

One hundred and twenty men and 176 women died from malignant melanoma in Northern Ireland during the period studied. Deaths among males were slightly less common and among females were significantly so in Northern Ireland as compared with England and Wales. The SMR is  $0.90 \pm 0.16$  for males and  $0.84 \pm 0.12$  for females (95% confidence intervals). (British Isles = 1.00).

There was no significant trend of deaths among males ( $F = 0.083$ , 14 df). There was a significant increase in female deaths throughout the period ( $F = 8.09$ , 14 df,  $p < 0.05$ ). The regression coefficient is 0.605. The trend represented an increase of 173% or from approximately 6 to 16 deaths per year among females while male deaths remained constant at about eight per year.

When analysed by ten-year age groups, there was no significant difference between the age at death of males and females (Chi squared = 7.43, 14 df).

There was an increase in deaths from melanoma among females in each part of the British Isles, but the increase is greatest in Northern Ireland. This is the only part of the British Isles in which there was not a significant increase in male deaths, and is the only one in which there was a significant difference between the trend of deaths among males and females ( $t = 2.25$ ,  $p < 0.05$ ) (Table).

TABLE

*Percentage increase in deaths from malignant melanoma in the British Isles 1969–1984*

|                      | <i>Male<br/>percentage<br/>increase<br/>1969–84</i> | <i>Female<br/>percentage<br/>increase<br/>1969–84</i> | <i>Ratio of<br/>female-to-male<br/>deaths</i> |
|----------------------|---|---|---|
| Northern Ireland     | 8% NS<br>(n = 120)                                  | 173% $p < 0.05$<br>(n = 176)                          | 1.47  |
| England and Wales    | 96% $p < 0.001$<br>(n = 5203)                       | 70% $p < 0.001$<br>(n = 6580)                         | 1.26  |
| Scotland             | 56% $p < 0.05$<br>(n = 458)                         | 49% $p < 0.01$<br>(n = 703)                           | 1.53  |
| Republic of Ireland* | 100% $p < 0.05$<br>(n = 188)                        | 101% $p < 0.05$<br>(n = 266)                          | 1.41  |

Increases have been calculated from the equations of the trends.

Sources: Annual reports of the Registrar-General for Northern Ireland, OPCS *Mortality statistics*, Reports of the Registrar-General for Scotland, and *Reports on vital statistics* from the Central Statistical Office, Dublin.

\* 1969–1982 only.

## DISCUSSION

There has been a rapid rise in the incidence of malignant melanoma among people of Northern European descent in many parts of the world.<sup>5</sup> Total mortality in the British Isles has almost doubled since 1969 and elsewhere: a report from Sweden documented an increase of 7% in both sexes in the period 1959–68.<sup>5</sup> The relationship between lentigo malignant melanoma and ultra-violet light is well recognised, although the association with superficial spreading melanoma and nodular melanoma is less well established.

People of Celtic descent may have a genetic predisposition and studies from Australia<sup>6</sup> and the United States<sup>7</sup> have found that the incidence is significantly higher among those with names suggesting Irish or Scottish ancestry.

In Northern Ireland there is a marked difference in deaths from melanoma in males and females. As it is not necessarily a fatal condition, this may reflect either a difference in incidence or in prognosis. In Gordon and Lowry's comprehensive study of the incidence of melanoma in Northern Ireland in 1974–78 there were 170 females and 61 males.<sup>2</sup> During the same period there were 28 male and 49 female deaths. This suggests a higher case fatality rate among men, which is consistent with the observation that they have a higher proportion of thicker, and therefore more advanced, lesions among biopsies.<sup>2</sup> A higher male case fatality has also been found in England and Wales.<sup>3</sup> Taken with the evidence of increasing mortality, this suggests that the rise in incidence in females in the same population may be very much greater. Walsh and Bharucha<sup>8</sup> in their study of samples submitted for histological examination in 1930, 1955 and 1980, found that the female-to-male ratio in their sample had increased from 1.5:1 in 1955 to 2.3:1 in 1980. It would seem that melanomas are much more common in women but are also likely to be diagnosed earlier.

The reason for the absence of an increase in male deaths in Northern Ireland is uncertain, especially since it is at variance with findings from other parts of the British Isles. It is possible that it may be related to differences in behaviour of male and female holidaymakers from Northern Ireland. A case control study would be useful to examine this hypothesis further. A further possibility is incorrect certification of the cause of death. Although considerable inaccuracies in death certification have been found,<sup>9</sup> a large study of 9,501 deaths<sup>10</sup> comparing clinicians' diagnoses and post-mortem findings established substantial agreement in deaths from many types of neoplasms. The disagreements were more likely to occur in conditions which tend to present with secondary spread, and in which the primary site may be difficult to locate, or among neoplasms which are recognised to present occasionally with non-metastatic complications, such as bronchial neoplasms. It would seem reasonable to suggest that neoplasms of skin would be less likely to be misdiagnosed in comparison with neoplasms of other sites. It is difficult to see how misdiagnosis could consistently and systematically affect one sex to a greater degree than the other over a 16-year period.

Unfortunately, cancer registration in Northern Ireland is incomplete and, when examined in 1983, it was found to have included less than 50% of skin malignancies identified from laboratory records. Coverage of the Province is variable with under-representation of the western part of the Province.<sup>11</sup> It is hoped that improvements in the register will make it possible to investigate future trends.

The observation of lower overall mortality in Northern Ireland as compared with other parts of the United Kingdom is consistent with studies of incidence of

melanoma based on pathological specimens which have reported an annual incidence in Northern Ireland of 3.12/100,000 population<sup>2</sup> compared with 5.1/100,000 in Scotland.<sup>4</sup> The reasons for this are uncertain and may be related to differences in foreign travel. The expenditure on holidays by Northern Ireland residents is one of the lowest in the United Kingdom and is substantially lower than expenditure by residents of Scotland.<sup>12</sup>

Increasing mortality from melanoma has been actively confronted in several countries. Intensive public health campaigns in Queensland<sup>13</sup> and in Scotland<sup>14</sup> have increased both public awareness and the number of cases that are diagnosed early. Where they are still relatively uncommon they may often be missed by doctors and only recognised at a late stage.<sup>15</sup> Walsh and Bharucha<sup>8</sup> have shown that, although there was some improvement between 1955 and 1980 among the samples in their study, by 1980 50% of lesions involved the reticular dermis or subcutaneous fat, and there had been no increase in the percentage which were confined to the epidermal layer.

Leaflets giving advice on exposure to the sun are now being distributed with inclusive tour tickets through travel agents in Northern Ireland. The leaflets contain advice on the use of sunscreens and recognition of malignant melanomas. This should increase knowledge of the risk from melanoma, and promote earlier detection. There is a need for greater public and professional awareness of this potentially preventable and curable condition.

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