

Improved Malignant Melanoma Prognosis at a Consultant-Delivered Multidisciplinary Pigmented Lesion Clinic in Cork

S Field¹, S Deady², J Fitzgibbon³, M Murphy³, H Comber²

¹Dermatology Department, South Infirmity-Victoria University Hospital, Old Blackrock Road, Cork

²National Cancer Registry, Cork

³Histopathology Department, Mercy University Hospital, Grenville Place, Cork

Abstract

Early detection and excision is the only effective treatment for malignant melanoma. To assess the effect of a consultant-delivered, rapid-access pigmented lesion clinic (PLC) established at the South Infirmity-Victoria University Hospital (SIVUH), we analyzed melanoma tumour-stage prior to (1998-2002) and after (2003-2007) the advent of the PLC. Patients attending SIVUH had a greater proportion of early-stage tumours (65.3%) compared to the rest of Cork (51.2%), County Cork as a whole (56.7%) and all of Ireland (57.4%). The proportion of SIVUH males with early-stage tumours was statistically significantly higher than the rest of County Cork ($\chi^2 = 11.23$, $P < 0.05$). The proportion of patients > 50 y with early-stage tumours was also statistically significantly higher than the rest of County Cork ($\chi^2 = 18.88$, $P < 0.05$), the whole of County Cork ($\chi^2 = 7.84$, $P < 0.05$) and all of Ireland ($\chi^2 = 9.67$, $P < 0.05$). We believe that the early detection and improved prognosis of Cork melanoma patients is at least partly due to the PLC.

Introduction

Malignant melanoma is increasing world wide, particularly in countries with skin type and climate akin to Ireland.¹⁻³ It has long been established that Breslow thickness is the best indicator of prognosis. Thinner melanomas are associated with substantially higher 5 year survival rates (< 1 mm 90-95% 5 year survival) than thicker melanomas (> 4 mm 45-67% 5 year survival) so earlier detection and treatment should reduce mortality risk.⁴ Pigmented lesion clinics (PLC) with a rapid access policy of two weeks from

referral to review were set up in the UK from the late 1980's. This structure of referral and review aimed to reduce Breslow thickness at diagnosis and to improve the overall management of melanoma. To date there is little evidence to support the benefit of PLCs in reducing Breslow thickness and therefore improving prognosis.⁵⁻⁷ The 2-week rule of referral was introduced for a number of cancers in the U.K. in 1997 and for melanoma in 2000 but again studies have not yet demonstrated a benefit.⁸ Our PLC was established in 2003. The aim of this study was to determine if

there had been a consequent reduction in melanoma tumour stage in Cork.

Methods

The PLC set up in 2003 is a multidisciplinary clinic based at the South Infirmar-y-Victoria University Hospital (SIVUH) in Cork city. It involves collaboration between the departments of Dermatology, Plastic Surgery, General Surgery, and Radiology at the hospital and the Department of Histopathology at the Mercy University Hospital. The PLC is delivered by a consultant dermatologist side-by-side with the plastic surgery team. Necessary excisions are performed where possible on the same day or within one week. Patients with benign lesions are reassured and discharged. We aim to see patients within two weeks of General Practitioner (GP) referral. Local GPs are reminded of the clinic by letter each spring. We publicised the clinic including photo-shoots with local sports stars for local and national newspapers.

Data for melanoma incidence and tumour stage for the years 1998 through 2007 were provided by the National Cancer Registry. For the purpose of the analysis, tumours were grouped into "early" (T1, T2; Breslow ≤ 1.5mm) and "late" stage (T3, T4; Breslow > 1.5mm) by means of the tumour ("T") stage alone. This is because while a large proportion of tumours have complete "T" stage information, fewer tumours have corresponding information on nodal ("N") or metastatic ("M") status. The proportion of melanomas with complete T staging represented 82% of all tumours in Ireland and 88.5% in Cork County (89.4% in patients attending SIVUH and 87.9% in non SIVUH patients). Patients diagnosed with melanoma were compared based on geographical location. For those patients diagnosed in Cork, we analyzed 2 groups – those diagnosed in SIVUH and those diagnosed elsewhere in Cork (non-SIVUH). Two time periods were compared corresponding to the five year periods before (1998-2002) and after (2003-2007) the PLC was established. Pairwise comparisons were carried out by means of Chi squared tests⁹ to examine the distribution of and proportions of sexes, age groups and tumour stage between the two time periods and patient groups (SIVUH and non SIVUH). Logistic regression analysis was also performed to assess the effect of sex and age distribution of patients on tumour stage at diagnosis.

Results

Overall there has been a large rise in the number of melanomas diagnosed comparing pre PLC and post PLC time periods in SIVUH, Cork County and nationally. In Ireland, 2304 melanomas were diagnosed between 1998-2002 while 3031 were diagnosed between 2003-2007, representing a 32% increase. In County Cork 330 melanomas were diagnosed between 1998-2002 and 469 between 2003-2007, a 42% increase. In SIVUH 86 melanomas were diagnosed between 1998-2002 while 216 were diagnosed between 2003-2007. This represents a 151% increase in the number of melanomas excised in SIVUH. Just over one quarter of all cases of melanoma treated in Cork between

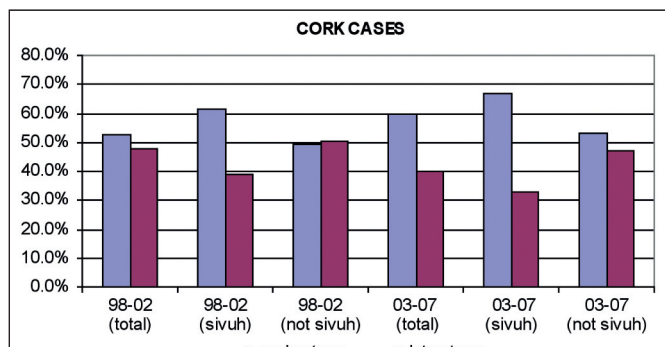


Figure 1: Changes in the proportion of early and late stage tumours in Cork residents between 98-02 and 03-07.

Table 1: Proportion of early and late stage tumours diagnosed between 1998 and 2007 overall between males and females and between age groups

	cases	%	% early stage	% late stage
Cork				
females	425	60.1%	60.0%	40.0%
males	282	39.9%	51.8%	48.2%
total	707			
Cork-SIVUH				
females	171	61.7%	65.5%	34.5%
males	106	38.3%	65.1%	34.9%
total	277			
Cork-non SIVUH				
females	254	59.1%	56.3%	43.7%
males	176	40.9%	43.8%	56.3%
total	430			
Ireland				
females	2628	60.1%	61.4%	38.6%
males	1745	39.9%	51.3%	48.7%
total	4373			
	cases	%	% early stage	% late stage
Cork				
0-49 years	221	31.3%	68.8%	31.2%
50-69 years	244	34.5%	60.7%	39.3%
70+ years	242	34.2%	41.7%	58.3%
all ages	707		56.7%	43.3%
Cork-SIVUH				
0-49 years	78	28.2%	70.5%	29.5%
50-69 years	105	37.9%	69.5%	30.5%
70+ years	94	33.9%	56.4%	43.6%
all ages	277		65.3%	34.7%
Cork-non SIVUH				
0-49 years	143	33.3%	67.8%	32.2%
50-69 years	139	32.3%	54.0%	46.0%
70+ years	148	34.4%	32.4%	67.6%
all ages	430		51.2%	48.8%
Ireland				
0-49 years	1489	34.0%	68.5%	31.5%
50-69 years	1559	35.7%	58.4%	41.6%
70+ years	1325	30.3%	43.7%	56.3%
all ages	4373		57.4%	42.6%

1998-2002 attended SIVUH; this rose to 46% between 2003-2007 and the proportion seen in SIVUH continues to increase; 51% of all melanomas in 2007 in Cork county were diagnosed in SIVUH.

Only patients with complete melanoma T staging were included in further analysis. There was an increase (although not statistically significant, $\chi^2 P > 0.05$) in the proportion of early stage tumours diagnosed in 2003-2007 compared to 1998-2002 in Cork overall, in SIVUH and non-SIVUH patients, and in Ireland overall (Figure 1). This increase in the proportion of early stage tumours between the two time periods was greater in SIVUH patients compared to non-SIVUH although this was not statistically significant. Within the period of 1998-2002 there was a greater proportion of early stage tumours in SIVUH patients compared to non-SIVUH patients but this was not statistically significant. The greater proportion of early stage tumours in SIVUH, however, became statistically significant ($\chi^2 = 7.58$, $P < 0.05$) within the period 2003-2007 corresponding to the period following the set up of the PLC (Figure 1).

Age, sex and tumour stage distribution in SIVUH, Cork overall and nationally has not significantly varied over the study period. Similar proportions of males and females attended SIVUH as seen in non-SIVUH cases, Cork overall and Ireland. In Ireland over the 10 year period studied there was an overall female: male ratio of 3:2 for patients diagnosed with malignant melanoma. Males and older patients tended to have a higher proportion of late staged tumours (Table 1). This was not the case for SIVUH patients. The proportion of early and late stage tumours was similar between the males and females in SIVUH patients. This was as a result of the significantly greater proportion of early stage tumours in SIVUH male patients compared with the non-SIVUH population ($\chi^2 = 11.23$, $P < 0.05$) and was also higher than that for males in

the county overall and Ireland overall. The oldest age group (70+) had the greatest proportion of late stage tumours generally in Cork and Ireland. However the proportion of early stage tumours was statistically significantly higher in patients aged 50 and over in the SIVUH compared to the non-SIVUH patients ($\chi^2 = 18.88$, $P < 0.05$), and between the SIVUH patients and Cork overall ($\chi^2 = 7.84$, $P < 0.05$) and Ireland ($\chi^2 = 9.67$, $P < 0.05$).

To further explore if any changes in the sex and age distribution of the melanoma patients had an influence on the relationship between tumour stage and the time period of diagnosis, a series of logistic regression models were fitted to the data. The positive trend of greater proportions of early stage tumours in 2003-2007 was confirmed (Table 2). Adjusting for patient sex and age improved the fit of the model for SIVUH patients and for Ireland overall although the trend for the non-SIVUH patients did not seem to be affected by any changes in sex or age over time. However, when the model was adjusted for patient attendance at SIVUH a reduction in odds ratio was observed. Although not statistically significant this implies that the movement of patients to SIVUH is contributing to the overall shift towards earlier stage at diagnosis with time observed in the Cork population.

Discussion

A rise in the number of melanomas diagnosed over a 10 year period was observed together with a trend of increasing proportions of early stage tumours diagnosed in Cork residents and Ireland overall. There were greater proportions of early stage tumours diagnosed in SIVUH females and particularly in SIVUH males and patients over the age of 50 years compared to the non SIVUH population, county overall and Ireland. In the fair skinned melanoma incidence is increasing.¹ Studies in Scotland and Australia have shown an increase in melanoma in patients over 60 years.^{2,3} In Scotland this older age group also present with thicker melanomas and therefore have a poorer prognosis.³ Our SIVUH figures suggest that PLC is helping target males and particularly the older age group who frequently present late with thicker melanomas. The higher proportion of early stage tumours in patients diagnosed in Cork but particularly in the SIVUH combined with the movement of patients to SIVUH since establishment of the PLC suggests the establishment of the PLC is having a positive impact on the overall picture of tumour stage in Cork residents.

In the UK a number of dermatology units have looked at the effect of their PLCs but have not shown a reduction in Breslow thickness. Weatherhead et al did a retrospective analysis of their melanoma screening clinic (1997 to end of 2004).⁵ As a result of their PLC the number of new patients seen each year increased by 230%. The proportion of melanomas detected declined. Their experience suggests the PLC resulted in increased number of referrals from GPs but did not reduce Breslow thickness. Mallet et al showed no reduction of Breslow thickness over a 9 year period but suggested the PLC fulfilled a demand from both GPs and patients and allowed centralization of much needed data collection.⁶ Other studies also failed to show reduction in Breslow thickness.¹⁰

Lipsker et al in a French study showed that Breslow thickness has reduced in their Bas-Rhin region of France from 1980 to 1997. They found an increase in incidence of melanomas; this increase was mainly related to an increase in superficial spreading melanoma in both sexes.¹¹ They noted that mortality during their study period did not increase proportional to the increase of melanomas diagnosed suggesting clinically innocuous melanomas, unlikely to cause death were being picked up.¹¹ Melanoma mortality rates are increasing by about 4% for men and 2% for women (age-standardised incidence) since 1990 in Ireland. Incidence rates for both men and women are increasing by 4% since 1994. Osborne et al assessed the interval between referral and review pre and post the introduction of their PLC.

Table 2: Logistic regression analysis illustrating the odds ratio of having an early stage tumour in 2003-2007 compared to 1998-2002 and the effects of patient sex and age

	OR	95% CI
IRELAND	1.14	1.01-1.29
adj for sex	1.16	1.03-1.31
adj for age	1.15	1.02-1.31
adj for sex & age	1.17	1.04-1.33
CORK-SIVUH	1.28	0.75-2.20
adj for sex	1.29	0.75-2.23
adj for age	1.31	0.76-2.26
adj for sex & age	1.32	0.76-2.28
CORK-non SIVUH	1.16	0.80-1.70
adj for sex	1.16	0.80-1.70
adj for age	1.08	0.72-1.61
adj for sex & age	1.08	0.73-1.62
CORK-ali	1.35	1.00-1.82
adj for sex	1.37	1.01-1.85
adj for age	1.34	0.98-1.82
adj for sex & age	1.36	1.00-1.85
adj for sex & age & SIVUH	1.20	0.87-1.65

They believe that PLCs are of value in the diagnosis and treatment of melanoma, but only if they are appropriately utilized by GPs.¹² To help ensure appropriate utilization we attempt to write to local GPs each spring to remind them of the PLC.

We have shown in this study that over a 10 year period there has been a rise in the number of melanomas treated and a drop in the tumour stage at diagnosis in patients treated in Cork County and particularly in patients treated in SIVUH. Our analysis indicates that these changes may be related to the introduction of a consultant delivered multidisciplinary pigmented lesion clinic at the South Infirmary-Victoria University Hospital. The finding of an earlier tumour stage in patients attending the SIVUH hopefully with time will result in a reduction in mortality from malignant melanoma in Cork County.

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Correspondence: S Field
Dermatology Department, South Infirmary-Victoria University Hospital, Old Blackrock Road, Cork
Tel: +353 21 4926330 Fax: +353 21 4926405
Email: sineadfield@hotmail.com

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