

The Changing Epidemiology of Desmoplastic Melanoma

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Desmoplastic melanoma (DM) is regarded as an uncommon form of melanoma that occurs on the head and neck of older people (median age 60–70 years), occurring more often males (1). Few epidemiological studies of pure DM ($\geq 90\%$ uniform desmoplasia) exist, and even fewer have reviewed contemporary DM patients. The most recent study of 119 patients with pure DM, diagnosed during the period 1994 to 2016 in an Australian referral centre, found a median age of 74 years, 67% male, and 66% of DM were on the head and neck (2). Recently we have observed a number of young patients with DM occurring on sites other than the head and neck.

The aims of this study were to investigate the age and anatomical distributions of pure DM among a large series of patients, and to assess whether these distributions had changed over time.

MATERIALS AND METHODS

We identified patients diagnosed with pure DM (defined as a melanoma consisting of S100-positive and HMB-45 negative spindle cells and abundant collagenous stroma with no epithelioid component and little or no junctional component) in the Histopathology Department, Royal Surrey Hospital, Guildford, UK, between 1994 and 2018, and recorded their age, sex, and the site of DM. The study was approved by the institutional ethics committee (IRAS186482).

Statistical analysis

Fisher's exact test was used to assess differences in DM site by sex, by 2 age groups (< 60 ; ≥ 60 years), and by period of diagnosis (1991 to 2004; 2005 to 2018). p -values < 0.05 were considered significant (2-tailed).

RESULTS

A total of 114 patients with DM were identified. Date of birth was missing for 8 and site of lesion for 8 (with over-

lap), leaving 103 patients, with median age at diagnosis 60 years (range 12–94); 45 (44%) males (5 unknown sex). Overall, 52 (50%) of DMs occurred on the head and neck, with similar proportions occurring on the trunk (17%), upper (15%) and lower (17%) limbs (**Table I**). The majority (41, 79%) of head and neck DM were on the face and the remainder on the scalp. Most trunk lesions were on the back ($n=12$, 67%); similar proportions on the upper ($n=9$, 56%) and lower ($n=7$, 44%) arm; while on the lower limb, DM occurred equally on the thigh and foot (each $n=7$, 41%) with fewer on the lower leg ($n=3$, 18%). There was no difference in sites of occurrence between males and females ($p=0.41$). However, the anatomical sites of DM differed significantly ($p<0.001$) according to age (Table I). The main difference was the proportion on the head and neck: 71% ($n=37$) in those ≥ 60 years, but 29% ($n=15$) in those < 60 years. In the younger group, DM occurred equally ($n=12$, 24%) on trunk, upper and lower limbs. A comparison of DM sites in patients diagnosed in the period 1991 to 2004 vs 2005 to 2018 by age, found a shift from upper to lower limb as the predominant site at age < 60 years ($p<0.001$), while at age ≥ 60 years, head and neck was predominant, but less so in the more recent period (65% vs 74% earlier) (Table I). After age 60 years, proportions of DM on the trunk and lower limb each increased to 16% (from 4% and 0%) ($p<0.002$).

DISCUSSION

These findings confirm our impression that DM (here “pure DM”) is no longer a disease seen almost exclusively on severely sun-damaged skin, usually on the head and neck, in elderly patients. In over 100 patients with DM diagnosed at a single centre, this study found that DM occurs with similar frequency on the head and neck

Table I. Anatomical site of desmoplastic melanoma overall and according to age group and period of diagnosis

Site	<60 years					≥ 60 years				
	All, $n=103$ n (%)	Total ^a , $n=51$ n (%)	1991–2004, $n=27$ n (%)	2005–2018, $n=25$ n (%)	p -value ^b	Total ^a , $n=52$ n (%)	1991–2004, $n=23$ n (%)	2005–2018, $n=31$ n (%)	p -value ^b	
Head and neck	52 (50)	15 (29)	8 (30)	7 (28)	<0.001	37 (71)	17 (74)	20 (65)	0.002	
Trunk	18 (17)	12 (24)	5 (19)	7 (28)		6 (12)	1 (4)	5 (16)		
Upper limb	16 (15)	12 (24)	10 (37)	2 (8)		4 (8)	3 (13)	1 (3)		
Lower limb	17 (17)	12 (24)	3 (11)	9 (36)		5 (10)	0 (0)	5 (16)		

^aFisher's exact test comparing 2 age groups $p<0.001$. ^bFisher's exact test comparing frequency distributions of desmoplastic melanoma counts between the 2 periods of diagnosis across all anatomical sites.

and elsewhere, with no significant difference between the sexes. Earlier studies of pure DM that have noted a predominance of pure DM on the head and neck (2, 4, 5) have reported proportions of intermediate magnitude on this site, ranging from 66% (2) to 33% (3). Other studies found almost no DM on the lower limb (3, 4), unlike the results of the current study from 2005 onwards. Previous studies assessed the ages of patients with DM and reported proportions aged <60 years of 33% (4) and 42% (3), but none investigated how the site of DM varies with patient age. The current study found substantial and significant differences in sites of DM in younger vs older patients, with only approximately 30% of those <60 years affected on the head and neck, compared with approximately 70% of those aged ≥ 60 years. In comparing non-head and neck sites of DM in patients diagnosed from the mid-2000s to those diagnosed in the 1990s, this study further found a shift away from the upper limb in both age groups.

In conclusion, the epidemiology of DM has evolved, even over the last 3 decades, such that patients aged <60 years are affected almost as often as older patients, and those <60 years are affected as much on the trunk and lower limb as on the head and neck. The predominant site in those aged ≥ 60 years remains the head and neck, but the trunk and lower limb now account for one-third of DM in older patients. These shifts in site and age dist-

ributions of pure DM are probably related to changing patterns of sun exposure; a hypothesis that can be tested in future studies.

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