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The burden of cutaneous melanoma and status of preventive measures in Central and South America☆

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ABSTRACT

Rationale and objective: Very little is known about the burden of cutaneous melanoma in Central and South America, despite the existence of a reasonable amount of population-based data. We present data on melanoma incidence calculated in a standardized way for Central and South America, as well as an overview of primary and secondary prevention issues in the region.
Methods: Cancer registry data on all incident cases reported in the different registries present in Central and South America were combined to provide registry-based country estimates of age-standardized, sex-specific cutaneous melanoma incidence overall, and by histological subtype and anatomical site. A literature search provided additional information.
Results: Age-standardized incidence rates were between 1 and 5 per 100,000 and tended to be higher further away from the equator. Cutaneous melanomas of the acral type, mostly occurring on the lower limbs, are a distinguishing feature of melanoma in Central and South America in comparison with high-incidence areas. Several preventive measures, both primary and secondary, are in place, albeit largely without evaluation.
Conclusion: Due to incomplete registration and different registration practices, reliable and comparable data on melanoma were difficult to obtain; thus it is likely that the true burden of melanoma in Central and South America has been underestimated. The different characteristics of the cutaneous melanoma patient population in terms of anatomical site and histological type distribution imply a need for adapted primary and secondary prevention measures. The generally high ambient ultraviolet radiation levels require sufficient sun protection measures.

1. Introduction

Worldwide, malignant melanoma accounts for less than 2% of total cancer cases (excluding non-melanoma skin cancers), and although it is not the most common type of skin cancer, it is the most fatal and causes the largest proportion of skin cancer deaths.

Worldwide, the incidence of melanoma has been increasing steadily and rapidly [1]. Estimates from GLOBOCAN 2012 show the global age-standardized incidence rates to be 3.0, varying from 0.3 in South and Central Asia to 35.1 in Australia and New Zealand, with estimates for Central America (1.6) and South America (2.5) being close to the global estimate [2]. Poorer survival is generally reported for melanomas occurring in low- and middle-income countries compared to high-income countries [3].

There are several histological subtypes of melanoma which differ in frequency of occurrence by anatomical site, and potentially by ethnic characteristics of the population [4]. Worldwide, the most frequently occurring histological pattern is a superficial spreading melanoma, representing the majority (70–75%) of all melanomas in high-incidence areas; this is followed

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Table 1
Countries included in the analysis of time trends.

Country	Name of registries included	Period	% of the population covered
Argentina	Bahia Blanca	1993–2007	0.8
Brazil	Aracaju, Fortaleza, Goiania, Sao Paulo	1997–2006	8.0
Chile	Valdivia	1993–2008	2.2
Costa Rica	National registry	1985–2007	100.0

by nodular melanomas. Lentigo maligna melanomas are almost exclusively found on sun-damaged skin of the head and neck, mainly amongst elderly persons. Acral lentiginous melanoma (ALM) is a relatively rare subtype (worldwide less than 10% of all melanomas), and is found on the palms of the hands, soles of the feet, and nail beds. Clinically, they often present late and have a poorer prognosis than other subtypes [4].

The major external cause of melanoma is exposure to ultraviolet radiation (UVR) [5], which explains why the incidence of melanoma is much higher in white than in more pigmented populations [6]; pigmentations offers some degree of protection against damage by UVR [7]. A few studies on melanoma across the South American continent have shown that being of European ancestry was strongly related to melanoma risk [8–11]. Melanoma incidence and mortality was very high in populations with a high proportion of white-skinned people in Brazil [12,13]. The relationship with UVR is complex and depends on individual sun-sensitivity reflected in phenotypic characteristics such as fair and red hair, fair skin, light-colored eyes and the presence of melanocytic nevi (moles) [14–19].

In Latin America ALM is an important type of melanoma, but it is unclear whether or not it is related to UV exposure. Several case reports and case–control studies suggest that trauma (defined as deep penetrative injuries, burns, cuts or thorn pricks) is a risk factor for melanomas occurring at acral sites or specifically for ALM [20–22]. Benign nevi on the soles or toes have also been associated with an increased risk of hand and foot melanomas and/or ALM [22].

In this paper we aim to provide a clearer picture of melanoma in Central and South America, including information on incidence by anatomical site and histological subtype and mortality, and we discuss national initiatives for primary or secondary prevention of skin cancer that are in place in the various countries of the region.

2. Methods

We included only cutaneous melanomas for this study. Ocular and mucosal melanomas are very rare cancers which constitute separate entities in the third revision of the International Classification of Diseases for Oncology (ICD-O3) and they are not considered in this paper (uveal or ocular melanomas ICD-O3C69.3 and C69.4; mucosal melanomas, all cancer sites except C7–C8, C22, C25, C37–C50, C54, C55.9, C56, C57.0–57.9, C58.9, C60.0–C66.9, C68.1, C68.9, C69.1–C80.9).

The data sources and methods are described in detail in another article in this issue. In brief, we obtained regional- and national-level incidence data from 48 population-based cancer registries in 13 countries and cancer deaths from the World Health Organization mortality database for 18 countries. We estimated age-standardized incidence (ASR) and mortality (ASMR) rates per 100,000 person-years using the direct method and the world standard population [23]. We estimated national ASRs by aggregating the data from the available cancer registries using a weighted average of local rates. To describe incidence and mortality time trends, we calculated the estimated annual percent

Table 2
Incidence and mortality rates (per 100,000) of melanoma among males, all ages.

		Incidence				Mortality[a]				
	Period	Cases	Crude Rate	ASR (W)	Rank[c]	Deaths	Crude Rate	ASR (W)	Rank ‡	M:I[a]
Argentina[b]	2003–2007	382	3.1	3.1	18	1271	1.3	1.2	17	0.43
Belize	2003–2007	.			.	1	0.1	0.4	15	
Bolivia[b]	2011	8	0.6	0.7	13	.			.	
Brazil[b]	2003–2007	2194	3.9	4.9	15	3303	0.7	0.8	16	0.18
Chile[b]	2003–2007	60	2.6	2.6	19	419	1.0	1.0	18	0.41
Colombia[b]	2003–2007	253	2.8	3.1	15	479	0.5	0.6	17	0.16
Costa Rica	1985–1989	84	1.2	1.7	19	29	0.4	0.6	11	0.34
	2003–2007	234	2.2	2.5	16	89	0.8	0.9	17	0.38
Cuba[b]	2004–2007	39	2.4	1.6	19	141	0.6	0.4	18	0.26
Ecuador[b]	2003–2007	125	2.6	3.2	15	119	0.4	0.4	17	0.13
El Salvador	1999–2003	47	0.4	0.4	14	4	0.0	0.0	19	0.08
French Guyana[b]	2003–2008	13	2.6	3.9	16	–			–	
Guatemala	2003–2007	–			–	95	0.3	0.5	14	
Mexico[b]	2006–2010	301	1.8	2.1	14	1258	0.5	0.7	18	0.26
Nicaragua	2003–2007	–			–	14	0.1	0.2	19	
Panama	2003–2007	–			–	39	0.5	0.5	16	
Paraguay	2003–2007	–			–	65	0.4	0.7	14	
Peru[b]	2001–2005	184	2.0	2.2	17	240	0.4	0.5	16	0.18
Suriname	2003–2007	–			–	3	0.2	0.3	17	
Uruguay	2005–2007	301	6.3	4.6	16	83	1.7	1.2	17	0.27
Venezuela	2003–2007	–			–	251	0.4	0.5	17	

ASR (W), age-standardized (World population) rate per 100,000; M:I, mortality-to-incidence ratio.
[a] National mortality.
[b] Incidence rates were estimated using data from regional cancer registries.
[c] Rank across cancer types, based on highest ASR excluding: all sites but C44 and all sites.