Annals of Hematology & Oncology

Open Access

Austin Publishing Group

Rapid Communication

Melanoma in Tasmania, Australia: 1981 to 2016

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Received: September 17, 2019; **Accepted:** November 19, 2019; **Published:** November 26, 2019

Abstract

Introduction: There is controversy as to whether or not the incidence of melanoma is decreasing in the Australian population because the racial composition of the Australian population is changing at a rapid rate with many people at low risk for the disease settling in Australia. Not many immigrants settle in the island state of Tasmania and the population is overwhelmingly of European ancestry. In this article the incidence of melanoma in Tasmanians is calculated for the Census years between 1981 and 2016.

Materials and Methods: Data on the number of invasive melanomas was obtained from the State Cancer Registry. Data on the Tasmanian population were obtained from the Australian Bureau of Statistics.

Results: Between 1981 and 2016 the number of invasive melanomas removed from was susceptible. Tasmanians increased almost five-fold. The population increased by 23%. In 1981, 99% of the population was susceptible to melanoma. In 2016, 96% was susceptible. The Age Standardized Rate (ASR) of melanoma increased by almost three fold while the Crude Rate (CR) increased by almost four fold.

Conclusion: In the most homogeneous population of Australians, the incidence of melanoma is continuing to increase despite public health campaigns running over the entire study period. In a homogeneous population, ASR and CR for melanoma show similar trends. In a changing population with a large number of people not susceptible to melanoma, ASR cannot be used to determine trends.

Introduction

The number of invasive melanomas removed from Australians has quadrupled between 1982, when data were first recorded, and 2016 [1]. Over the same time the population increased by 65% [2]. Despite the rate of increase in melanomas being far greater than the rate of population increase, the Age Standardized Rate (ASR) of melanomas has stabilized since 2001 [1]. Australian authors have claimed that the stabilization in the ASR is attributed to public health campaigns that have being running since 1980 and that the incidence of melanoma is now decreasing in young Australians [3]. The authors failed to mention that the Australian population has greatly changed since 1981 with a large number of dark skinned people, at low risk for melanoma, settling in Australia. If adjustments are made for the population change, and the incidence is calculated for the susceptible population, the incidence has not stabilized but is increasing by 2% a year [4].

The magnitude of the change can be seen by the great increase in the number of people born in Asia who were living in Australia. In the 1981 Census, 1.7% of Australians were born in Asia but this had increased to 10.4% in the 2016 Census [2]. Such a big increase in people at low risk for the disease must lower the incidence of melanoma in the entire population. If immigration had no influence on the incidence of melanoma but public health campaigns had been beneficial, the incidence of melanoma should be decreasing in an area that has had a slight change in its racial composition. The island state of Tasmania is the one such area in Australia. Tasmania is the most southern Australian state and lies in the temperate zone of Australia between 41° and 44° south. The majority of the population lives at 43° south (Table 1).

Tasmania has the smallest Australian population and it also the most homogeneous population. In the 1981 Census, 3242 people out of a total population of 418,955 (.08%) were born in regions where the population has a low risk for melanoma. These regions are Asia, the Pacific Islands, The Middle East, and Sub-Saharan Africa [5]. In the 2016 Census, the number of people born in these regions had increased to 20,740 out of a population of 517,510 (4%). In 2016, 96% of the Tasmanian population had European ancestry, a slight decrease from 99% in the 1981 Census. In contrast, in 2016 in the rest of Australia, 14.8%% of the population had migrated from low risk regions, a marked increase 4% in the 1981 Census.

In this article the incidence of invasive melanoma is determined for the Tasmanian population between the Censuses of 1981 and 2016.

Materials and Methods

Data concerning invasive melanomas was obtained from the Tasmanian Cancer Registry. Pathologists in Australia are required by law to notify their State Cancer Registry of all cases of invasive melanoma [6].

Data concerning the Tasmanian population were obtained from the Australian Bureau of Statistics [2]. A Census is held in Australia every five years and people are obliged by law to answer the questions asked. The country of birth of the resident is asked but the race of the resident was not asked in most Censuses. Data concerning births

Citation: D Czarnecki. Melanoma in Tasmania, Australia: 1981 to 2016. Ann Hematol Oncol. 2019; 6(10): 1272.

Table 1: Invasive Melanoma in Tasmania 1981 to 2016.

Census year	Total population	Susceptible population	Melanomas removed	ASR Total population	CR Total population	CR susceptible population
1981	418955	414990	69	17.9	16.5	16.6
1986	436354	431602	87	22.1	19.9	20.2
1991	452895	446540	143	33.9	31.4	32
1996	475610	468769	189	41.3	39.7	40.3
2001	473670	465617	209	42.7	44.1	44.9
2006	489310	477980	251	47.2	52.3	52.5
2011	511480	496376	267	44.6	42.2	53.8
2016	517510	495271	334	52	65.5	67.4

ASR – Age Standardized Rate per 100,000 (2001 Australian population)
CR –Crude Rate per 100,000 population

were obtained from the ABS [7].

Results

The results are set out in the table. Between 1981 and 2016 the number of invasive melanomas increased by 384% (from 69 to 334). The average increase in melanomas was 11% a year. Over the same time the total population increased by 23.5%, an average of 0.6% a year.

The Aged Standardized Rate (ASR) of invasive melanoma for the entire population increased by 190%, an average of 5.4% a year. The ASR for the susceptible population was not calculated. The Crude Rate (CR) or melanoma for the entire population showed a similar trend as for the ASR but the increase was higher. Over the 35 years the CR increased by 297%, an average of 8.5% a year.

Discussion

The population of Tasmania is the most homogeneous in Australia and is ideal to study trends in melanoma incidence. The data show that the incidence of melanoma has significantly increased over 35 years despite the fact that public health campaigns warning against sun exposure have been running since 1980. The ASR and CR for the entire population show the same trend as does the CR for the susceptible population but the latter shows a higher rate of increase.

Age Standardized Rates are calculated because cancer is more common in the elderly and if a population ages, the incidence of cancer will rise. With regard to melanoma, the increasing incidence with age is greater in white people. Data from the United States show that melanoma incidence in black Americans is one thirtieth of that in whites. The incidence of melanoma increases with age in both races but even in the elderly melanoma incidence in blacks is one seventh that of whites [8].

The incidence of melanoma is low in Asians even those living in tropical Singapore. A recent study found an incidence of 3 per million. This was 250 times higher than the incidence of melanoma in whites living in tropical Australia. The number of melanomas removed was small and no trend with regard to age could be determined. The incidence of melanoma in China and India is less than 1 in a million, and the numbers are too small to determine any trend with increasing age [5]. The risk of developing a melanoma does not increase when Asians migrate to Australia.

With a disease like melanoma, that has marked racial differences in susceptibility across all age groups, the ASR also has to be adjusted for the racial composition of each age group. This has not been done in Australia hence the misleading reports that melanoma incidence is decreasing Australia [3]. As a result of immigration the Australian population is not homogeneous and while ASR for melanoma in the entire Australian population shows a decreasing trend the CR for the susceptible population shows an increasing trend [4]. The data from Tasmania show that in a fairly homogenous population ASR does not give this misleading contradiction of trends in melanoma.

The increase in melanoma in Tasmania is real and not due to the ageing population. Most melanomas are removed from people over the age of 55 years. Between 1981 and 2016 the percentage of the population aged 55 or more increased by 110%, from 81,297 to 170,905. The number of invasive melanomas removed in this age group increased by 384%, from 69 to 334.

Conclusion

The data from a relatively homogeneous population in Tasmania show that the number of invasive melanomas removed increased nearly five-fold over 35 years despite public health campaigns during this period warning the entire population of the dangers of sun exposure. Advocates of the Public Health campaigns claim a significant beneficial effect on the incidence of melanoma in Australia but this is not borne out by the data if proper account is taken of the changing makeup of the Australian population as a result of immigration of people at low risk of the disease.

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