The Tale of Malignant Melanoma; a Tertiary Hospital Experience in South-South, Nigeria

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Abstract

Introduction*: Malignant melanomas are highly aggressive and invasive tumours with enormous metastatic potentials. The incidence is on the increase globally with resultant increase in its health burden (clinical and economical). It is therefore imperative that periodic data collection and analysis is necessary, to decipher the trend in relation to the findings of previous published study/studies. This will in no small measure give an insight on the health burden at that material point in time and also provide an avenue to plan and cushion the effect(s) that may arise from this burden. The aim of this study is therefore to elucidate the frequency, age and sex distribution of Malignant Melanoma in the University of Benin Teaching Hospital, Benin City Edo State, Nigeria.*

Methodology*: A 10 year study that spanned from 1st of January, 2004 to 31st of December, 2013. The targets were all cases of malignant melanoma diagnosed during the period of study under review. Data obtained were analysed using the Statistical Package for Social Science version 16 (V. 16). Ethical clearance was duly obtained from the ethical review committee of the University of Benin Teaching Hospital.*

Results*: Malignant melanomas accounted for 27 cases of the 187 cases of malignant skin tumours present during the study period.*

Their mean age was 52.96±22.04years (males =58.83years; females=48.27years), their age range was 3 – 111 years with a peak in the 7th decade. The male to female ratio was 1:1.3. The lower limb was the most frequent site of the tumour. Most cases were advanced stages of the disease (Clarks's level 4 and 5).

Conclusion*: It accounts for 14% of malignant skin tumours. The females were slightly more affected than the males. The mean age in females was a decade less than that of their male counterpart. Their age range spanned from the 1st to the 12th decade. Most cases present late with advance disease.*

Keywords*: Malignant melanoma, health burden, tale, prevalence, peak age, mean age, male: female ratio*

I. INTRODUCTION

Malignant melanoma is a common primary malignant skin tumour.[1, 2] Melanomas are malignant tumours characterized by a highly invasive and metastatic potential.[3] The importance of melanoma, both clinically and economically is on the increase as a result of its increasing incidence.[4]

Malignant melanoma is the 19th most common cancer worldwide.[5] It is the third most common cancer in both males and females in Australia/New Zealand.[5]

The age standardized incidence rate for malignant melanoma for the world population has been reported as 3.0/100,000. It was reported as 35.1/100,000 in Australia/New Zealand where it accounts for the highest age standardized incidence rates in the world.[6] In Europe, the age standardized incidence rate/100,000 was reported as 0.9 to 20.3.[6] While the highest rate was reported in Switzerland (20.3/100,000), the lowest rate was in Albania (0.9/100,000).[6] In Northern America, the age standardized incidence rate/100,000 in the United States and Canada were 14.9 and 9.6 respectively. In South America, the age standardized incidence rate/100,000 population was documented as 0.0 to 4.1.[6] Uruguay and Guyana have the highest (4.1/100,000) and lowest (0.0/100,000) standardized incidence rates in Southern America.[6] In Asia, the age standardized incidence rate/100,000 is 0.0 to 11.4.[22] Maldives in South-Central Asia and Israel in Western Asia have the lowest (0.0/100,000) and highest (11.4/100,000) age standardized incidence rates in Asia.[6] In Africa, the age standardized incidence rate/100,000 is 0.0 to 4.5 with the lowest and highest limits found in Djibouti in Eastern Africa and Southern African Republic in Southern Africa respectively.[6] In Western Africa, the highest and lowest age standardized incidence rate/100,000 of 1.3 and 0.4 were found in Guinea and Cape Verde respectively.[6] In Nigeria, Ghana, Benin Republic, Liberia and Senegal, the age standardized incidence rates/100,000 is 0.5, 0.8, 0.8, 1.0 and 1.1/100,000 respectively.[6]

Malignant melanoma is the most aggressive skin cancer.[7] This aggressive behaviour accounts for 60% of all skin cancer related deaths. The estimated lifetime risk is 1 in 75 on the average in the U.S.A.[8] In 2008, more than 60,000 cases of melanoma and more than 8,000 associated deaths were expected in the United States.[9] The mortality rate of malignant melanoma is maintained at a high rate despite increased public awareness that has been put in place to promote early detection.[10, 11] The age adjusted

mortality rates/100,000 for males and females in WHO South East Asia Region (SEARO), sub - Sahara Africa, WHO Americas region (PAHO), WHO Europe region (Europe) , the World is 0.7, 1.7, 1.9, 0.9 and 0.1, 0.8, 0.9, 1.2, 0.6 respectively.[6]

MM accounts for 4.6 to 39% of malignant skin tumours in Nigeria.[12-22] Of these, Samaila and Ranfindadi,[20] Mandong et. al,[17] Ochicha et. al[22] and Mohammed et. al[18] from the northern part of Nigeria reported that MM accounted for 17.4, 24.2, 34.4 and 37.4 percent of all malignant skin tumours respectively, while Asuquo and Ebughe,[13] Adeyi and Banjo,[12] Gana and Ademola,[16] Olu-Eddo and Forae,[19] and Datunbo-Brown[14] from the southern part of the country reported that MM accounted for 13.4, 17.5, 25.1, 32 and 39 percent of all malignant skin tumours respectively. Thus there is no significant variation in findings from the northern and southern part of the country. Reports from Ghana,[23] Togo,[24] Tunisia,[25] and Tanzania[26] indicate that MM accounts for 42%, 12.3%, 4.7% and 67% of all malignant skin tumours respectively.

Several studies have shown that it is more common in males.[17, 18, 22, 27, 28] The World Health Organization (WHO) had documented that MM affects predominantly adults and elderly patients with a peak of incidence around the sixth decade of life in white populations of Northern America, Australia, New Zealand and Europe.[29] Previous studies[18-20] done in Nigeria have shown the age range to be 22 to 85years (Jos [22-85 years],[18] Benin city [25-79 years][19] and Port Harcourt [39-76 years][30]), while the peak age is from the 5th to 8th decade as reported from several studies[17-19, 22, 28, 30] that were carried out in Jos (5th and 6th decade), Kano (6th decade), Zaria (6th decade), Benin City (5th decade) and Port-Harcourt (6th to 8th).

The risk factors for the development of malignant melanoma include intermittent intense sun-exposure in individuals who tan poorly, increase sun sensitivity associated with people with pale skin, blond or red hair, presence of numerous freckles and a tendency to burn or tan poorly, two or more episodes of a history of blistering or painful sunburns before the age of 20 years, presence of precursor lesions (large congenital nevi and dysplastic or atypical nevi),[31] depletion of the ozone layer, which protects the earth's surface against UVR by filtering out a large part of the UVR from the sunlight before it reaches the earth's surface,[29] disease conditions such as xeroderma pigmentosum, retinoblastoma, systemic mastocytosis, Cowden's disease, neurofibromatosis, the cancer family of Lynch, infection with human immunodeficiency virus[31] and high social economic class a higher socio-economic status, probably due to a higher excessive intermittent exposure to UVR such as sunbathing and getting a tan in this group.[29] Less important risk factors include Marjolin's ulcer, burns scar, ingestion of arsenic-polluted water exposure to polyvinyl chloride and solvents, and frequent use of tanning solvents. There is a genetic predisposition to the development of malignant melanoma which occur in a familial setting in 8 - 10 % of cases.[31] Several families with melanoma often have deletion of specific region on chromosome 9p21.[31] Inherited mutations of tumour-suppressor genes (eg CDKN2A) are strongly associated with familial melanoma but probably underlie less than 1% of all cutaneous melanoma.[32] Key to the development of melanoma is intermittent high-dose UV radiation which is the major environmental risk factor, often in combination with endogenous factors, including genetic susceptibility, immune deficient status and skin types I and II, number of naevi, clinical atypical naevi and a family history of skin cancers.[29]

Clinically most melanoma arise de novo i.e. in the absence of a background congenital nevi.[29, 31] They present as asymmetrical, irregularly pigmented lesions with ill-defined borders measuring greater than 4 mm in diameter. Clinically melanomas are divided into four major types.[29] They are: Lentigo maligna melanoma occurring on sun-damaged skin of the face and presenting as large, irregularly pigmented patches;[33] Acral lentiginous melanoma occurring on palmar, plantar and subungual skin and clinically present as pigmented plaques or nodules which are often ulcerated;[31] Superficial spreading melanoma has a variegated colour with an irregular expanding margin that can simulate a patch of vitiligo clinically;[31] Nodular melanoma often presents as a fast growing pigmented nodule which bleeds or ulcerates. It is the most aggressive type of melanoma and most times than not is seen on body sites that are intermittently exposed to sunlight.[29] Melanomas can arise in association with nevi. This include congenital nevi and dysplastic nevi.[29, 31]

The health burden vis a vis the morbidity and mortality associated with Melanoma's has placed it in the fore. Thus continuous gathering and analysis of data from this tumour has become imperative to allow for planning, allocating of human and capital resources and also in the appraising of the trend of the lesion against previous documented data in our environment. The aim of this study is therefore to elucidate the frequency, age and sex distribution of Malignant Melanoma in the University of Benin Teaching Hospital, Benin City, Edo State, Nigeria with the hope of providing information that is invaluable in answering the aforementioned concerns.

II. METHODOLOGY

This was a descriptive cross-sectional study that spanned a 10 year period. It covers the period from 1st of January 2004 to 31st of December 2013. It was carried out in the Department of Morbid Anatomy, University of Benin Teaching Hospital. The surgical pathology register, histology request form and duplicate copies of the histology report were useful in providing information on the age, sex, nature of specimen, hospital number, histology laboratory

number, clinical presentation and clinical diagnosis of each patient/case. Histology slides were retrieved, reviewed under the light microscope and the diagnosis recorded against the corresponding patient's name on a data spread sheet. The data obtained from this study was analysed using the SPSS statistical package (V.16.0). Ethical clearance was sought and obtained from the University of Benin Teaching Hospital Ethical Review Committee.

III. RESULTS

One hundred eighty seven (187) malignant skin tumours had confirmed histological diagnosis during the period of this study. Fifty one percent were females while 49% were males. Their ages ranged from the 1st to 12th decade. Their median and modal ages were 40 and 27 years respectively, (Table 1).

The prevalence of malignant melanoma was 14.4% (27 cases) Table, 2. It was the 3rd most common primary malignant skin tumour after squamous cell carcinoma (30.5%) and Kaposi's sarcoma (40.6%) that were the second most common and the most common primary malignant skin tumours respectively.

Of these 27 cases of MM, 12 cases occurred in the males while 15 cases occurred in females giving a male to female ratio of 1:1.3. The mean age for MM was 52.96 years (SD = 22.04) with an age range of 3 – 111 years and a peak in the 7th decade, Table 3 and 4. The mean ages for MM in males and females were 58.83 years (SD=22.94) and 48.27 years (SD=20.87) respectively, Table 3.

In males there was a bimodal peak in the 7th and 8th decades, Table 4. In females the peak incidence of MM was observed in the 4th decade, Table 4. The lower limb was the most common site for MM. Distribution of MM in other sites is shown in Table 5.

Table 6 shows the Clark's level of melanoma in which Clark's level 4 was the most frequent accounting for 20 cases (74%).

See figure 1a-b showing atypical cells (spindle and polygonal) with prominent nucleoli.

Table 1 Frequency, median and modal ages, age range and percentage sex distribution of malignant skin tumours

					Percentage %	
Skin tumours	No of cases	Median (Age in years)	Modal	Age Range (years)	M	F
Malignant	187	40	27	3-111	49	51

Table 2 showing prevalence of melanoma during the study period

Malignant skin tumours	Percentage (%)
Kaposi's sarcoma	41.0
Squamous cell Carcinoma	31.0
Malignant melanoma	14.0
Others	14.0
Total	100.0

Table 3 showing the frequency, mean age and age range of cases with malignant melanoma

				Mean age(Years)	
Tumour	No of Cases	Mean age(Years)	Range (Years)	Male	Female
Melanoma	27	52.96	3-111	58.83	48.27

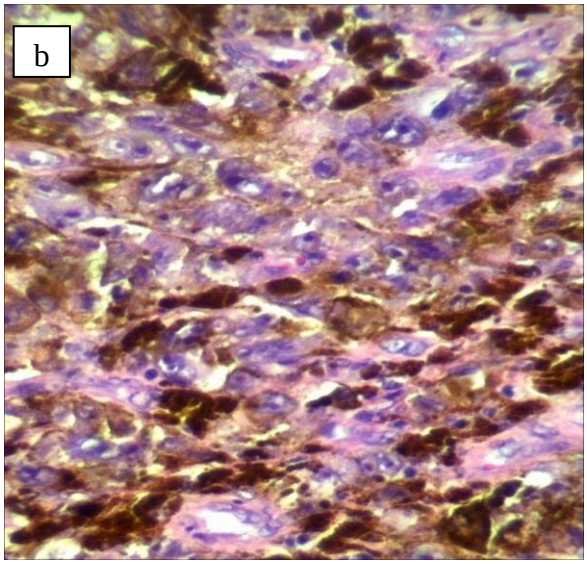

Fig. 1a-b. (a) Malignant melanoma, showing fusiform and epithelial cells with melanin incontinence within the reticular dermis. (b) Higher magnification of (a) showing nuclear pleomorphism, prominent nucleoli and melanin. H and E (a) x40 magnification and (b) x 400 magnification.

Table 4 Age group and sex distribution of malignant melanoma

	Malignant melanoma		
Age	Male	Female	Total
0-9	-	1	1
10-19	1	-	1
20-29	-	1	1
30-29	1	4	5
40-49	2	1	3
50-59	1	3	4
60-69	3	3	6
70-79	3	1	4
80-89	-	1	1
90-99	-	-	0
100-109	-	-	0
110-119	1	-	1
Total	12	15	27

Table 5. Site distribution of malignant melanoma

Anatomic site	Frequency
Head and Neck	3
Trunk	2
Lower limb	13
Upper limb	2
Anogenital	0
Total	20

Table 6. Clark's level

Clark's level	Frequency/percentage (%)
1	-
2	2(7)
3	-
4	20(74)
5	5(19)
Total	27(100)

IV. DISCUSSION

Malignant melanoma (MM) accounted for 14.4 % of malignant skin tumours in this study. This was comparatively similar to reports from studies done in Calabar[13] (13.4%), Lagos[12] (17.5%) and Zaria[20] (17.4%) and contrary to a much higher figure (32 %) from previous studies done in Benin city[19] and other parts of Southern and Northern Nigeria.[14, 16-18, 22] This study observed 27 (14.4%) cases of malignant melanoma over a shorter duration (10 years) when compared to a previous study in Benin City[19] that reported 61 (32%) cases of malignant melanoma over a 25 year period. This may have been partially responsible for the disparity in the frequency of malignant melanoma in these studies. While MM was the most common malignant skin tumour in the previous study from this centre,[15] it dropped down 2 spots to become the third most common malignant tumour. The disparity in the duration of both studies

as alluded to earlier may be partly responsible. The scourge of HIV infection with an associated increase in the incidence and prevalence of AIDs associated Kaposi's sarcoma (KS) as observed by Barro Traore et al,[34] Onunu et al[35] and Asuquo et al[36] in their respective study may also played a pivotal role in making KS the most common malignant tumour at the expense of MM and other malignant tumours. A much higher frequency was noted in Ghana[23] (42%) and Tanzania[26] (67%), while in Togo[24] a relatively similar frequency of 12.3% was noted. These figures were far higher than that observed in Tunisia[25] (4.7%). The peak incidence of MM in this study was in the 7th decade which falls within the range of peak ages (5th to 8th decades) observed in previous studies done in Nigeria.[17-19, 22, 28, 30] This study noted a peak incidence of malignant melanoma (7th decade) that is higher than a previous study in this environment that was done by Olu-Eddo and Forae[19] who noted a peak in the 5th decade. The reason for this disparity in peak ages from these two studies in this environment might be related to the number of cases seen and the duration of study. This study noted a unimodal peak in the 7th decade unlike Mohammed et al[18] in Jos and Datubo-Brown[14] in Port Harcourt who noted from their studies a bimodal (5th and 6th decade) and trimodal (6th to 8th) peak incidence respectively. A comparative peak incidence of 6th decade has been documented for MM occurring in Caucasians.[29] This study noted a slight female preponderance with a male to female ratio of 1:1.3. This is slightly different from a male to female ratio of 1:1 that was previously observed by Olu-Eddo and Forae[19] in this environment. It also contrasts reports from previous studies that noted a male predilection in Caucasians (Townsville, Australia)[27] and in Nigerians [Mandong et al[17] (Jos), Ochicha et al[22] (Kano) and Samaila and Adewuyi[28] (Zaira)]. The lower limb was the most common site of MM in this study, which is similar to the reports of studies done in Nigeria.[14, 15, 17-20] The vast majority of MM were in advanced stages of Clark's level 4 and 5 (93%). It is in keeping with a previous study in from this centre by Olu-Eddo and Forae that reported that malignant melanoma in advanced stages 4 and 5 was the most common constituting 81%.[19]

V. CONCLUSION

The tale of malignant melanoma is such that it has dropped 2 positions from being the most common malignant skin tumour to being the 3rd most common malignant skin tumour in our environment. In line with this tale, the peak incidence was noted in the 7th decade (i.e. 2 decades more than that previously documented), a bimodal peak was observed in males and the lower limb was the most common site. The majority of cases present in the advanced stages. The data generated from this study gives the most recent reflection of the position of MM in our environment. Thus invaluable for; planning; allocating of health resources (human and capital); and bringing to fore significance of the periodic collection and analysis of data of lesions in a particular environment.

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