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Non-Melanoma Skin Cancers: A Teaching Hospital-Based Study

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Abstract

Context: The mortality rate of non-melanoma skin cancers (Basal cell carcinoma [BCC] and squamous cell carcinoma [SCC]) is low. This implies a high morbidity state. The cost implication to the health sector may be huge depending on its magnitude. The data generated from this study will give an insight of the burden of non-melanoma skin cancers (NMSC) on our health facility as well as being utilized for the purpose of records and ultimately for planning locally and nationally.
Aims and objectives: To determine the frequency, age and sex distribution of NMSC.
Materials and Methods: A descriptive cross-sectional retrospective study. All cases of NMSC (BCC and SCC) diagnosed histologically between January 2004 and December 2013 in the Department of Morbid Anatomy, University of Benin Teaching Hospital were analysed.
Results: The NMSC accounted for 36.90% of malignant skin lesions. Their age spanned from the 2nd to the 9th decade with a mean age in the 5th decade (47.49 years). There was no significant sexual predilection (male:female = 1.03:1). SCC and BCC accounted for 82.61% and 17.39% respectively of NMSC. The head and neck region was the most common site of presentation of these tumours.
Conclusion: The NMSC comprises a notable portion (36.9%) of malignant skin tumours. The frequency of SCC was by far higher than that of BCC. The mean age of NMSC, SCC and BCC was in the 5th decade (40-49years). No significant sexual predilection was noted in this study. The head and neck region was the most common site for NMSC.

Keywords: Non-melanoma skin cancers, basal cell carcinoma, squamous cell carcinoma

Introduction

Skin tumours consist of a wide array of malignant and benign pathologic entities,[1,2] however a continuous increase in the incidence of skin malignancies has been noted globally.[3-5] Common primary malignant skin tumours are basal cell carcinoma (BCC), squamous cell carcinoma (SCC) and malignant melanoma.[6,7]
The BCC and SCC (collectively called non melanoma skin cancers) occur at a frequency much higher than other skin cancers.[8] The age standardized incidence rate of non-melanoma skin cancer (i.e. basal cell carcinoma and squamous cell carcinoma) in Nigeria was reported as 1.7/100,000.[9] The highest age standardized incidence rate in Central and South America was reported in Brazil as 137/100,000 population. The age standardized incidence rate/100,000 population in Costa Rica, Ecuador, Peru, Chile and Argentina were 28.5/29.6, 22.7/23.4, 13.5/13.9, 11.7/0.8, 9.5/12.9 respectively. The lowest rate of 0/100,000 was found in Columbia.[5] The highest age standardized incidence rate in Asia was found in Turkey and it accounted for 13.7/11.9/100,000.[5] The age standardized incidence rate/100,000 population in Thailand, Philippines, Japan, Kuwait and China is 2/2, 1.6/1.5, 1.0/0.9, 0.8/0.8 and 0.7/0.8

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respectively.[5] The lowest incidence rate was reported in India as 0.2/0.3/100,000 population.[5]

Basal cell carcinoma is a group of malignant cutaneous tumours characterized by the presence of lobules, columns, bands or cords of basaloid cells.[10] The highest age standardized incidence rate of basal cell carcinoma in the world was found in Australia. It was documented as 1626.3/100,000 (i.e. 2058.3/100,000 and 1194.5/100,000 for males and females respectively).[11] In Europe, the highest age standardized incidence rate was found in the United kingdom.[12] It was reported as 115.6/100,000 population. The age standardized incidence rate/100,000 population for Denmark, Italy, Switzerland, Slovakia and Croatia were 93.9, 70, 70, 38 and 29.05 respectively.[12,13] The highest age standardized incidence rate in Africa was found in Tunisia. It was reported as 9.05/100,000. In Algeria, Egypt, Uganda and Zimbabwe (non-white), the age standardized incidence rate/ 100,000 population were reported as 4.4/2.6, 3.5/0.0, 0.8/0.0, 0.4/1.1 respectively.[5]

Squamous cell carcinoma is a malignant neoplasm of epidermal keratinocytes in which the component cells show variable squamous differentation.[14,15] The highest age standardized incidence rate of squamous cell carcinoma in the world was found in Australia. It was reported as 1043.55/100,000 (i.e. 1332.3/100,000 and 754.8/100,000 for males and females respectively).[11] In Europe, the age standardized incidence rate/100,000 in Switzerland, Sweden and Croatia in decreasing frequency were 28.9, 24.9 and 8.9 respectively.[12] Age standardized incidence per 100,000 in Alberta, Canada and Arizona, USA were 60.2 and 290 respectively.[12] The highest age standardized incidence rate in Central and South America was found in Brazil.[5] It was reported as 41.75/100,000 population.[5] The age standardized incidence rate/100,000 in Costa Rica, Peru, Ecuador and Chile in order of decreasing rate were 8.5, 5.9, 4.7 and 3.45 respectively. The lowest rate of 2.25/100,000 was found in Argentina.[5] The highest age standardized incidence rate in Asia was found in Turkey.[5] It was reported as 4.35/100,000.[5] The age standardized incidence rate/100,000 in Thailand, Japan, Philippines, India and Kuwait in order of decreasing rate were 1.95, 1.75, 1.25, 0.35 and 0.25 respectively.[5] The lowest incidence rate was reported in China as 0.1/100,000.[5]

The mortality rates of NMSC are low[15,16] and average approximately 0.1% of their incidence rates.[15] The NMSC (BCC and SCC) therefore has a high morbidity with resultant huge cost to the health sector.[15] It is expected that data from this study will be relevant for the purpose of research, records and ultimately for planning locally and nationally. The aim of this study is to determine the frequency, age and sex distribution of NMSC at the Morbid Anatomy Department of the University of Benin Teaching Hospital, Benin City.

Materials and Method

This was a descriptive cross-sectional retrospective study. The targets of this study were all cases of NMSC (BCC and SCC) diagnosed histologically between January 2004 and December 2013 in the Department of Morbid Anatomy, University of Benin Teaching Hospital. The Department of Morbid Anatomy receives skin biopsies from Dermatology and General Surgery Departments in University of Benin Teaching Hospital, Secondary and Primary Health Care Centres within the Benin City metropolis, neighbouring towns and villages in Edo State, as well as neighbouring states. Information for this study were obtained from the surgical pathology registers, histology request cards, patients' case notes, duplicate copies of histology reports, haematoxylin and eosin stained slides and stored paraffin embedded tissue blocks stored in the departmental archives. The surgical pathology register, histology request form and duplicate copies of the histology report and patient case notes 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. Newly prepared sections were made from the paraffin-embedded tissue blocks that were retrieved from the archives of the Department of Morbid Anatomy, University of Benin Teaching Hospital and stained with haematoxylin and eosin in cases where slides were missing or the quality of the slide had greatly diminished. The data obtained from this study was analysed using the Statistical Package for Social Sciences, version 16 (SPSS 16, SPSS Inc.

Chicago, Illinois, United States of America), for categorical variables, (sex and histologic diagnosis of BCC and SCC) the frequency and corresponding rates in percentages were analysed while for continuous variable (age) the age range, mean age, standard deviation and peak ages were analysed. The exclusion criteria were all cases of incomplete demographic data, missing slides and corresponding blocks from the departmental archives.

Table 1 Age range, mean age, peak age and sex distribution of the study population

	No. (%)	Age range (years)	Mean age (years)	Standard deviation	Peak age (years)
Female	34 (49.30)	19 – 80	46.47	17.80	40 – 49
Male	35 (50.70)	19 – 88	48.49	17.67	30 – 39
Study population	69 (100.00)	19 – 88	47.49	17.62	40 – 49

Table 2 Age group and sex distribution of the study population

Age group	Male	Female	Total
10-19	1	2	3
20-29	4	5	9
30-39	7	7	14
40-49	9	6	15
50-59	4	5	9
60-69	5	5	10
70-79	2	2	4
80-89	3	2	5
Total	35	34	69

Table 3Age group and sex distribution of the squamous cell carcinoma and basal cell carcinoma patients

	SCC		BCC		
AGE	M	F	M	F	TOTAL
10 – 19	1	2	-	-	3
20 – 29	3	4	1	1	9
30 – 39	6	6	1	1	14
40 – 49	6	5	3	1	15
50 – 59	4	4	-	1	9
60 – 69	4	4	1	1	10
70 – 79	2	1	-	1	4
80 – 89	3	2	-	-	5
TOTAL	29	28	6	6	69

Table 4; Frequency, mean age and age range of the patients with squamous cell carcinoma and basal cell carcinoma

Skin tumours	No. of cases	Mean age ± SD (years)	Age range (years)	Mean age± SD (years)	
				Male	Female
SCC	57	47.75±18.16	19-88	49.48±18.58	45.96±17.89
BCC	12	47.17±13.94	29-70	43.67±12.48	50.67±15.56

Table 5 Site distribution of NMSC

NMSC	Head/Neck	Anogenital	Trunk	Lower limb	Upper limb	No of cases with specified site
SCC	19	3	2	10	2	36
BCC	3	0	0	1	0	4
TOTAL	22	3	2	11	2	40

Key: SCC= Squamous cell carcinoma, BCC = Basal Cell Carcinoma NMSC = Non melanoma skin cancer

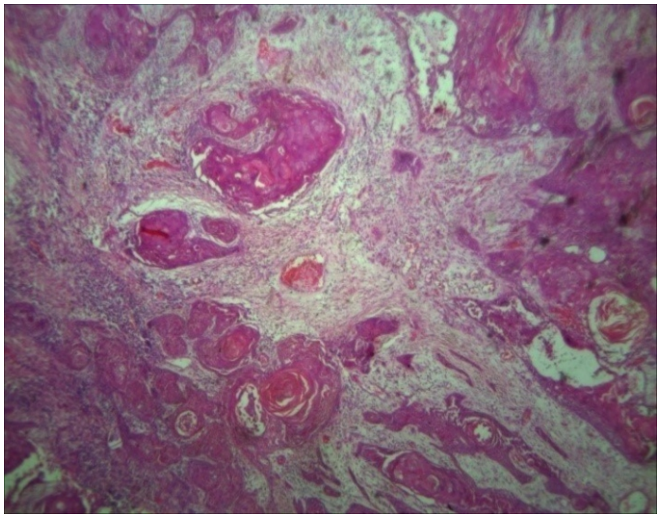

Figure 1: Squamous cell carcinoma, showing clusters of atypical epithelial cells forming keratin pearls. H and E stain. X40 magnification.

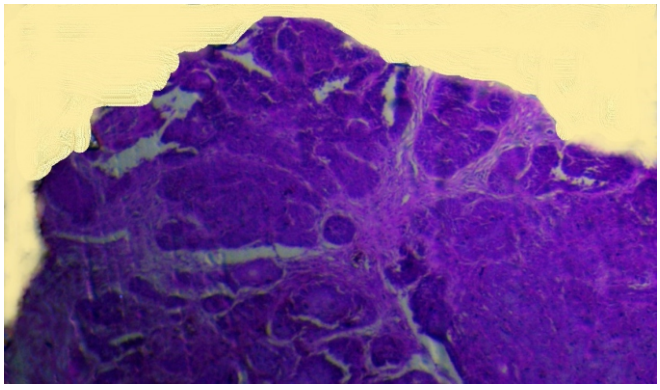

Figure 2: Basal cell carcinoma, showing nest of malignant basaloid epithelial cells with peripheral palisading and retraction artefacts. H and E stain. X 40 magnification.

Results

There were 187 malignant skin lesions seen during the period of the study under review. Of these, 36.90% (69) of the cases were NMSC. They had an age range of 19 to 88years, a mean age of 47.49 years (SD = 17.62), the median and modal ages were 45 years and 40 years respectively as shown in Table 1. There were 35 males and 34 females giving a male to female ratio of 1.03:1. The mean, median and modal ages in males and females of the study population is as shown in table 1. The peak age of the study population was in the 5th decade. The peak ages in males and females of the study population is as shown in tables 1 and 2.

In this study, SCC's were 57 cases and this represented 30.48% and 82.61% of malignant skin tumours and NMSC respectively. Of these 57 cases, 29 cases occurred in males while 28 cases occurred in females as shown in table 3. This gave a male to female ratio of 1.04:1. The mean age for SCC was 47.75 years (SD = 18.16) with an age range of 19 – 88 years and a peak in the 4th decade. The mean ages for SCC in males and females were 49.48 years (SD=18.58) and 45.96 years (SD=17.89) respectively as shown in table 4. A bimodal peak in the 4th and 5th decades was observed in males as shown in table 3. The peak incidence of SCC in females was observed in the 4th decade as shown in table 3. The head and neck was the most common site for SCC. Distributions of SCC in other sites are shown in table 5. The photomicrograph of squamous cell carcinoma is as shown in figure 1.

Basal cell carcinoma (BCC) accounted for 12 cases of NMSC and therefore represented 6.41 % and 17.39 % of malignant skin tumours and non-melanoma skin cancers (NMSC) respectively. Of these 12 cases, 6 cases occurred in males while the

remaining 6 cases occurred in females as shown in table 3. This gave a male to female ratio of 1:1. The mean age for BCC was 47.17 years (SD = 13.94) with an age range of 28 – 70 years and a peak in the 5th decade. The mean ages for BCC in males and females were 43.67 years (SD=12.48) and 50.67 years (SD=15.56) respectively as shown in table 4. The peak incidence of BCC in males was in the 5th decade as shown in table 3. The head and neck was the most common site for BCC. Distributions of BCC in other sites are shown in table 5. The photomicrograph of basal cell carcinoma is as shown in figure 2.

Discussion

The NMSC (SCC and BCC) in this study accounted for approximately 2/5th (36.90%) of malignant skin tumours. In the same vein, squamous cell carcinoma (SCC) accounted for 30.48% of malignant skin tumours. This is comparatively similar to the reports of the studies done in Benin City (24% and 24.1%) and Lagos (28.3%).[17-19] It however contrasts the 13.6, 40.5 and 51.3 percent reported from previous studies done in Benin City (Ukonu and Eze), Ibadan (Gana and Ademola) and Enugu (Nnabuko et al) respectively.[20-22] These disparities between the findings of this study and those aforementioned studies by Ukonu and Eze, Gana and Ademola and Nnabuko et al may be related to the duration of the respective studies and the sample sizes. The previous study from Benin City (Ukonu and Eze) was carried out over a year with 7 cutaneous malignant skin tumours analysed, while the Ibadan (Gana and Ademola) study was over 20 years duration with 494 malignant skin samples analysed and the Enugu (Nnabuko et al) study analysed 80 malignant skin samples over ten years. The frequency of occurrence of SCC seem relatively higher in the Northern part of Nigeria and in Ghana where previous studies have shown that it represented 40-62 percent of malignant skin tumours.[23-26] This study noted a slight male preponderance in agreement with reports of previous studies in Caucasians and Nigerians.[11,17,18,27,28] This study noted a peak incidence of SCC in the 4th decade which is in agreement with previous studies done in Nigeria where it was shown that SCC was most common in the 4th-6th decades.[17,18,24-26] These findings are in contrast to what obtains in Caucasians where it has been documented that SCC is most common from the 7th decade.[15,29]

This study also noted that SCC which hitherto was the 3rd most common primary malignant skin tumour in Benin City[18] is presently the 2nd most common malignant skin tumour after Kaposi's sarcoma. The surge in HIV infection, the shorter duration of this study (10 years) compared to the longer duration (25 years) of the study done by Forae and Olu-Eddo may be responsible for the changing trend with associated increase in the frequency of KS and the reduction in the frequency of malignant melanoma.[18,19,30,31]

The head and neck region was the most common site of SCC in this study which is similar to the reports of studies done in Nigeria, Tanzania and India.[18,19,32,33] This is contrary to other reports from studies done in Nigeria.[24,33]

In this study, basal cell carcinoma (BCC) accounted for 6.42% of malignant skin tumours. This is consistent with the tumour being more common in the Southern part of Nigeria and comparatively similar to the findings of studies done in Ibadan (6.7%), Benin City (9.1%, 9.6% and 10%) and Lagos (10 %).[17-20,22] It however contrast the 22% reported by Datubo-Brown in Port Harcourt.[27] This may be attributed to the smaller sample size (18 malignant skin biopsies) analysed by Datubo-Brown over a much relatively shorter study duration of 3 years when compared to a larger sample size over a relatively longer duration in this study (187 malignant skin biopsies over a 10 year period) and also in studies with comparative values.[17-20,22] In contrast to the findings of this study, previous reports from studies done in Northern Nigeria had documented a lower frequency (2-4%) of BCC.[22,24,25]

Australia has been reported to have the highest incidence of BCC worldwide with age standardized incidence rate of 1623.3/100,000.[11] The reason for this disparity is the risk associated with the development of the tumour in Caucasians with outdoor occupation that exposes their skin to UV radiation from the sun is higher than that in Blacks.[11,34] The skin of Blacks is protected from UV radiation by the presence of melanin pigments in the epidermal layer of the skin. A multicentre population based study in future will be useful in determining age standardized incidence rates of

BCC in Nigeria.

There was no sex predilection in this study contrary to previous studies in the Saudis, Indians, Caucasians, and Nigerians which showed a male predilection.[6,11,19,28,32] This study noted a peak in the incidence of BCC in the 5th decade which is in agreement with previous studies done in Jos (5th decade) and Zaria (5th decade), and comparatively similar to that done in Benin City (4th decade) and Zaria (4th decade).[18,19,24,26]

The head and neck region was the most common site of BCC in this study, which is similar to the reports of previous studies done in Nigeria, Tanzania, India and Croatia.[13,18,19,24,32,33] This consistently observed prevalence of BCC in the head and neck region may be attributed to the fact that the head and neck region is persistently exposed to ultraviolent light in contrast to most other parts of the body that are usually covered and protected by clothes or shoes.

Conclusion

From the foregoing, the NMSC constitute a noteworthy portion (36.90%) of malignant skin cancers in our own environment. The magnitude of SCC (82.61%) was by far higher than that of BCC (17.39%). These tumours collectively had a wide age range (19 – 88 years) and a mean age in the 5th decade (40-49 years). There was no significant sexual predilection in the study population on the one hand and also in the individual tumours (SCC and BCC) on the other hand. The head and neck region was the most common site for this lesion in both SCC and BCC.

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