ORIGINAL RESEARCH

Clinico-epidemiological profile of skin cancer in South Western Nigeria

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Abstract

Background

Skin cancer is one of the most common forms of cancer. The incidence of skin cancer is on the increase among Caucasians and Africans, though there are significant differences in the pattern of presentation. This study sought to evaluate the pattern of skin cancer presentation in Ibadan, south-west Nigeria. The objective of the study was to determine the risk factors and pattern of presentation.

Methods

Data extraction forms were used to obtain information from the hospital records of patients with histological diagnoses of skin cancer between January 2001 and December 2010. The study took place at the Radiation Oncology Department, University College Hospital, Ibadan, Nigeria.

Results

A total of 126 cases were identified. The age range of patients was from 7 to 98 years, with a mean age of 46.6 years. The male-to-female ratio was 1.5:1. The peak age of incidence was between 40 and 49 years old. Of the risk factors, trauma (18.3%) and albinism (15.9%) were the most common. Squamous cell carcinoma (63%) was the most common histological sub-type recorded. The majority of the respondents presented with locally advanced (43.7%) and metastatic (22.2%) stages. The lower limb (59.9%) and head and neck region (22.0%) were the most commonly affected sites. The lungs (46.4%) were the most common site of distant metastases, followed by the liver (21.4%), and the brain (7.1%) was the least common site of metastasis.

Conclusion

The finding that majority of the respondents in this study presented with locally advanced and metastatic disease buttresses the need for public awareness programs to ensure uptake of preventive measures by the populace and emphasizes the need for early presentation.

Keywords: Skin cancer, Nigeria, Incidence

Introduction

Skin cancer is characterized by the growth of abnormal cells capable of invading and destroying other associated skin cells. Although each cell type in the skin is liable to give rise to a different type of neoplastic tumor, skin cancer is conveniently classified into melanoma and non-melanoma skin cancers (NMSC)[1]. Melanoma is the most severe form of skin cancer. It is an aggressive and often fatal type of cancer that arises from transformed melanocytes (melanin-producing cells)[2]. The non-melanoma group encompasses all other skin cancers and has a clinical course ranging from indolent to very aggressive depending on the histological type[3]. Worldwide the incidence for NMSC varies widely with the highest rates in Australia [>1000/100, 000 person-years for basal cell carcinoma (BCC)] and the lowest rates in parts of Africa (< 1/100, 000 person-years for BCC)[4].

The two common forms of non-melanoma skin cancer are squamous cell carcinoma and basal cell carcinoma. The pattern of dermatological malignancies in Nigeria showed that squamous cell carcinoma is the most common histology type[5]. This is in contrast with what is seen in caucasian population in which 80% of the lesions are basal cell carcinoma (BCC) and 20% are squamous cell carcinoma (SCC)[6]. BCC and SCC make up 99% of all NMSC, with BCC occurring 3 to 5 times more common than SCC in the USA[7,8]. BCC is also the most common skin cancer in people with outdoor occupations[9], such as farmers, fishermen, and construction workers. In an analysis of published literature on skin cancer in Nigeria, it was noted that the relative frequency of skin cancer is much lower than in White populations even though the incidence of skin cancer has continued to increase over the past decades[10]. Nigeria has an estimate of 65,258 new cases of skin cancer annually, giving a projected annual incidence of 52 in 100,000 with skin cancer ranked sixth in the top ten malignancies in Nigeria[11]. Skin Melanoma comprises only 3-5% of all skin cancers but accounts for about 75% of skin cancer mortality[12]. Skin cancers occur more commonly in men than in women[13].

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Table 1: Socio-demographic data of skin cancer patients

Gender	Frequency	Percentage (%)
Male	77	61.1
Female	49	38.9
Occupation		
Civil servant	27	21.4
Student	3	2.4
Private worker	12	9.5
Unemployed	24	19
Farming	57	45.2
Trader	3	2.4
Education		
Primary education	30	23.8
Secondary education	54	42.9
Tertiary education	39	31
No formal education	3	2.4

Table 2- Risk factors for skin cancer identified among patients in Ibadan Nigeria

Pre-disposing factors	Frequency	Percentages (%)
Trauma	23	18.3
Cigarette smoking	12	9.5
Alcohol	14	11.1
Albinism	20	15.9
Chemical exposures	19	15
Ionizing Radiation	6	4.8
Prolonged Sun exposure	9	7.1
Family history	6	4.8
Immunosuppression	4	3.2
Melanocytic naevi	3	2.4
Unspecified	10	7.9

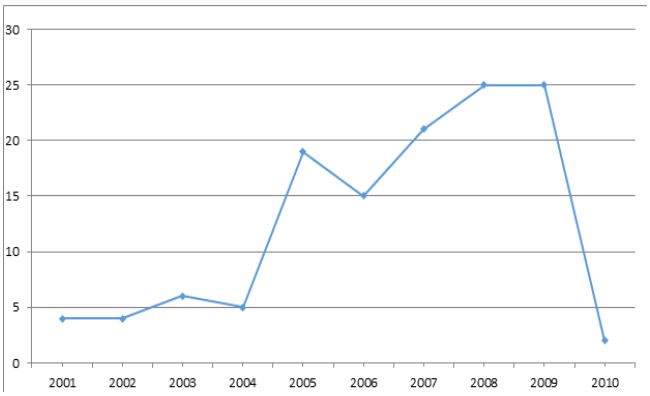

Figure 1: Annual frequency of skin cancer in Ibadan, Nigeria

Non melanoma skin cancer is commoner in middle aged and elderly though it may present earlier in albinos[14]. More than one third of all cases of malignant melanoma occur in people under 55 years of age[15].

The causes of skin cancer are multifactorial, including both environmental and host factors. The known environmental risk factors include sun exposure (ultraviolet (UV) light) and chemical exposure.

Table 3: Clinical characteristics of patients with skin cancer

	Frequency	Percentage (%)
Histology		
Basal cell carcinoma	21	16.7
Squamous cell carcinoma	63	50
Melanoma	30	23.8
Kaposi sarcoma	6	4.8
Adnexal tumour	3	2.4
Dermatofibrosarcoma	3	2.4
Total	126	100.0
Symptoms distribution		
Pain	24	19
Painful Swelling	27	21.4
Numbness	3	2.4
Ulceration	12	9.5
Skin discolouration	9	7.1
Painless swelling	51	40.5
Total	126	100.0
Stage at presentation		
Stage1	18	14.3
Stage 2	25	19.8
Stage 3	55	43.7
Stage 4	28	22.2
Total	126	100.0
Site of distant metastasis of skin cancer (stage IV) at presentation		
Lungs	13	46.4
Bone	4	14.3
Liver	6	21.4
Brain	2	7.1
Lymph node	3	10.7

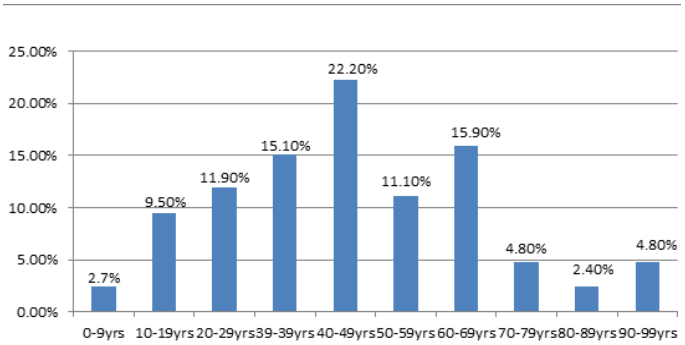

Figure 2- Age distribution of patients with skin cancer in Ibadan Nigeria

Carcinogenesis results from ultraviolet solar radiation-induced DNA mutations in the p53 tumor suppressor gene and the induction of immunologic changes that inhibit the immune response against the tumor[16].

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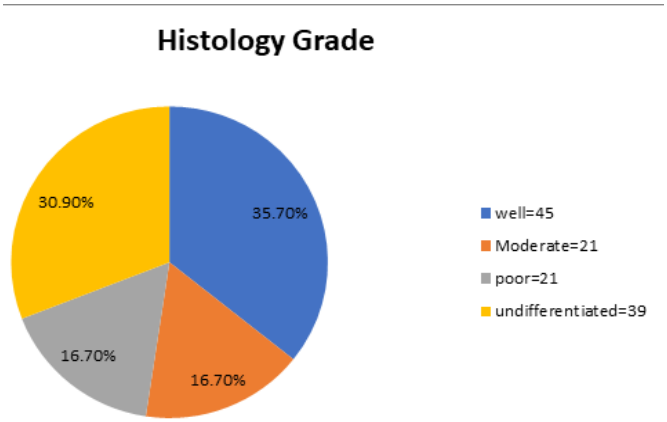

Figure 3- Histological grades of skin cancers among patients in Ibadan, Nigeria

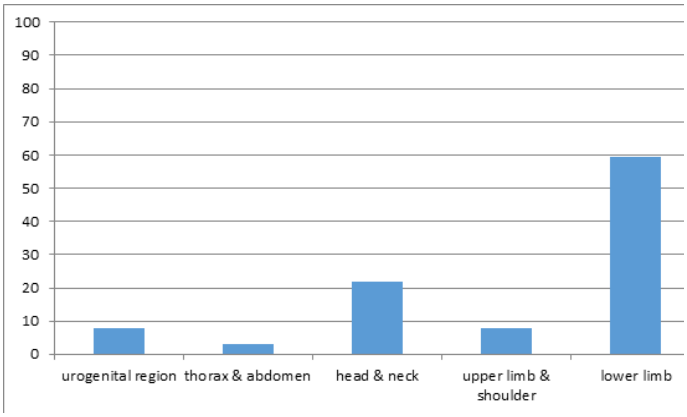

Figure 4: Anatomical sites affected by skin cancer among patients in Ibadan Nigeria

Chemical exposures have also been implicated in the aetiology of skin cancer. Such chemicals include polycyclic aromatic hydrocarbons and croton oil[17]. Host risk factors include human papilloma virus infection, genetic susceptibilities, skin tone and immunosuppression[18]. Kaposi sarcoma incidence has increased in Nigeria with the prevalence of human immunodeficiency virus (HIV)[19]. Most melanomas are believed to arise de novo, they also may develop from pre-existing benign nevi, especially those subject to repeated trauma and irritation[20]. Skin cancers are a major risk associated with albinism and are thought to be a major cause of death in African albinos[14]. The prospects of skin cancer depends on Breslow's tumour thickness, Clark's level of invasion (melanoma), histological type, degree of histological differentiation of the tumour cells, clinical staging, primary site of tumour, age of patient, sex, co-morbid conditions and neuro-vascular invasion[20].

Mortality and morbidity from skin cancer are increasing in Nigeria despite the fact that most skin cancers are preventable. Reports on clinical aspects of skin cancer in Nigeria are scarce. The aim of this study was to describe the clinical, epidemiological, and socio-demographic aspects of skin cancer in a Nigerian institution.

Materials and Methods

This was a retrospective descriptive study carried out on patients with skin cancer seen at the Radiation Oncology Department of the University College Hospital Ibadan, Nigeria, between January 2001 and December 2010. Ethical clearance to conduct the study was obtained from the Joint Ethical Review Committee of the University of Ibadan/ University College Hospital, Ibadan. Only cases with histological confirmation of skin cancer were included in the study.

Data collection

All available radiotherapy treatment records and case files of skin cancer cases attended between January 2001 and December 2010 were retrieved for data collection. Data extracted included biodata, level of education, employment status, clinical signs and symptoms, as well as the duration of illness. Clinico-pathological features obtained included the anatomical site of the disease, pre-disposing factors, the stage at presentation, the histological cell type, and the histological grade of the disease. The sites of metastases at presentation were determined from records of clinical examinations and imaging investigations done during pre-treatment evaluation.

Data Analysis

The data obtained were analyzed using the Statistical Package for Social Sciences (SSPS) version 20.

Results

A total of one hundred and twenty six cases with histologically diagnosed skin cancer were seen and analysed in this study within the study period. An average of 12.6 cases were seen per year. The highest numbers were recorded in 2008 and 2009 respectively (Figure 1).

The age range of patients was 7 to 98 years with mean age of 46.6 ±3.4.9 (Figure 2).

The male to female ratio was 1.5:1. Most patients were farmers and secondary level education was the highest educational status (Table 1). Trauma was identified as the most common predisposing factor in 23 (18.3%) subjects followed by albinism with 20 (15.9%) (Table 2).

The most common anatomical site affected was the lower limb followed by head and neck, while the thorax and abdomen were affected with equal frequency (Figure 4).

Squamous cell carcinoma was the most common histological type followed by malignant melanoma. The most common presenting complaint was painless swelling. A higher number of patients presented with stage 3 disease. Lung was the most common site of distant metastases followed by liver (Table 3).

Discussion

There was yearly increase in incidence of skin cancer as observed in this study with an average of 12.6 cases seen per year. The incidence of skin cancer in different parts of Nigeria is variable with 12.3% in Zaria[21], 12.7% in Kano[22] and 8% in Calabar[23], however, its relative frequency is much lower than in white populations, where skin cancer accounts for over half (>50%) of all malignancies[24,25]. In our study, low incidences were recorded in 2001–2004 and in 2010. These would have been periods of radiation therapy equipment breakdown at the center during which patients had to go to other centers for treatment. The gender distribution showed a male-to-female ratio of 1.5:1, indicating male predominance in this study. This agrees with previous studies in Nigeria[26, 27]. This higher frequency observed in males than females may be attributable to the fact that males are more likely to be involved in cultivation using farm implements and machinery, which exposes them to repeated trauma to the lower limbs.

In this study, skin cancer occurred more in middle-aged

adults with a mean age of 46.6 years. This is in line with another study in Nigeria that reported that the mean age of skin cancer patients was 43 years[28]. In general, the peak age of incidence varies with the type of cancer, genetic predisposition, and ultraviolet light exposure[29].

A higher number of farmers, 57 (45.2%), were found to be more affected by skin cancer among other occupations in this study. This could be due to chronic ulcers and inflammations that farmers are often exposed to in this region. A previous study of skin cancer from 775 patients in the savannah showed a preponderance of squamous cell carcinoma (SCC) of the leg related to neglected, poorly managed and chronic ulcers or scars from burns or injuries[30]. Farmers are also exposed to pesticides, which have been implicated as risk factors for skin cancers, especially melanoma[31].

A higher proportion of patients had trauma (18.3%) as the predisposing factor, followed by albinism (15.9%) and chemical exposure (15%). Implicated chemicals include polycyclic aromatic hydrocarbons, alkylating agents and nitrosamines[32]. Trauma as a major risk factor in this study is in agreement with reports by Ochicha and colleagues[10] in Kano, Northern Nigeria. This study revealed that albinism is the second most common risk factor for skin cancer. In another study by Opara et al.[14], albinism was shown to be the single most important risk factor in the development of skin cancer in south-eastern Nigeria. These corroborate the report by Kiprono et al.[33], which stated that albinos, especially those living close to the equator, are at high risk of developing skin cancer because of a lack of sun protection. Cigarette smoking and alcohol consumption were also identified as significant risk factors for the development of skin cancer in this study. This agrees with the report of De Hertog et al.[34], who found an association between smoking and squamous cell carcinoma of the skin hence, they proposed that tobacco smoking is an independent risk factor for cutaneous squamous cell carcinoma. Alcohol intake may be linked with a higher incidence of aggressive subtypes of BCC[35]. The mechanism by which smoking promotes skin cancer is said to be unclear; however, it has been proposed that it suppresses immune responses, which may increase skin susceptibility to cancer[36,37]. Again, damage to DNA in skin tissue, leading to errant cell growth, has been theorized as the reason for the increased risk of SCC[38] Furthermore, DNA damage, as well as interference with DNA repair by acetaldehyde, a breakdown product of ethanol, has also been proposed to promote the growth of cancerous cells.

Squamous cell carcinoma (SCC) was the histological type with the highest frequency in our study, which is also the case with a previous report, with 40% being SCC[10].Among Caucasians, however, basal cell carcinoma is the predominant histological type (70–80%)[27], whereas in this report, basal cell carcinoma was found in 16.7% of cases. Malignant melanoma (23.8%) was the second most common histological diagnosis in this study, in line with another study in Nigeria[10]. Overall, the commonest presenting complaint in this study was painless swelling (40.5%), while the least common complaint or symptom was numbness (2.4%). However, symptoms vary with the histology subtypes. According to American cancer society, the most important warning sign of melanoma is a new spot on the skin or a spot that is changing in size, shape or colour[39] whereas SCC can appear as rough or scaly red (or darker) patches, raised growth or lumps, open sores or wart-like growths[40] The presence of nodules is the commonest presenting symptom of basal cell carcinoma of the skin[41].

The most common affected anatomical site in this study was the lower limb (59.5%), followed by the head and neck region (22%). This is in contrast with the report of Subramaniam et al[42], who found that most (40.2%) BCCs were on the head and/or neck and trunk (33.9%); likewise, most SCCs were also on the head and/or neck (33.4%) and upper limbs (34.9%)[42]. This finding of the lower limb being the most common affected anatomical site may be attributed to the observation in this study that farmers are the most affected and trauma is the most common predisposing factor. Farmers are generally prone to having repeated trauma, which leads to wounds and leg ulcers that are usually poorly managed, thereby causing long-standing scars that may eventually undergo malignant transformation.

The greater number of patients presented with stage 3 disease. This agrees with a previous report on skin cancers of the head and neck region in a Nigerian institution that skin cancer patients usually present late with advanced fungating lesions beyond curative surgery[43]. This may be because most of the patients lack knowledge of skin cancer. The proportion of patients that had metastases at presentation in this study was 17%, of which the commonest site of distant metastasis was the lung, followed by the liver. This is in line with a previous report from Tanzania[44]. Reports on the pattern of metastasis from skin cancer in Nigeria are scarce.

Conclusion

This study revealed an increasing incidence of skin cancer among the population studied. It also identified farmers in Nigeria as the occupational group most affected by skin cancer. This is likely attributed to long-standing scars due to repeated trauma, which are usually poorly managed. More so, they are likely exposed to pesticides that can act as co-carcinogens, thus increasing their risk of skin cancer. Albinos were the second group affected by skin cancer. Locally advanced and metastatic diseases were also identified at presentation, which usually leads to poor outcomes. This indicates poor health-seeking behaviors, as skin cancers are in exposed areas and should be easily detected early and treated effectively.

Recommendations

Most patients presented in advanced stages with associated significant morbidity and mortality; therefore, more public enlightenment on skin cancer should be carried out on the need for patients to present to specialists once signs and symptoms of skin lesions persist for more than two weeks. Adequate protective clothing should be emphasized for farmers to protect against repeated trauma and pesticide or chemical exposures. Albinos should be educated on the need to avoid undue sun exposure and encouraged to use protective clothing outdoors. The major limitation of this study is the fact that it was a single-centre, hospital-based study; therefore, we recommend future studies with a multi-centered design, which will be more adequately representative of the clinic-epidemiological profile of skin cancer in the region.

Conflicts of interest

The authors declare no conflicts of interest.

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