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Research Article

Pattern of distribution of AIDS-related Kaposi's sarcoma lesions in HIV patients in a referral hospital in Kenya

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Background: Kaposi's sarcoma (KS) is an angioproliferative malignancy caused by infection with human herpes virus -8 (HHV-8). The tumour has four subtypes including Classic KS, African- endemic, Iatrogenic and Acquired immunodeficiency syndrome (AIDS)-related KS. AIDS- related KS is the most common malignancy in patients with human immunodeficiency virus (HIV) infection and has variable clinical presentation with diverse distribution of lesions.

Objective: To assess the pattern of distribution of KS lesions in patients with AIDS-related KS at Kenyatta National Hospital.

Methods: We carried out a descriptive study on patients with HIV infection with histological diagnosis of KS. The study commenced upon approval by KNH-University of Nairobi Ethics and Research Committee. Following consent, clinical and demographic data was obtained from participants through verbal interviews and from medical records using a data capture form. Follow up was until 10 weeks. Management of patients was at the discretion of the attending clinician. Data was analyzed by a statistician using Instat Biostatistics program.

Results Seventy-four participants aged between 13 to 55 years were enrolled into the study. Males were 42 (56.7%) and females 32 (43.2%). Mean age was 36.8 years. The distribution of KS lesions was variable. We demonstrate high predilection of lesions for skin and lymph nodes at 62.6%. Other sites were involved were the oral cavity 14.9%. Twenty-eight (38%) of the participants had multifocal lesions with a male predominance in skin and viscera with male to female ratio of skin 1.8:1 and viscera 7:1 respectively.

Conclusion: We demonstrate reduced male: female ratio and multifocal distribution of AIDS-related KS lesions with predominance in skin and lymph nodes and male predominance in visceral lesions. Future studies should aim to determine what favours increase in, KS in women and visceral lesions in males among patients with HIV infection.

Keywords: Kaposi's Sarcoma, human immunodeficiency virus (HIV), Acquired Immunodeficiency Syndrome (AIDS)

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1. Introduction

Kaposi's sarcoma (KS) is a spindle cell malignancy caused by infection with human herpes virus 8 (HHV-8). The lesions can involve any site in the body, but cutaneous lesion is the most common initial presentation of KS (Mwanda et al, 2005). There are four variants of KS, each, with distinct clinical

characteristics: Classic KS is an indolent cutaneous disease usually confined to skin of lower extremities mainly affecting old men over 70 years of Jewish ancestry, characterized by purplish plaques and nodules of variable sizes. African Endemic KS was the most common type of KS in Equatorial Africa before HIV epidemic, the tumour involves the lymphoreticullar system, is more aggressive than Classic KS and mainly affects young boys. Iatrogenic KS is common among patients on chronic immunosuppressive therapy following solid allograft transplantation. The tumor regresses on immune reconstitution (Ahmed et al, 2010; Susanna et al, 2016). AIDS-related KS also called epidemic KS, is an AIDS defining illness that was initially described among young homosexual men in 1981. This type of KS mainly involves the lymph nodes, viscera as well as the skin. AIDS-related KS was also the first malignancy to be recognized as an opportunistic malignant sequela of AIDS in resource poor countries, where, combined antiretroviral therapy (cART) drugs are not readily available (Ahmed et al, 2010; Warren et al, 2010).

In resource rich setting, AIDS-related KS is predominantly a disease of homosexual men while in sub-Saharan Africa the male predominance is less pronounced (Warren et al, 2010) and in one study by Emily et al, 2015, the male to female ratio was reversed with male to female ratio of 1:2. In Kenya, AIDS- related KS accounts for 48% of all AIDS defining malignancies (Emily et al, 2015) while in the developed countries, the incidence of AIDS- related KS has declined by more than 70% following the introduction cART . Full remission has been reported in about 50% of patients on cART (Ahmed et al, 2010; Semeere et al 2012; Susanna et al, 2016).

Clinical presentation of AIDS -related KS lesions is variable. The distribution of lesions may range from minimal incidental disease with solitary, localized lesion on the skin to aggressive disseminated visceral disease with significant morbidity and mortality. However, despite the skin and the mucous membranes being the most common initial site at presentation, the lesions may occasionally be absent or missed by the clinician especially in the dark skinned (Susanna et al, 2016, Ahmed et al 2010). Lymph node involvement with KS is common and may be the only clinical presentation of AIDS- related KS and is characterized by multiple lymph node enlargement occasionally with lymphedema (Susanna et al, 2016,). Visceral lesions are notably found in the respiratory system involving trachea-bronchial tree, the lung parenchyma and or the pleura while in the gastrointestinal tract, KS lesions are mainly mucosal and may occur in the absence of cutaneous lesions in up to 80% of patients (Susanna et al, 2016; Xuefeng et al,2018). African and Classic KS lesions tend to involve the peripheral skeleton, whereas AIDS-related KS more commonly involves the axial and/or maxillofacial bones with marrow involvement (Liron and Bruce 2008).

A presumptive diagnosis of KS can be made by observing the characteristic features of the lesion , however biopsy is always recommended to confirm diagnosis and rule out other conditions that may present like KS (Liron and Bruce, 2008, Emily et al, 2015; Susanna et al; 2016, Xuefeng et al,2018).

Therefore, in view of the varied patterns of presentation of AIDS- related KS, we deemed it necessary to assess the pattern of distribution of KS lesions in patients with AIDS -related KS at Kenyatta National Hospital (KNH), a national referral hospital in Kenya. The hospital is in a resource poor setting where most patients are dark skinned and early recognition of lesions, diagnosis and initiation of therapy may be delayed due to masking and socioeconomic challenges.

2. Methods

2.1 Study site

The study was carried out in the Haematology and Radiotherapy Clinics and in adult Medical Oncology Wards at KNH.

2.2 Study design and Study population

The study design was a descriptive study. The target population consisted of HIV infected adult patients above 13 years of age with a histology diagnosis of KS.

2.3 Eligibility criteria

HIV infected patients with a diagnosis of KS attending haematology or radiotherapy clinics or admitted in the medical oncology wards willing to sign consent to participate in the study were eligible for inclusion in the study. Patients with KS in the absence of HIV infection were excluded**.**

2.4 Patient recruitment and data collection

Patient management was at the discretion of attending haematologist or radio- oncologist. Patients were approached as they presented at the haematology or radiotherapy clinics or were admitted into the medical oncology wards for treatment. Following informed consent by patient or guardian for those below 18 years, data was then extracted from the patients' medical records or through verbal interviews.

Data was collected on demographic and clinical characteristics, past medical and surgical history, the anatomic site of the KS lesion, changes observed in the lesion(s), development of new lesions and their distribution during treatment. The treatment protocols for KS were administered weekly or fortnightly for a maximum of four doses, and therefore study participants were followed up for 10 weeks.

2.5 Data analysis

Statistical analysis was performed in Instat Statistical Package for Biostatistics. Descriptive statistics were used to summarize the findings.

2.6 Ethical Considerations

The study was approved by Kenyatta National Hospital - University of Nairobi Ethics and Research Committee (Ref: **KNHERC/01/3111**).

Participant information was anonymized and kept confidential.

3. Results

Seventy-four participants were enrolled into the study. All participants were newly diagnosed of HIV infection and none was on cART. Age ranged between 13 to 55 years, with a mean age of 36.8years and peak age between 31-40 years, Males were 42 (56.7%) and females 32 (43.2%) (**Table 1**).

Twenty-eight (38%) participants had multifocal lesions with variable distribution. Majority (62.6%) of the lesions were found on skin and lymph nodes. Lesions were also found in the oral cavity (14.9%), viscera (10.8%), and oral cavity/skin (4.9%). There was a male predominance in skin and viscera, with male to female ratio of 1.8:1 for skin, and 7:1 for viscera lesions (**Figure 1**).

Table 1: Demographic Data of Participants

Groups		Number (%) N=74
Gender	Male	42 (57)
	Female	32 (43)
Age (yrs)	<-20	4 (5)
	21-30	20 (27)
	31-40	30 (41)
	41-50	15 (20)
	Above 50	5 (7)

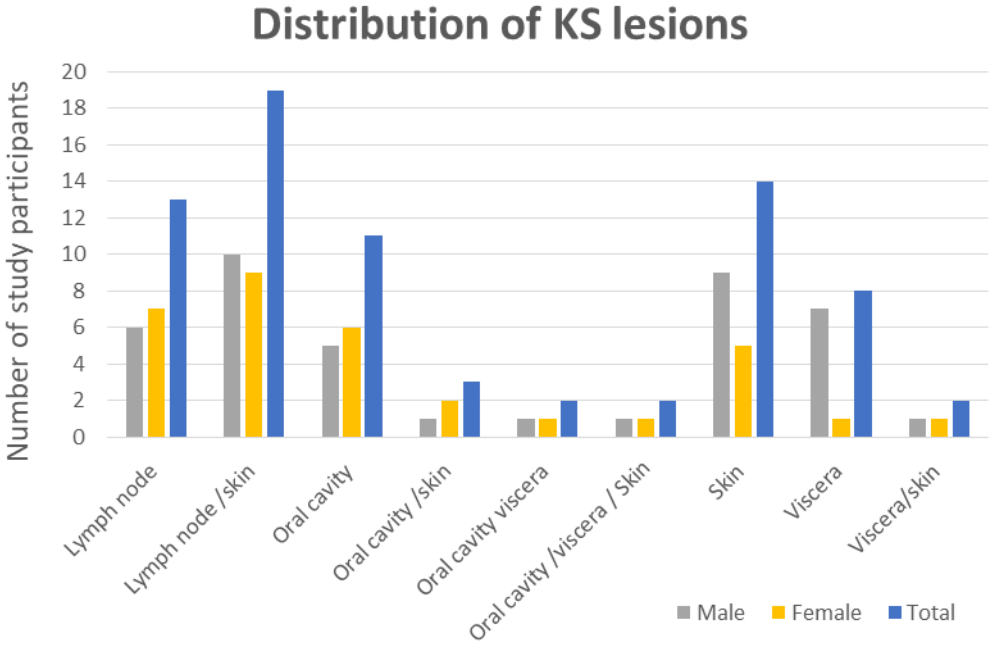

Figure 1: Distribution of the various types of KS lesions

4.0 Discussion

The study demonstrated peak age between 31-40 years and a male to female ratio of 1.3:1. These age parameters were like findings in Nigeria by Adamu et al, 2013. Where they found the peak age was 31-40 years and a male to female ratio of 1.3:1. The peak age is two decades younger than the peak age of endemic KS which is between 50-70 years (Xuefeng et al, 2018). The peak age may correspond to peak age of development AIDS following acquisition of HIV infection during adolescence and young adult life among participants (Louis, 2012). The study demonstrated a decline in male to female ratio which was in keeping with observations in other studies in the world. This decline may reflect the heterosexual nature of transmission of HIV infection or increased frequency of health seeking behavior and testing in female patients. (Adamu et al, 2013; Ahmed et al, 2010; Emily et al, 2015, Warren et al, 2010, Louis et al 2012). However, we cannot rule out undetermined factors favouring acquisition of KS in women with HIV infection. Our demographic findings differ from those observed in China where, mean age was 43 years and male to female ratio was 9:2 (Xuefeng et al, 2018). These differences may suggest an ethnic component in development of KS in HIV infection.

To the best of our knowledge, this was the first study to determine the pattern of distribution of AIDS-related KS lesions in Kenya. We found highly variable distribution of KS lesion with multifocal involvement in 37.8% of the participants, all of whom were dark skinned. The predominant sites of lesion were the skin and lymph node at 62.6%. Findings of this study were in keeping with findings in other studies by Ahmed et al, 2010; Warren et al, 2010; Adamu et al, 2013; Susanna et al, 2016 and Xuefeng et al, 2018 where they found AIDS-related KS lesions were distributed in multiple anatomic sites and mainly on skin and lymph nodes. However, the predominant site of distribution, the skin and lymph node were in sharp contrast to findings reported in a study in Kenya by Emily et al, 2015, where

they found skin involvement was 35%, and viscera 15%. These differences in lesion distribution between our study and that of Emily et al, 2015 may be accounted for by differences in patient population and methodology. The pattern of distribution of AIDS-related KS lesions vary widely compared to the distribution of lesions of endemic KS where the lesions are indolent and mainly confined to the skin (Warren et al 2010, Louis 2012, Susanna et al,2016, Xuefeng et al 2018).

The study also demonstrated male predominance in visceral lesion with a male to female ratio of 7:1. Such observation has not been reported among the publications that we reviewed and we were not able to explain the observation.

A limitation of the study was that the data was largely obtained from the medical records which had been documented by different clinicians whose uniformity of information could not be ascertained.

5.0 Conclusion

We demonstrate a predominant distribution of lesions in skin and lymph node, and a male predominance in visceral involvement. We recommend future studies to determine factors responsible for increase in KS among women with HIV infection and increase in visceral involvement in males.

Conflict of Interest declaration

The authors declare no conflict of interest.

References

Adamu A, Haruna M, Mairo A (2013). Epidemiological and Clinical features of AIDS -Associated Kaposi's sarcoma in Northern Nigeria. *Arch. Int. Surg.* **3:**29-34.

Ahmed A, Muktar HM (2010). Epidemiology and Treatment of Kaposi's sarcoma in HIV-1 Infected Individuals in a Poor Resource Setting. *Curr. Opin. Oncol.* **24**:522-530.

Liron P, Bruce D (2008). Kaposi sarcoma in unusual locations. *BMC Cancer.* **8**:190

Louis-Jacques van Bogaert (2012). Clinicopathological proficiency in the diagnosis of Kaposi's sarcoma ISRN AIDS. http://dx.doi.org/10.5402/2012/565463

Mwanda O, Fu P, Collea R, Whalen C, Remick S. (2005). Kaposi's sarcoma in patients with and without human immunodeficiency virus infection, in a tertiary referral centre in Kenya. *Ann. Trop. Med. Parasitol.* **99**:81-91.

Phipps W, Ssewankambo F, Nguyen H, Saracino M, Wald A, Corey L, Orem J, Kambugu A, Casper C (2010.) Gender differences in clinical presentation and outcomes of epidemic Kaposi sarcoma in Uganda. *Plos One*. **5**:e13936

Rogena EA, Simbiri KO, Falco GD, Leoncini L, Ayers L, and Nyagol J (2015). A review of the pattern of AIDS defining, HIV associated neoplasms and premalignant lesions diagnosed from 2000–2011 at Kenyatta National Hospital, Kenya. *Infect. Agents Cancer*. **10**:1-7.

Semeere A, Busakhala N, Martin N (2012) Impact of Antiretroviral Therapy on the Incidence of Kaposi's Sarcoma in Resource-rich and Resource-limited Settings (PDF). *Curr. Opin. Oncol.* **24**:522-530.

Susanna L, Rebecca R, David J, Gary B, Andrew E, Marco S, Michael S (2016). HIV-1 Evolutionary Patterns Associated with Metastatic Kaposi's sarcoma during AIDS. *Sarcoma.* https://doi.org/10.1155/2016/4510483

Xuefeng W, Xiabo Lu, Maimaitiali W, Palida A (2018) Clinical features and prognosis of Kaposi's sarcoma in Urumchi, China. *Int. J. Exp. Med*. **11**:5829-5837.