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Original Research Article

Incidence of HIV among herpes zoster patients in Khartoum Dermatology and Venereal Diseases Teaching Hospital from April 2018 to April 2019

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ABSTRACT

Background: Herpes zoster (HZ) results from reactivation of latent varicella-zoster virus and is associated with ageing and impaired cell-mediated immunity, including HIV infection. Aim was to estimate the proportion of HIV-positive patients among Sudanese adults presenting with HZ.
Methods: A prospective, hospital-based cross-sectional study was conducted at Khartoum Dermatology and Venereal Disease Teaching Hospital from April 2018 to April 2019. Sixty adults with clinically diagnosed HZ were enrolled and screened for HIV using rapid diagnostic kits. Demographic and clinical information was collected using a structured questionnaire.
Results: The participants had a mean age of 37.1±9.9 years; 29 (48.3%) were male and 31 (51.7%) were female. Thirty-one participants (51.7%) were aged 25-45 years. The trunk was the most frequent rash site, occurring in 35 participants (58.3%). Twenty-five (41.7%) reported headache and/or fever during the prodromal period. All 60 participants tested negative for HIV. Prodromal symptoms were significantly associated with rash distribution ($p<0.001$).
Conclusions: No HIV infection was detected in this sample of patients with HZ. The result should be interpreted cautiously because of the small sample size and single-centre design. Larger studies from several Sudanese regions are needed.

Keywords: HIV, Herpes zoster, Dermatology

INTRODUCTION

Herpes zoster (HZ), also known as shingles, is caused by reactivation of latent varicella-zoster virus in sensory ganglia.[1,2] The risk of HZ increases with age, particularly after 50 years, as cell-mediated immunity declines.[1,3] Immunosuppressive conditions, including HIV infection, malignancy, transplantation and immunosuppressive treatment, also increase the risk of reactivation.[1,4]

HZ has been described as a clinical clue to HIV infection, especially when it occurs in younger adults, is recurrent, disseminated or involves multiple dermatomes.[5,6] However, the predictive value of HZ varies according to the background prevalence of HIV, the age distribution of patients and access to testing.[7] Evidence syntheses identify HIV/AIDS as an important risk factor for HZ, while age remains one of the most consistent risk factors in the general population.[1,8]

HZ also imposes a substantial burden of disease worldwide, including complications such as post-herpetic neuralgia, which further underscores the importance of identifying modifiable and non-modifiable risk factors.[9] Data describing the relationship between HZ and HIV in Sudan are limited and previous local observations have been inconsistent.[10] A previous hospital-based study from Khartoum reported HIV seropositivity in 15% of patients presenting with HZ.[10] This study therefore estimated the proportion of HIV-positive patients among adults presenting with HZ at Khartoum Dermatology and Venereal Disease Teaching Hospital and described their demographic and clinical characteristics.

METHODS

Study design and setting

This was a prospective, descriptive, hospital-based cross-sectional study conducted at Khartoum Dermatology & Venereal Disease Teaching Hospital, Sudan, from April 2018 to April 2019.

Participants

The study included 60 adults aged 18 years or older with a clinical diagnosis of HZ who provided informed consent. Patients with incomplete records, those who declined consent and patients with a known HIV diagnosis before enrolment were excluded.

Data collection and HIV testing

Demographic and clinical data were collected using a structured questionnaire. Blood samples were screened using the SD HIV-1/2 3.0 rapid test. A reactive result was to be confirmed using KHB Colloidal Gold and Trinity Biotech Uni-Gold kits. In this study, all screening results were non-reactive.

Statistical analysis and ethics

Data were analysed using SPSS version 22. Categorical variables were summarized as frequencies and percentages, and age was summarized as mean±standard deviation. Associations between categorical variables were assessed using the chi-square test; $p<0.05$ was considered statistically significant. The protocol was approved by the Ethics Committee of the Arab Board of Health Specializations, and informed consent was obtained from all participants.

RESULTS

Sixty patients were included. The mean age was 37.1±9.9 years. Females constituted 31 (51.7%) of the participants and males 29 (48.3%). Most participants were aged 25-45 years, and 44 (73.3%) lived in Khartoum State. Twenty-three participants (38.3%) reported travel outside Sudan.

Table 1: Demographic characteristics of the study participants.

Characteristics	N	Percentage (%)
Age, mean±SD (in years)	37.1±9.9	-
<25	11	18.3
25-45	31	51.7
Other age group(s)	18	30.0
Male	29	48.3
Female	31	51.7
Resident of Khartoum State	44	73.3
Resident of another state	16	26.7
Travel outside Sudan	23	38.3
No travel outside Sudan	37	61.7

The trunk was the most common rash distribution, followed by the head and limbs. Headache and/or fever were reported by 25 (41.7%) patients. The reported analysis found a significant association between prodromal symptoms and rash distribution ($p<0.001$); no statistically significant association was reported between rash distribution and the demographic variables.

Table 2: Clinical characteristics of the study participants.

Clinical characteristics	N	Percentage (%)
Rash on trunk	35	58.3
Rash on head	18	30.0
Rash on limbs	7	11.7
Headache and/or fever	25	41.7
No headache/fever reported	35	58.3
HIV screening non-reactive	60	100.0
HIV screening reactive	0	0.0

Because no participant tested positive for HIV, the observed HIV positivity proportion was 0/60 (0%). A confidence interval was not calculated in the original analysis; therefore, the finding should not be interpreted as proof that HIV is absent among all patients with HZ in Sudan.

DISCUSSION

The principal finding of this study was that none of the 60 patients with HZ tested positive for HIV, giving an HIV seropositivity proportion of 0%. This finding contrasts markedly with the 15% HIV seropositivity reported by Abdalla et al in a previous study conducted at the same hospital in Khartoum, in which 6 of 40 HZ patients were HIV-positive.[10] The discrepancy between the two studies may reflect differences in sample size, recruitment period, referral patterns, patient age

distribution, clinical severity of HZ presentations, local HIV epidemiology, and testing practices. The earlier study was conducted in a different time period, and changes in HIV awareness, testing availability, and patient referral pathways over time may have contributed to the observed difference. Furthermore, studies from other settings have reported even higher HIV seropositivity rates among HZ patients; a hospital-based cross-sectional study from India reported HIV seropositivity in 32.3% of HZ patients.[11] The wide variation in reported HIV seropositivity among HZ patients across different populations underscores the importance of local epidemiological context in interpreting HZ as a marker for HIV infection.

The absence of HIV-positive participants in the present study does not contradict the established association between HIV and HZ. A meta-analysis by Marra et al found that HIV/AIDS significantly increased the risk of HZ compared with controls, with a pooled relative risk of 3.22 (95% CI 2.40-4.33).[8] Similarly, Kawai and Yawn reported that immunosuppression, including HIV infection, was among the strongest risk factors for HZ in their systematic review.[1] Current HIV clinical guidance reports that HZ incidence was more than 15-fold higher in people with HIV before antiretroviral therapy and remains approximately three- to fourfold higher in the era of effective therapy.[6] These findings support HIV testing when HZ occurs in a patient with relevant clinical or epidemiological risk, but they do not imply that every patient with HZ will have HIV.

The mean age of participants in this study was 37.1±9.9 years, with 51.7% aged 25-45 years and only 18.3% younger than 25 years. Population studies consistently show that HZ incidence increases with age, rising sharply after 50 years, as cell-mediated immunity declines.[1,3,7] Forbes et al in a large population-based case-control study, confirmed that age is one of the most important risk factors for HZ, with incidence increasing steadily from middle age onward.[4] The relatively young mean age in the present study may partly explain the absence of HIV infection, as older age is associated with both higher HZ incidence and greater cumulative exposure to HIV. However, the manuscript does not provide the number of participants aged over 50 years, and the study had no non-HZ comparison group; therefore, age-specific incidence rates cannot be calculated. The results can appropriately be described as the age distribution of HZ patients in this hospital sample rather than evidence that age was the strongest risk factor.

Females represented 51.7% of participants and males 48.3%, yielding a near-balanced sex distribution. This finding is consistent with several epidemiological studies that have reported a slightly higher incidence of HZ among women. Kawai and Yawn, in their systematic review and meta-analysis, found that women were at increased risk of HZ compared with men, with a pooled adjusted relative risk of 1.31 (95% CI 1.27-1.34).[1] Marra et al similarly reported female sex as a risk factor for HZ in their meta-analysis.[8] However, the present study provides only frequencies among patients attending one hospital and therefore cannot estimate sex-specific incidence. Comparisons with population-based studies require appropriate denominators and adjustment for age and comorbidity.

The trunk was the most frequent rash site in the present study, accounting for 58.3% of cases, followed by the head at 30.0% and the limbs at 11.7%. This finding is consistent with previous clinical studies that have reported thoracic dermatomes as the most commonly affected site in HZ. Abdul Latheef and Pavithran, in a clinical study of 205 patients, found that the thoracic dermatome was the most commonly affected segment (42.4%), followed by cranial (28.2%) and cervical (12.1%) regions.[12] Nair et al similarly noted that the cutaneous presentation of HZ is characteristically centripetal, with thoracic and lumbar dermatomes most frequently involved.[13] The predominance of truncal involvement in the present study is therefore consistent with the known dermatomal distribution of HZ. However, direct comparison with studies reporting ophthalmic, disseminated or multidermatomal disease requires the same anatomical definitions to be used.

Prodromal symptoms, including headache and/or fever, were reported by 41.7% of participants in the present study. This is consistent with the known clinical presentation of HZ, which is characteristically preceded by a prodrome of fever, malaise, and localized pain.[2,13] Weaver, in a comprehensive review of the burden of HZ, described prodromal symptoms as a common feature preceding the rash by several days.[2] The reported association between prodromal symptoms and rash distribution was statistically significant in this study ($p<0.001$). Nevertheless, the manuscript does not provide the cross-tabulation or cell counts, so the magnitude and clinical relevance of this association cannot be fully assessed. The corresponding contingency table should be added if this analysis is retained in future reports.

Travel outside Sudan was reported by 38.3% of participants, while 73.3% lived in Khartoum State. These variables are descriptive and do not establish a relationship with HIV infection or HZ because no comparison group and no multivariable analysis were included. The single-centre recruitment also limits generalizability to other Sudanese regions, particularly areas with different healthcare access, migration patterns or HIV prevalence.

The study has several limitations. The sample was small, so a low HIV prevalence could have been missed. The hospital-based design may introduce referral and selection bias. The cross-sectional design estimates HIV positivity among the enrolled patients but not population incidence. CD4-cell counts, antiretroviral exposure, recurrence, dissemination, multidermatomal involvement

and important comorbidities were not reported. Finally, the comparison with the earlier Khartoum study is limited by differences in study design and recruitment period.[10] These limitations should temper the statement that HZ is not a reliable indicator of HIV infection in Sudan.

Overall, the findings indicate that HIV was not detected in this particular sample of patients with HZ. They support continued clinical assessment and HIV testing according to national guidance and individual risk, while highlighting the need for larger, multicentre studies with age-stratified analyses, complete clinical characterization, HIV confirmatory algorithms and CD4-cell data.

CONCLUSION

No HIV infection was detected among the 60 adults with HZ enrolled at this hospital during the study period. This result is compatible with the known association between HIV and HZ but should not be generalized to all Sudanese patients because of the small, single-centre sample. Multicentre studies with larger samples and more detailed clinical and immunological data are warranted.

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