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Seroprevalence of Human Herpesvirus-8 (HHV-8) among Children Attending an Emergency Room in South-Eastern Nigeria

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Summary

Ikpatt OF, Ekanem EE, Calabro L, Ogon PM, Chieco-Bianchi L. Seroprevalence of Human Herpes virus-8 (HHV-8) among Children Attending an Emergency Room in South-Eastern Nigeria *Nigerian Journal of Paediatrics* **2002; 29:14**. The seroprevalence of Human herpesvirus-8 (HHV-8) was studied in 56 children aged two to 14 years. Subjects were children seen consecutively in the Children Emergency Room of the University of Calabar Teaching Hospital in January 2000. Sera from the children were screened for antibodies to the small capsid related protein encoded by ORF 65 (Lytic antigen) by the ELISA technique and Latency Associated Nuclear Antigen (LANA) by the immunoflourescent assay. Of the 56 children, 42 (76.9 per cent) had antibodies to at least, one of the antigens. The rate of infection correlated positively with age ($r= 0.45$; $p<0.002$), with a double peak of 90 per cent and 85 per cent at ages five to seven and 11-14 years, respectively. Infection was also highest in children from low socio-economic background. It is concluded that the prevalence of HHV-8 is high among children in this environment, sexual route of transmission is unlikely, and that low socio-economic status, and possibly crowding, are important parameters associated with the infection. The role of droplets in the transmission of HHV-8 should be investigated.

Introduction

HUMAN herpesvirus-8 (HHV-8) or Kaposi Sarcoma Associated Herpesvirus (KSHV) is a recently described member of the family of gamma herpes viruses that is associated with all of the described epidemiological variants of Kaposi sarcoma (KS).[1,2] HIV infection and residence in Africa are known risk factors.[3] HHV-8 seropositivity is 2.4 per cent in North European, South-eastern Asian and the US populations compared to a frequency of approximately 10 per cent in the Mediterranean countries. In Africa, seroprevalence of 5.1 per cent and 3.0 per cent have been documented in the sub-Saharan countries of Zambia[4] and Gambia.[5] The mode of transmission of HHV-8 remains unknown, although homosexual sex has been suggested.[3] Despite the high prevalence of HIV and clinicopathological evidence of high rate of KS in Nigeria,[6,7] no reports of the seroprevalence of HHV-8 have been documented in the country This study was designed to determine the seroprevalence of HHV-8 among children in the south-eastern Nigeria. The parameters that may be associated with the infection were also examined.

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Subjects and Methods

A total of 56 children seen consecutively at the Children Emergency Room (CHER) of the University of Calabar Teaching Hospital (UCTH) between January 1 and 31, 2000 were enrolled in the study. Informed consent was obtained from parents and the older children for the additional three millilitres of blood that was required. Demographic data obtained included the age, sex and socio-economic status of the parents. The subjects were classified into social class 1 (elite), class II (middle), and class III (low) as recommended by Olusanya *et al*[8] for developing countries. Three ml of blood was obtained from each child during routine investigations. The sera were separated by centrifugation and frozen at –20°C before shipping for analysis at the Oncology Unit of the Padua University, Italy. Sera were screened in a dilution of 1:100 for antibodies to the small capsid related protein encoded by ORF65 (Lytic antigen) using the ELISA technique.[2] Immunoflourescent assay for the latency associated nuclear antigen (LANA) was also done as

previously described.[2] Mean absorbance of negative sera was 0.04 + 0.015 and SD ranged from 0.005 to 0.015, which remained comparable using 10 negative sera from Italian blood donors. Purified recombinant dehydrofolate reductase (DHFR) was used as a control antigen. Sera showing reactivity to only the DHFR portion of the recombinant ORF65 portion by ELISA was considered non-specific.

Simple proportions and tables were used to analyse the data. The chi-square (χ^2) test and Pearson's correlation (r) test were used to determine statistical significance of difference.

Results

Fifty-six children aged two to 14 years, with a median of seven years, were studied. Nineteen children (33.9 per cent) had antibodies to both the ORF65 and LANA. Forty-two children had antibodies to at least one of the antigens giving an overall prevalence rate of 76.8 per cent in this population. The seroprevalence rate increased from 60.0 per cent at the age group 2-4 years to 90.0 per cent at 5-7 years. Another peak of 85.7 per cent occurred at the age group 11-14 years (Table I). Prevalence correlated positively with age ($r= 45$, $p<0.002$).

Of the 32 males, 25(78.1 per cent) were positive while 18 of the 24 females (75.0 per cent) were positive. The difference was not significant ($\chi^2 = 0.49$, $p> 0.25$). Distribution by social class is shown in Table II. The rate was lowest among children from the elite social class and reached 100 per cent among those from the lowest social class (Table II); the difference was significant ($\chi^2 = 29.13$, $p<0.001$)

Discussion

The childhood population was chosen not only to determine seroprevalence level which hitherto had not been studied, but also to determine the dynamics of infection in a Nigerian population. While it may be argued that these were sick children, manifestations of acute HHV-8 infections are known.[9] The population studied may therefore still be representative of the general childhood population in this area. The overall prevalence of 76.8 per cent of HHV-8 in this childhood population is higher than the 27.5 per cent recorded among children and adolescents in neighbouring Cameroun,[10] the 24.1 per cent among adults in Italy, and the 2.7 per cent among blood donors in the United Kingdom.[11] It therefore seems that there is a high rate of transmission of HHV-8 among children in this environment. The higher prevalence in the present study compared to the neighbouring Cameroun may reflect the much higher population density in Nigeria.

The high rate of HHV-8 at this age range, particularly at early and middle childhood, could not be by the sexual route. The double peak at 5-7 years and 11-14 years correspond to the ages at entrance to primary and secondary schools respectively and may suggest crowding as a factor in transmission. It is interesting to note that infection was lowest among children from the elite socio-economic background, reaching 100 per cent in those of the low socio-economic group. This again, suggests environmental factor(s), possibly crowding.

The high prevalence of HHV-infection among children in south-eastern Nigeria would thus appear to be linked

Table I

Seropositivity to Different Antigens of HHV-8 (ORF65 and LANA) by Age

Age (Yrs)	*No Tested*	*ORF65*	*LANA*	*At least One Antigen*	*Percent with at least One Antigen*
2-4	15	4	8	9	60.0
5-7	20	13	14	18	90.0
8-10	14	7	7	7	71.0
11-14	7	4	5	6	85.7

$r=0.45$; $p< 0.002$

Table II

Prevalence of HHV-8 Seropositivity by Social Status

Social Class	*No Tested*	*No Positive*	*Percentage Positive*
I (Elite)	14	4	28.6
II (Middle)	18	15	83.3
III (Low)	24	24	100

$\chi^2 = 29.13$; $p<0.001$

to low socio-economic status and possibly crowding. It would therefore, be desirable to investigate the role of droplets in spreading the infection.

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