

## Original Article

### Are the Preventive Services For HHV-8 Necessary in HIV Positive Persons in Central Zone of Iran?

Mohsen Meidani<sup>1</sup>, Zohreh Aminzadeh<sup>2</sup>, Mahya Faghieh<sup>1</sup>, Nooshin Ahmadi<sup>3</sup>

1. Dept. of Infectious Diseases, Isfahan University of Medical Sciences, Isfahan, Iran

2. Dept. of Infectious Diseases, Shaheed Beheshti University of Medical Science, Tehran, Iran

3. Dept. of Internal medicine, Isfahan University of Medical Science, Isfahan, Iran

#### ABSTRACT

**Background and Objective:** It is presumed that human herpes virus 8 (HHV-8) is the necessary cause of all different forms of Kaposi's sarcoma which is the most common neoplasm in HIV-infected persons. In this study, we wanted to determine the prevalence of HHV-8 infection in all the available Isfahan (Central of Iran) HIV positive individuals in comparison with healthy blood donors, and also investigating the risk factors of HIV infections in both groups.

**Material and Methods:** In this cross sectional study, the samples were consisted of 50 healthy HIV –negative blood donors and all the available Isfahan HIV positive individuals (55 persons). The selected people fulfilled a questionnaire about personal demographic information. The blood samples were examined using Biotrin kit to detect anti HHV-8 antibody (IgG).

**Results:** In HIV positive group, 10 persons (18.2%) tested positive for HHV-8, but none of the control group had positive test. We analyzed risk factors for AIDS and found, as expected, strong associations between HIV infection with addiction, being in prison, travelling out of Iran, low educational status and being single or having multiple sexual partner but there is no differences between HHV-8 positive and negative group.

**Conclusion:** The prevalence of HHV-8 in HIV positive persons is high in Isfahan and preventive care may be beneficial. A future study including a large population from different high risk groups and general population in Iran is needed in order to define seroepidemiology and risk factors associated with HHV-8 infection.

**Keywords:** HHV-8, HIV, Iran

---

Received: 16 March 2013

Accepted: 21 Jul 2013

Address Communications to: Dr. Nooshin Ahmadi, Department of Internal medicine, Isfahan University of Medical Sciences, Isfahan, Iran.

Email: nooshin\_ahmadi@yahoo.com

## Introduction

The acquired immune deficiency syndrome (AIDS) is a widespread disease caused by human immunodeficiency virus (HIV) and nowadays the prevalence of this syndrome has risen. It may be due to the increasing number of infected subjects and increasing life expectancy due to anti retroviral therapy (1). It is suspected that 40% of HIV positive persons will develop cancer, especially Kaposi's sarcoma (KS) and non-Hodgkin's lymphoma (2). Kaposi's sarcoma is one of the most frequent tumors in immunocompromised patients (3) and the most common neoplasm in HIV-infected individuals (4).

In 19th century, classic KS was described in Eastern Europe for the first time as a malignant vascular proliferation that involves the skin and deep tissues (5, 6). The most common presentation is cutaneous involvement as bluish-reddish maculae or nodules in the distal lower extremities (7). KS can involve other organ such as oral cavity, gastrointestinal tract, liver, spleen, lymph nodes, kidneys, and lungs (6). Kaposi's sarcoma classified into the 4 groups due to clinical and epidemiological manifestation: 1) Classic KS, 2) African-endemic KS, 3) Iatrogenic KS, 4) Epidemic or AIDS-associated KS (8). Kaposi's sarcoma associated herpes virus (KSHV) a member of the gamma herpes virus group was discovered in epidemic KS tissues by Chang et al in 1994(9). KSHV, also known as human herpes virus 8 (HHV-8), is the necessary cause of all different forms of KS.

Numerous epidemiological surveys have been done to define the prevalence of HHV-8 infection, but they showed variable results. It may be due to differences in the populations in different geographic area and serological diagnostic method. It is most prevalent in sub-Saharan Africa and less prevalent in other countries in Europe and Asia. Many studies have been performed to identify the HHV-8 transmission risk factors. Some of these distinguished risk factors are transfusion

of blood products infected with HHV-8, being homosexual, having multiple sexual partners. HHV-8 virus can be transmitted through body fluids such as blood and its products, saliva, semen and vaginal secretion and organ transplantation. (10)

In Iran, limited studies have been done to assay the seroepidemiology of HHV-8 in general population and HIV positive persons, so we want to determine the prevalence of HHV-8 infection in all the available Isfahan HIV positive individuals in comparison with healthy blood donors, and also investigating the risk factors of HIV infections in both groups.

## Method and Material

In this cross sectional study which is performed in 2010-2011; the samples were consisted of both healthy HIV –negative blood donors (50 persons) from blood donor center and all the available Isfahan (Central of Iran) HIV positive individuals (55 persons) who were referred for follow up to “navab safavi consultant center”. HIV infection was documented using western blot test in this group. The patients who were not satisfied to participate in the study and those who have immunosuppressive disease other than being HIV –positive, were excluded. The study was approved by the medical university's Ethics Committee of Isfahan University of Medical Sciences.

All the selected people fulfilled a questionnaire about personal demographic information including; age, sex, sexual behavior, sexual partnership during last 6 months, homosexual behavior, being a drug abuser, history of blood transfusion, tattooing etc. The patients' information were gathered and compared between two groups. The blood samples obtained from both HIV –positive and HIV –negative group, were centrifuged and keep in -20 centigrade degree until doing serological test, HHV-8 IgG EIA test was done using Birtin kit (Birtin, Ireland) to detect anti HHV-8 antibody.

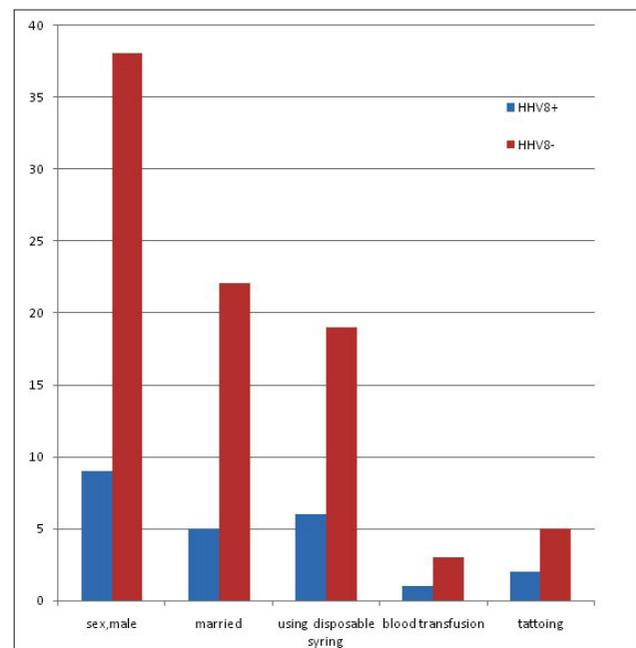
## Data analysis

Statistical analysis was performed using SPSS for windows (Version 16.0, 2007, SPSS Inc, Chicago, IL, USA). The Student *t*-test (for continuous variable) and Chi square test (for categorical variables) were used to compare variables and to evaluate associations between HIV and HHV-8 positivity and associated factors. Statistical significance was assessed at the 0.05 probability level in all analyses. All the values are given as mean±standard deviation (mean±SD) or numbers (%).

## Results

Totally, 55 HIV positive and 50 healthy persons were evaluated. In HIV positive group, 10 persons (18.2%) tested positive for HHV-8, but none of the control group had positive test. There was a significant difference between two groups ( $P$  value<0.001). The mean of age in HHV-8-infected and non infected samples, was  $38\pm 8$  and  $36.6\pm 9$  years old, respectively ( $P$  value=0.66). The HHV-8 infection prevalence between study's male and female was 19.1% and 12.5% respectively with no significant difference. No significant relation between HHV-8 infection and marital status was seen. In the questionnaire, we asked about drug abuser. The maximum and minimum duration of addiction was 1 and 20 years, respectively. The mean time was  $8.53\pm 4.63$  years. In HHV-8 positive patients the mean time was  $6.3\pm 3.6$  and in non infected patients, it was  $9.2\pm 4.7$ . So no significant relationship between HHV-8 infection and being addiction was seen. The mean age of beginning drug abuser was  $19.2\pm 3.9$  in rang of 15 to 37 years old. From 40 addicted persons, 25 persons (62.5%) mentioned the use of "single use" syringe, and 15 persons had used syringe in partnership. HHV-8 prevalence in these two group was 24% and 20% ( $P$  value=0.99). 43.6% of the HIV infected persons had the history of being in prison but only 4% of healthy persons have the same experience, fisher test shows significant relation between being in prison and

HIV infection ( $P$  value<0.001). Another risk factor was having multiple partner, 30 patients (54.5%) from HIV group and 5 persons (10%) from control group had multiple sexual partner. There was significant relationship between HIV infection and having multiple sexual partner ( $P$  value<0.001). In HIV positive group, 71% of the people were using condom as preventive care, but 57.1% of people in healthy group used it. History of blood transfusion was another item we assessed. In HIV group, 4 persons (7.3%) had history of blood product transfusion, one of them had received whole blood and 3 persons other blood products. HHV-8 infection was seen in 25% of patients with the history of blood transfusion and in 17.6% of persons without such history. In healthy control group there was not any history of blood transfusion. In HIV and healthy group, tattooing prevalence was 12.7 and 4 percent respectively, but 7 HIV infected patient had tattooing on body surface; HHV-8 prevalence in the patient with or without tattooing was 28.6% and 16.7%. It shows no significant relation between tattooing and HHV-8 infection. Figure 1 shows comparison of some characteristics between HHV-8+ and HHV-8- patients in HIV+ group.



**Fig.1:** Comparison of some characteristics between HHV-8+ and HHV-8- patients in HIV+ group

The mean of CD<sub>4</sub> count in HIV persons in this study was 407±269, with the maximum and minimum count of about 1082 and 9. The mean of CD<sub>4</sub> count in HHV-8 positive persons was

464±256 and in negative persons was 393±274. T student test shows no significant differences between these two groups. Some of the participants' characteristics are shown in Table 1.

**Table 1-** The characteristics of study participants are shown

Characteristics And Risk Factors	Healthy Blood Donors (n=50)	Total HIV + (HHV-8+,HHV-8-) (n=55)
Mean age	36.3±9.1	37±8.7
Sex(male)	46	47
Married	41(82%)	21(49.1%)*
Unemployed	0	24(43.6%)*
Illiterate	0	3(5.5%)
University education	15(30%)	2(3.6%)*
Living in city	22(44%)	36(65.5%)
Travelling out of Iran	0	6(10.9%)*
Drug abuse	0	40(72.7%)*
Being in prison	2	24*
Having multiple sexual partner	5(10%)	30(54.5%)*

\*=there was significant differences between two groups ( $P<0.001$ )

## Discussion

Seroepidemiological studies show that the prevalence of human herpes virus 8 (HHV-8) infections varies in various countries. The infection is less frequent in northern Europe, North America, and most part of Asia, but is more prevalent in parts of South America and Mediterranean area. It is most prevalent in sub-Saharan Africa (10). HHV-8 is seen in immunodeficient persons but it is an uncommon infection in healthy adult. It is obvious that, in HIV infected populations; seroprevalence of HHV-8 is more than healthy general population.

In our study, in HIV positive group 18.2% showed positive test for HHV-8, but none of the participant in control group had positive test. It shows that HHV-8 is not a common human pathogen in general population of Isfahan. We also analyzed risk factors for AIDS and found, as expected, strong associations with addiction,

being in prison, travelling out of Iran, low educational status and being single or having multiple sexual partner but there is no differences between HHV-8 positive and negative group.

No association was found between the presence of HIV antibodies and having unprotected sex, tattoos, blood transfusions, job and living place.

In Iran, limited studies have been done to assay the seroepidemiology of HHV-8 in general population and HIV positive persons. One study, in Tehran by Gharehbaghian *et al.* showed that only 2% of healthy Iranian blood donors and in the HIV positive group 45.7% were positive for HHV-8(11). HHV-8 prevalence among blood donors in Iranian population was 2% whereas in HIV positive patients, was 45.7 % (5).

In Africa, in general population the HHV-8 seroprevalence is 20% while it has been reported in lower rates from 0–20% from countries in Europe and North America. In a study by Ogoina *et al.* it revealed a HHV-8 seroprevalence rate of

62% in HIV infected adults without Kaposi's sarcoma and 25.9% in HIV negative adults in Zaria, northern Nigeria (12). In India and Thailand seroprevalence of HHV-8 in HIV-positive populations is much lower than in the USA and Africa (13).

### Conclusion

According to data from our study we can suggest that the prevalence of HHV-8 in HIV positive persons is high in Isfahan and preventive care such as blood screening in HIV positive persons may be beneficial. A future study including a large population from different high risk groups and general population in Iran is needed in order to define seroepidemiology and risk factors associated with HHV-8 infection.

### Acknowledgements

The authors declare that there is no conflict of interest.

### References

1. Longo D, Fauci A S, Kasper D, Hauser S, Jameson J, Loscalzo J. Harrison's principle of internal medicine 18th ed. New York:McGraw-Hill; 2012.
2. Cesarman E, Chang Y, Moore PS, Said JW, Knowles DM. Kaposi sarcoma-associated herpes virus-like DNA sequences in AIDS-related body cavity based lymphomas. *N Engl J Med* 1995; 332(18):1186-91.
3. Lazzi S, Bellan C, Amato T, Palumbo N, Cardone C, D'Amuri A, *et al.* Kaposi's sarcoma-associated herpesvirus/human herpesvirus 8 infection in reactive lymphoid tissues: a model for KSHV/HHV-8-related lymphomas. *Hum Pathol* 2006;37(1):23-31.
4. Gnann JW, Pellett PE, Jaffe HW. Human herpesvirus 8 and Kaposi's sarcoma in persons infected with human immunodeficiency virus. *Clin Infect Dis* 2000;30 Suppl 1:S72-6.
5. Jalilvand S, Shoja Z, Mokhtari-Azad T, Nategh R, Gharehbaghian A. Seroprevalence of Human herpesvirus 8 (HHV-8) and incidence of Kaposi's sarcoma in Iran. *Infect Agent Cancer* 2011;28:6:5.
6. Landau HJ, Poiesz BJ, Dube S, Bogart JA, Weiner LB, Souid AK. Classic Kaposi's sarcoma associated with human herpesvirus 8 infection in a 13-year-old male: a case report. *Clin Cancer Res* 2001;7(8):2263-8.
7. Dongre A, Montaldo C. Kaposi's sarcoma in an HIV-positive person successfully treated with paclitaxel. *Indian J Dermatol Venereol Leprol* 2009;75(3):290-2.
8. Schwartz RA, Micali G, Nasca MR, Scuderi L. Kaposi sarcoma: a continuing conundrum. *J Am Acad Dermatol* 2008;59:179-206.
9. Ahmadpoor P, Ilkhanizadeh B, Sharifzadeh P, Makhdoomi K, Ghafari A, Nahali A, *et al.* Seroprevalence of Human Herpes Virus-8 in Renal Transplant Recipients: A Single Center Study From Iran. *Transplant Proc* 2007;39(4):1000-2.
10. Dukersa NH, Rezza G. Human herpesvirus 8 epidemiology: what we do and do not know. *AIDS* 2003;17(12):1717-30.
11. Gharehbaghian A, Zaghali A, Farhudi Langerudi M, Karimi GH. Seroepidemiology of the human Herpesvirus (HHV-8) in the haemodialysis patients blood donors and HIV-positive individuals in City of Tehran. *Journal of School of Public Health and Institute of Public Health Research* 2006;4(4):57-62.
12. Ogoina D, Onyemelukwe G, Musa BO, Babadoko A. Seroprevalence and determinants of human herpes virus 8 infection in adult Nigerians with and without HIV-1 infection. *Afr J Health Sci* 2011;11(2):158-62.
13. Ablashi D, Chatlynne L, Cooper H, Thomas D, Yadav M, Norhanom AW, *et al.* Seroprevalence of human herpesvirus-8 (HHV-8) in countries of Southeast Asia compared to the USA, the Caribbean and Africa. *Br J Cancer* 1999;81(5):893-7.