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Letter to the Editor

Prevalence of infection by HHV-8, HIV, HCV and HBV among pregnant women in Burkina Faso

Human Herpesvirus-8 (HHV-8), the most recent member of the herpesviruses, has been invariably associated to Kaposi's sarcoma (KS) a mesenchymal tumour whose incidence has recognised a steep increase in the early 1980's in concomitance with the pandemy of human immunodeficiency virus (HIV) type I infection (Cook-Mozaffari et al., 1998). Epidemiological surveys have shown that HHV-8 infection is not ubiquitous. The highest prevalence rates of HHV-8 infection in the general population have been registered in Africa, reaching in some areas 40–70% (Engels et al., 2000a; Dedicoat and Newton, 2003). It has been also observed that HIV prevalence and AIDS associated KS incidence reach the highest levels in Africa, although not uniformly distributed throughout the continent (Dukers and Rezza, 2003). A review of the literature showed that, in the sub-Saharan Africa, Burkina Faso is one of the countries less characterised for prevalence of viral infections. The epidemiological surveys carried out so far have described that HIV, Hepatitis B virus (HBV) and Hepatitis C virus (HCV) infections rates are quite similar to those registered in bordering regions of Western Africa (Ilboudo et al., 2002; Buvè et al., 2002; Madhava et al., 2002). So far, no data are available on HHV-8 infection in Burkina Faso. In the present report we analysed the diffusion of HHV-8 in sera obtained from pregnant women attending antenatal visits at the Centre Médical Saint Camille (CMSC) and the Centre d'Accueil et Solidarité de Ouagadougou (CASO), two central institutions for care of pregnant women and HIV infected people, respectively, in Ouagadougou, the capital city of Burkina Faso, in a period of about 2 years. Furthermore, we evaluated HHV-8 prevalence and its correlation with the HIV infection status as well as the prevalence of HBV and HCV infections in the screened population.

Determination of HIV status of the assayed samples was performed by Enzyme Immuno Assay (EIA) technique, using a commercial kit (Abbott Laboratories S.A, France). HHV-8 serostatus was assessed by screening antibodies to viral lytic antigens in the collected samples. The analysis was carried out by means of the two tests most widely used in HHV-8 serodiagnosis: an immunofluorescence assay (IFA) and an EIA using the HHV-8 K8.1 protein as antigen. IFA was determined on BC-3 cells, an HHV-8 positive cell line, treated with 20 ng/ml of 12-tetradecanoylphorbol 13-acetate to induce HHV-8 lytic cycle. EIA was undertaken using bacterially produced K8.1 protein purified by chromatography as previously described (Engels et al., 2000b). To analyse HCV infection, we screened sera for antibodies to HCV antigens, whereas, to identify subjects with an active infection by HBV, we tested sera to detect the viral marker hepatitis B surface antigen (HBsAg). In both these cases, sera were assayed by an inter second antibody immunoassay (Huma-Tech House rapid test, Germany). For statistical analysis all the data were recorded on computer file and evaluated by standard software SPSS-10 and EpiInfo-6. Statistical significance was set at $P < 0.05$.

Initially, the HIV-1 serostatus of 963 women attending an antenatal visit at the CMSC, aged 18–44 years, was evaluated: 75/963 (7.8%) were HIV positive. HIV rate of infection significantly increases with age, ranging from 1.8% among 15–19 years old women to 11.5% in 35–44 years old patients ($P = 0.030$). To enlarge the group of HIV positive individuals to be analysed for potential co-infection with HHV-8, HBV and HCV, we decided to include in the study 33 women affected by AIDS who were receiving medical care at the CASO. Subsequently, for the HHV-8, HCV and HBV tests we invited 429 pregnant women (321 HIV negative, 75 HIV positive and 33 AIDS patients), available from the above group, who freely agreed to be screened for these viral infections.

In the assayed group 49/429 (11.4%) subjects turned out HHV-8 seropositive. The prevalence rate tends to increase from 7.7% in the group aged 15–19 years to 13.6% in the 35–44 years old subjects, although the risk of being infected during adulthood does not seem particularly relevant. Moreover, HHV-8 infection rate was weakly affected by the HIV status of the subjects: 33/321 (10.3%) HHV-8+/HIV− compared to 9/75 (12%) HHV-8+/HIV+. In the group of AIDS patients HHV-8 prevalence was higher: 7/33 (21.2%) of the individuals screened were found HHV-8 seropositive, however, the difference registered with the HIV negative women was not statistically significant ($P = 0.062$). As of HBV infection, 40/429 (9.3%) subjects were infected by HBV at the moment of blood collection, as documented by the presence of HBsAg in the serum. HIV serostatus had a low effect on the rate of HBV infection; in the present survey, 26/321 (8.1%) of the HIV negative subjects were found infected by HBV compared to 9/75 (12%) of the HIV positive individuals. A higher HBV infection rate was observed among the AIDS patients 5/33 (15.1%), however, the difference was not statistically significant ($P = 0.148$). Furthermore, 26/429 (6.1%) subjects of the assayed population were

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found HCV seropositive. HIV serostatus seemed to affect the HCV prevalence rate: the percentage of HCV seropositive subjects almost doubled in the HIV positive individuals compared to the HIV negative (5.6 versus 10.7%), however, this difference was not statistically significant ($P = 0.095$).

The present study has been the first attempt to evaluate HHV-8 prevalence in Burkina Faso. Interestingly, the infections rates for HIV, HBV and HCV found in this survey are in line with those reported in other studies carried out in the country (Ilboudo et al., 2002; Ilboudo et al., 2003). The present epidemiological screening seems to suggest that Burkina Faso is a country with an intermediate level of HHV-8 infection in the population, certainly lower than that reported in other sub-Saharan countries (Dukers and Rezza, 2003). Since HHV-8 is a necessary co-factor in KS development, the relative low HHV-8 prevalence presumably plays an important role in determining the low KS incidence observed in Ouagadougou, as documented by a previous report that registered overall 29 KS cases in patients admitted in the 5 years 1992–1996 in a major hospital in Ouagadougou (Barro-Traore et al., 2003). Indeed, the concordance at local level between HHV-8 prevalence and KS incidence has been described in epidemiological surveys carried out in other areas.

Thus far, the reasons for the uneven geographical distribution of HHV-8 infection and KS worldwide are largely unknown and environmental, genetic, lifestyle factors have been suggested to be involved. In Africa, HHV-8 infection is characterised by the highest rates in the general population, particularly in the equatorial regions, and by an early primary infection by HHV-8, during childhood or adolescence, thus suggesting that routes of transmission, alternative to the sexual contact, are frequently involved in the spreading of the infection. It is now established that infectious HHV-8 is released in saliva in healthy seropositive individuals, although it is unknown the mechanism through which the virus, shed in the saliva, might reach target cells (Koelle et al., 1997; Pauk et al., 2000). A theory for an alternative pathway of transmission from mother to child of viral infections through saliva has been recently proposed (Coluzzi et al., 2003). In this hypothesis, the infection frequently takes place during childhood and is favoured by the bite of hematophagous arthropods as a promoting factor and the application of saliva containing infectious virus by the parents, to heal the itching and scratching at the site of the bite, as a risk behaviour. If this transmission route actually plays a role in HHV-8 infection, then the local density of biting arthropods would be an important factor. At this purpose, it should be considered that the Ouagadougou area has a relatively dry climate if compared to the equatorial African countries characterised by higher rates of HHV-8 infection. The difference in the climate reflects also the density of insects, which is sensibly lower in the Ouagadougou area than that registered in the above mentioned countries. In any case, further epidemiological studies still need to be carried out to validate this hypothesis. Finally, the present study has been performed on a group of pregnant women and 42 of them were found to be HHV-8 seropositive before delivery. It should turn out interesting to analyse the serostatus of their infants, in particular comparing the prevalence rate of the newborns from HHV-8 seropositive mothers versus those seronegative, and at the same time, how this correlates with the transmission of HIV or HBV and HCV from seropositive mothers.

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