

Letters to the Editor

HHV-8 transmission via saliva to soothe blood-sucking arthropod bites

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Sir,

We refer to the letter by JM Wojcicki (2003), which is an interesting contribution towards attempts to elucidate risk factors for transmission of the human herpesvirus 8 or Kaposi's sarcoma-associated herpesvirus (HHV-8/KSHV). The author emphasises the prevalence of nonsexual intrafamilial horizontal transmission, the frequent seroconversion in childhood and the probable role of saliva, which in about 15–20% of infected individuals contains measurable HHV-8 loads. In a large mother–child transmission study in South Africa, very high viral copy numbers in maternal saliva have been found to be associated with transmission to the child (Dedicoat *et al*, 2004). Wojcicki lists a series of cultural and medicinal practices involving the exchange of saliva as documented in the Human Relations Area Files (HRAF, 1997) at Yale University. Using this database, she reports on traditional rituals of socioanthropological interest but does not highlight a common and global use of saliva, which is to soothe blood-sucking arthropod bites, the ancestral human behaviour that some of us have recently hypothesised to play a key role in HHV-8 transmission (Coluzzi *et al*, 2002). The important consideration here is that the local immune response to the arthropod bite, resulting in skin reactions like swelling and itching, which foster the application of HHV-8-containing saliva (by spitting, licking or sucking, or by smearing saliva over the arthropod bite site), could promote infection by the virus since HHV-8 is known to infect several cell types involved in inflammation, for example, macrophages, B cells and endothelial cells. An arthropod able to provoke a strong inflammatory response would thus have the greatest potential to promote HHV-8 transmission ('promoter arthropod hypothesis'; Coluzzi *et al*, 2002). In support of this hypothesis, we

have recently reported a suggestive evidence of a decrease in HHV-8 seroprevalence in age cohorts born in Sardinia during the larviciding campaigns aiming at the eradication of the malaria vector *Anopheles labranchiae* in the early 1950s (Coluzzi *et al*, 2003). Incidentally, *A. labranchiae*, like most malaria vectors well adapted to humans, may not be a typical promoter, but living in marshland habitat it would rather act as marker of an environment eventually producing promoter insects like *Ochlerotatus caspius*, *Coquillettidia richiardii* and *Aedes vexans*. Other potential promoter insects are, in the Mediterranean area, sand flies (*Phlebotomus* spp), biting midges (*Culicoides* spp and *Leptocnops* spp) and, perhaps more important, black flies (*Simulium* spp). Glossinids (tze-tze flies) and Tabanids (horse flies) could also be relevant in promoting HHV-8 transmission in Africa.

Whether any one of the human practices using saliva, as highlighted by JM Wojcicki, is involved in HHV-8 transmission remains a fascinating question. One may extend the hypothesis that application of saliva to wounds, or the use of saliva in preparing medications applied to wounds, is a route for HHV-8 transmission. We believe that future studies aimed at understanding the impact of living conditions, cultural or medicinal practices, on HHV-8 transmission should be designed such as to investigate this hypothesis by including appropriate questionnaires. Since HHV-8 infection in African children may be associated with hepatitis B virus (HBV) infection (Mayama *et al*, 1998), and given the reported link between insect (*Simulium buissoni*) bites and the rate of HBV infection in a holoendemic island of the Marquesas archipelago, French Polynesia (Chanteau *et al*, 1993), the promoter arthropod could have a much wider relevance.

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Reply: HHV-8 transmission via saliva to soothe blood-sucking arthropod bites

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Sir,

I thank M Coluzzi *et al* for their interest in my letter published in 2003 on traditional behavioural practices and exchange of saliva among sub-Saharan African populations. The comments by M Coluzzi *et al* on my letter highlight a potentially important behavioural practice associated with human herpesvirus 8 (HHV-8) transmission; the use of saliva to soothe blood-sucking arthropod bites. As mentioned in my letter, I found some evidence of this practice in reviewing ethnographic material from the Human Relations Area Files (HRAF). However, neither the extent nor frequency of saliva-associated behavioural practices, including those highlighted by Coluzzi *et al*, has been investigated among sub-Saharan African populations. The HRAF files present only descriptive, ethnographic data. Scientifically oriented epidemiological studies need to be developed to better characterise the frequency and distribution of saliva-associated behavioural practices and evaluate the potential association between these practices and risk of infection with HHV-8.

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The 'promoter arthropod' hypothesis raised by Coluzzi *et al* (2002) concerning the use of saliva to soothe blood-sucking arthropod bites merits further investigation and may pertain to transmission of other viruses in addition to HHV-8. In their letter, Coluzzi *et al* discuss ecological data from a previous study Coluzzi *et al* (2003), suggesting a relationship between larviciding campaigns and decreased population HHV-8 seroprevalence in Sardinia. Although this ecological level data is intriguing, the association may be confounded by other time-dependent environmental or behavioural factors, and individual level studies are needed to test this hypothesis. In addition, in light of widespread infection with HHV-8 in diverse sub-Saharan African environments, ecological level analysis may be less informative in this context. Studies that assess the frequency of behavioural practices associated with saliva including treatment of insect bites and exposures to proposed environmental risk factors (e.g. the density of 'promoter arthropods') at the individual level are needed.

Coluzzi M, Manno D, Guzzinati S, Tognazzo S, Zmbon P, Arca B, Costantini C, Ascoli V (2002) The bloodsucking arthropod bite as possible cofactor in the transmission of human herpesvirus-8 infection and in the expression of Kaposi's sarcoma disease. *Parasitologia* 44: 123–129

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