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 Evaluation of WHO clinical criteria for AIDS in HIV-2 endemic region

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To evaluate the performance in Senegal of the provisional WHO clinical criteria for AIDS in developing countries, we surveyed suspected cases referred for serologic testing to Prof. Mboup's laboratory from 1986 to the present. Cases suspected of AIDS had at least 2 of the major or minor signs in the WHO criteria.

<i>Results :</i>	<i>Suspected AIDS-like illness</i>	<i>WHO criteria fulfilled</i>	<i>% Suspected AIDS like cases fulfilling WHO criteria</i>
<i>Serostatus</i>			
HIV-1	19	17	89.5
HIV-2	14	9	64.3
Both	4	3	75.5
Neither	61	24	39.3
<i>Total</i>	98	53	54.1

*Conclusions :* 1) The high rate of seronegative "AIDS" cases (almost half of all cases fulfilling the criteria) makes the evaluation of AIDS solely by these criteria difficult in this region. 2) The larger number of HIV-1 associated AIDS cases is of interest, considering that HIV-1 is less prevalent than HIV-2 in this region. 3) Extensive clinical surveys and perhaps distinct clinical criteria may have to be considered to survey disease association and HIV-2 exposure.

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 Antigenic analysis of HIV-1 and HIV-2 for diagnosis, prognosis, epidemiology studies and vaccine development

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While HIV-1 is present primarily in the USA, Europe, and Central Africa, HIV-2 is present primarily in West Africa. The risk for development of AIDS following persistent infection with HIV-1 is high. The risk for development of AIDS following infection with HIV-2 is unknown but probably considerably lower than for HIV-1. For both viruses, serologic tests for blood bank screening can be done most efficiently using the antigens gp120, gp41, p24, and the pol gene products p64/53 and p31. Antibodies to gp120 and gp41, are more often type specific than antibodies to p24, p64/53 and p31. Thus, the gp120 and gp41 are more useful for distinguishing between HIV-1 and HIV-2. Ideally, the two gene products that are unique for HIV-1 and HIV-2, p16<sup>u</sup> and p12<sup>x</sup> can be used for distinguishing between the two viruses. However, antibodies to p16<sup>u</sup> are present in only about one third of infected individuals except at the earliest point of exposure, when antibodies are present in 90 %. Antibodies to p12<sup>x</sup> are present in about 85 % of the virus-exposed individuals.

For prognostic evaluation, antibodies to p24 (gag), p23 (sor) p37 (3'orf) p19 (art), and p16 (U) are most useful. For p24, p27 and p23, levels of antibodies drop at the time of clinical AIDS. For p19, antibodies are most prevalent just before clinical AIDS develops. For p16, antibodies are most prevalent at the earliest stage of infection. For gp120, antibodies to antigenic domains in the non-reduced form (gp120<sup>NR</sup>) are present throughout infection and may even rise at the time of clinical illness. For the reduced or denatured gp120 (gp120<sup>R</sup>), antibodies are substantially more likely to be present in healthy HIV-infected individuals and lost at least 18-24 months before development of AIDS.

It is the latter domains, which are presented primarily in the carboxy terminus region of gp120 especially in peptide 434C, that should be considered most seriously for vaccine development.

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Preliminary survey of HTLV-1 in Senegal

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We surveyed sera from various groups of individuals in 5 cities in Dakar for antibodies to HTLV-I utilizing indirect immunofluorescence (IFA) as our screening technique and a Western blot antigen preparation of HTLV-1 as our confirmatory assay. The groups surveyed included a total of 799 prostitutes, 186 patients hospitalized for neurologic problems, 682 patients hospitalized for other reasons including tuberculosis and leprosy, 153 pregnant women or women visiting family planning clinics and 581 control sera from a previous health survey.

One large group of prostitutes in Dakar showed a 3.1 % prevalence (9 of 288 sera) when positive IFAs were confirmed by Western blot. Only one other positive IFA was confirmed by Western blot to be positive in the remainder of the sera tested. Although tropical spastic paraparesis has been reported in Senegal associated with HTLV-1 seropositivity, we conclude that the overall seroprevalence of HTLV-1 is low and perhaps more prevalent in Dakar than in the other major cities in Senegal

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Ability of HIV-1 ELISAs to detect HIV-2 positive sera

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We conducted the following study to determine the ability of various commercial HIV1 ELISA assays to detect HIV-2 positive sera. 734 serum samples representing 8 different West African countries were first analyzed by immunoblot to HIV-1(HTLV-3B) and HIV-2 (289 and MS) strains. 346 of the serum samples were HIV-2 positive and there was 100 % concordance between reactivity to the viral antigens of HIV-2 (289) and HIV-2 (MS). The results of HIV-1 ELISA assays were as shows :

	<i>ABBOTT</i>	<i>GENETICS</i>	<i>DUPONT</i>
Cross-reactivity to HIV-2 (n = 346 HIV-2+)	83.8 %	84 % <sup>1</sup>	82.4 %
False positives (n = 397 HIV-2-)	18.9 %	18.0 %	10.1 %

\* Roughly equal number of HIV-2 positive. and negative samples from each geographic location were included.

Of the 346 HIV-2+ samples, 95.1 % were detected by at least 1 of the ELISA ..... 85.8 % of the positives were detected by at least 2 of the assays. These (.....) show that there is no difference in reactivity of samples to HIV-2 (289 or (MS) strains. Further, all 3 HIV-1 ELISAs were able to detect approximately 83 % of the HIV-2 positive samples. The false positive rate for all ELISAs assays was high on West African immunoblot negative sera.

*IIIrd International Conference on AIDS and associated Cancers in Africa, Arusha 1988, p. 56.*

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Dynamics of HIV-2 and HIV-1 in a high risk group in Senegal

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A cohort of 1 165 female prostitutes visiting the Institut d'Hygiène Sociale in Dakar, Senegal were studied from early 1985 to the present. The majority of these women were native Senegalese (73 %), 22 % were from Ghana and 5 % were from other ethnic groups. The mean age was 34 yrs, range = 21-68 yrs. Serodiagnosis of HIV-2 and HIV-1 was performed by immunoblot on 2 363 samples from this cohort. On women observed more than once, 892 person-years of observation have been collected, with a mean of 21 months observation.

The present seroprevalence of the cohort is 10.8 % HIV-2, 0.9 % HIV-1 and 0.2 % HIV-1/HIV-2. The age-specific HIV-2 prevalence increases with age, in contrast to the age-specific prevalence of HIV-1 ; indicative of a virus present in this population for at least several decades. Over the three year period of observation the rate of seroconversion was 2.6 % for HIV-2 and 0.25 % for HIV-1. Current studies on HIV-2 infected individuals from this area have failed to indicate that HIV-2 is as virulent as HIV-1. It has been suggested that this may be due to recent introduction of this virus and rapid spread. This data indicates a relatively slow spread of transmission in this HIV-2 endemic area, further evidence that the virulence of HIV-2 may differ from HIV-1.

*IIIrd International Conference on AIDS and associated Cancers in Africa, Arusha 1988, p. 22. Abstract PS.5.4*

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HIV-1 and HIV-2 in blood donors and MST patients in Dakar

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HIV-2 was first discovered in Dakar, Senegal in 1985, where studies have demonstrated significant rates of HIV-2 infection. Blood bank screening for HIV-1 and HIV-2 began in mid-1987. The seroprevalence for patients visiting a sexually transmitted disease clinic was determined this year and compared to our results in 1985-86 from the same clinic population. All samples were confirmed by immunoblot on HIV-1 and HIV-2 antigens.

Group	n	HIV-2 %	HIV-1 %	HIV-1/2 %
Blood donors 1987-88	4 194	0.57 %	0.02 %	0.0 %
MST patients 1985-86	141	0.7 %	1.4 %	0.0%
MST patients 1988	263	1.9 %	1.5 %	0.4 %

Our results indicate that HIV-2 is the more prevalent virus in healthy blood donors similar to our previously published results. This is similar to results in female prostitutes where HIV-2 seroprevalence (10.8 %) is 10-fold higher than HIV-1 seroprevalence (0.9 %). In male MST patients , the seroprevalence for both HIV-1 and HIV-2 were more similar and surprisingly low. Over the 3 year period of observation an increase in HIV-1 was not observed but a doubling of seroprevalence for HIV-2 was shown. These results indicate that further study of risk groups and their risk factors are needed. This information will be critical to design and implementation of prevention and control programs for

both HIV-1 and HIV-2.

*IIIrd International Conference on AIDS and associated Cancers in Africa, Arusha 1988, p. 99. Abstract FP.19*

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Epidemiology and clinical evaluation in a cohort of prostitutes exposed to HIV-2

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Since July 1987 we have established a cohort of 140 prostitutes residing in Ziguinchor (South of Senegal). By frozen sera we know many of them were seropositives for two years. All these prostitutes were attending on STD clinic, with a monthly visit for clinical evaluation.

At enrollment 42 % of the prostitutes were HIV-2 infected (HIV-2+). HIV-2+ was associated with the *age of the prostitute* and the *cost of the sexual encounter*. But *no significant association* was found between HIV-2 status and the duration of the prostitution, immunization, injection, previous operation, transfusion, scarification.

For the clinical examination the results will be presented and discussed.

*IIIrd International Conference on AIDS and associated Cancers in Africa, Arusha 1988, p. 102. Abstract FP.25*

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Perinatal transmission of HIV-2 in Senegal

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The seroprevalence of HIV-2 in pregnant women in various urban centers in Senegal was determined by immunoblot on HIV-2 and HIV-1 antigens.

City	# of samples	HIV-2 %	HIV-1 %
Pikine	220	0.4 %	0 %
Louga	184	1 %	0 %
Ziguinchor	550	1 %	0 %

Paired serum samples from mothers and heel-prick blood samples dried on filter paper from their infants (age = 1-24 months) were analyzed by immunoblot for antibodies to HIV-2 and HIV-1. 3 of 92 mother-infant pairs were found to be HIV-2 positive, none were HIV-1 positive. There was 100 % concordance between HIV-2+ mothers and HIV-2+ infants. Clinical and immunologic studies of HIV-2+ infants will be discussed.

These studies indicate that filter-paper eluates may be an effective means of detecting seropositivity in infants. This technique is a cost-effective means of surveillance for perinatal retroviral transmission in endemic areas.

*IIIrd International Conference on AIDS and associated Cancers in Africa, Arusha 1988, p. 91. Abstract FP.3*

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## Prospective follow-up of HIV-2 exposed individuals

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Since 1985, female prostitutes registered in an STD clinic in Dakar who are HIV-2 seropositive have been seen and medically followed for health care. These women were matched with seronegative prostitutes (1:2 matching ratio) by age ( $\pm 2$  years), by nationality and by initial year of registration in the clinic ( $\pm 2$  years).

From the date of known serologic status, 92 HIV-2 seropositive prostitutes have been matched with 180 seronegative prostitutes.

	Mean Age	Mean Yrs. in clinic	Total Person years observed
HIV-2 N=92	37	6.8	94
Negative N=180	36	6.5	268

There has been no generalized lymphadenopathy ( $>1$ cm in two sites), oral candidiasis, or ARC signs or symptomatology in either group. The overall incidence rates of medical problems between the groups has been similar.

Updated data concerning the health status of this HIV-2 exposed cohort will be given. To date, the health status of this cohort is encouraging.

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Antibodies to HTLV-1 in 3340 pregnant women sera from West Africa, Martinique and migrant women population living in France

Limoges-Martinique-Lomé-Abidjan-Dakar-Tours

HTLV-1 antibody prevalence was examined in pregnant women from Ivory Coast (814), Mali (63), Niger (61), Senegal (281), Togo (565), Martinique (716) and from foreign pregnant women living in France (840).

HTLV-1 antibodies were determined by :

— Indirect immunofluorescence and ELISA using HUT 102 clone B2 cells

— Western Blot using the same strain, and RIPA with MT 2 cells for uninterpretable sera by WB.

*Results :*

— prevalence rate : 1.34 % for subsaharan African women, with a higher level in Ivory Coast (1.84 %) 2.34 % for Martinique women

— negative results for all foreign women living in Limoges.

A correlation was found with age : higher levels were found for women more than 40 years old (2.4 %) in West Africa, and between 30-39 years old in Martinique (3.9 %).

The prevalence observed poses HTLV-1 screening problem not only in blood donors, but also in pregnant women. A serological survey during pregnancy could prevent milk transmission which is known to be an important mode of transmission for HTLV-1.

*IIIrd International Conference on AIDS and associated Cancers in Africa, Arusha 1988, p. 107. Abstract FP.34*

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HIV-1 and HIV-2 in Benin

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A serosurvey of select control and: high risk individuals were sampled in Cotonou, Benin. All samples were analyzed by commercial ELISA and confirmed with immunoblot on HIV-1 and HIV-2 antigens. 923 individuals were sampled in May 1987, male : female ratio = 1.55.

<i>Population group</i>	<i>n</i>	<i>HIV-1 %</i>	<i>HIV-2 %</i>
Female prostitutes	133	4.5 %	3.7 %
Male prostitutes	11	0.0 %	0.0 %
Tuberculosis patients	106	1.8 %	0.0 %
Hospital patients	128	0.1 %	0.0 %
Prisoners	200	0.0 %	0.5 %
Military personnel	100	1.0 %	0.0 %
Pregnant women	83	0.0 %	0.0 %
Blood donors	36	0.0 %	0.0 %

Our results indicate that the seroprevalence of HIV-1 and HIV-2 is rare in non-risk groups from Cotonou. Of select risk groups, female prostitutes showed increase risk for infection with either HIV-1 or HIV-2. Only 1 of 11 HIV seropositive female prostitutes was Beninois, all others were of different geographic origin. It is hoped that this surveillance data will be useful in planning prevention and control programs to limit the spread of retroviral infection.

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Abstract FP.18