

J P Gonzalez

DSCAR1/jpg/AJG/paper AAR/07.97

Running title: AIDS in the Central African Republic

Paper resulting from the IIIrd International Conference on AIDS held in Washington in June 1987 and submitted to "Archives of AIDS Research"

by,

AJ Georges, MC Georges-Courbot, PMV Martin, CCM Mathiot,  
JL Lesbordes, M Merlin, F Barré-Sinoussi and JP Gonzalez

30 JAN. 1991

ORSTOM Fonds Documentaire  
N° : 31.261 ex1  
Cote : B

11 p42

## SERO-SURVEY OF AIDS IN THE CENTRAL AFRICAN REPUBLIC

AJ Georges(1),MC Georges-Courbot(1),PMV Martin(1),  
CCM Mathiot(1),JL Lesbordes(2),M Merlin(3),F Barré-  
Sinousssi(4) and JP Gonzalez(1,5).

(1) Pasteur Institute, BP 923, Bangui, Central African Republic;  
(2) Centre National Hospitalo-Universitaire, Bangui, CAR ; (3)  
Organisation de Coordination pour la lutte contre les Grandes  
Endémies en Afrique Centrale, Yaoundé, Cameroon; Institut  
Pasteur, Paris; (5) Institut Français pour le Développement  
et la Recherche en Coopération, Bangui, CAR.

## SUMMARY

From 1983 to 1987 a continuous serosurvey for HIV-1 antibodies has been conducted in the Central African Republic. Various populations were investigated, as general and randomized populations from urban and rural areas, and selected risk groups. Overall prevalence in the CAR varies from 0% in the rural areas to 2.5-7.8% in the large cities. In Bangui, the capital, a significant increase in seropositivity has been observed: 2.1% in 1985 to 7.8% in 1987. Several risk groups have been identified as prostitutes (over 20% of HIV-1 antibody positive), patients with tuberculosis (6 to 40% positive) and malnourished children (4 to 12%).

## INTRODUCTION

Epidemic manifestations of AIDS have been observed and documented in Africa since the late 1970's (7,9,10) and human infection demonstrated as early as 1959 (8). The epidemiology of the disease in Africa differs from that of

AIDS in the developed world and especially the USA and Europe, as transmission occurs almost only through heterosexual activity (7,1,2).

Occurrence of AIDS in the Central African Republic (CAR) has been well documented by studying both prevalence of Human Immunodeficiency Virus type 1 (HIV-1) or LAV/HTLVIII antibodies and by recording the number of AIDS cases since 1983 (3,6).

We present in this study a broad serosurvey conducted since 1985 in CAR on randomly selected individuals and risk populations.

#### PATIENTS AND POPULATION UNDER SURVEY

Study populations came from both urban and rural areas. Urban participants are from Bangui and its suburbs; rural populations are from four districts of the CAR: The Vakaga, situated in the dry northern savannah part of the country; the two districts of Lobaye and Sangha included in the Congo-guinean rain forest massif in the Southern part, and in the sub-sudanese savannah zone, the middle size city of Bambari from the Ouakka district, 300 km East of Bangui.

Serum samples were taken between January 1983 and April 1987. Population groups were randomly selected households using a cluster sampling technique previously described by Henderson and coll.(5). At-risk or "suspected-at-risk" groups were selected on the basis of predefined factors, such as people attending the hospital and Pasteur Institute in Bangui, or presenting either clinical or

biological signs of a syndrome of immunodeficiency. On the other hand, preliminary studies pointed out certain groups as risk populations: prostitutes, patients with tuberculosis and malnourished children.

#### METHODS

Interviews were made by qualified medical staff and geographical origin, age, sex and sexual behavior were documented. Blood samples taken on the field were processed at the Pasteur Institute in Bangui.

Antibodies against HIV-1 were detected in sera using a commercially available enzyme linked immunosorbent assay (ELAVIA, Pasteur Diagnostic). The positive sera were confirmed by Western Immunoblotting (LAV Blot, Pasteur Diagnostic) and / or, in some cases, early in 1985, by Indirect Immunofluorescent test on both MoltC and H9 HIV1 infected cells.

#### RESULTS

Out of 8693 serum samples, 6448 were from Bangui and its suburbs, 2245 were from rural areas. Of these, 988 belong to risk populations.

As seen in Table 1 and 2, the seroprevalence in the general population varies regarding the date of sampling and geographic origin of peoples tested.

As seen in Table 3, patients were hospitalized for AIDS in intensive care units, and a striking proportion of hospitalized children were seropositive; Table 4 confirms

that prostitutes and malnourished children and their mothers belong to risks groups, while tuberculosis patients seem to behave differently according to their clinical pattern.

#### DISCUSSION

In Bangui, the antibody survey in the general population shows an increase of prevalence from 1985 to 1986 monitoring the randomly selected samples (5). In the class age of 15-44 years old, from 1985 to 1987 we observed a two-fold increase of seroprevalence per year from 2.1% in 1985 to 7.8% in 1987 (Table 1).

If we compare results on Table 1 and 2, the main feature is a higher prevalence rate in large and medium cities (Bangui, 450,000 inhabitants; Bambari, 50,000 inhabitants) than in remote rural areas.

In the rural area the HIV-1 seroprevalence remains low or inexistent; This reflects a low level of endemicity with sporadic spread of the virus, likely from the urban hyperendemic area. This is shown by the prevalence increase between 1986 and 1987 in Bambari (Table 2), an important rural city where large population exchanges with Bangui exist.

There is no significant difference between the two population from the forest (Pygmy or Ubanguian) with a low level of antibody prevalence. Nevertheless we described recently the first clinical case of AIDS in pygmy indicating the possible spread of the virus into an untouched area (4).

The relatively high prevalence of antibody showed in the

hospitalized peoples in the intensive care unit is the result of a selection of clinical cases of AIDS. This was done on purpose at the early stage of our study, in order to identify all AIDS cases attending the hospital, then evaluate the incidence in this selected population and give special care and medical surveillance to the patients (Table 3).

Due to the significantly higher antibody prevalence rate in prostitute, risk factors such as other sexually transmissible disease, rate of multiple infections, and sexual behavior are under investigation.

Malnourished children and their mothers present a higher antibody prevalence than the ones observed in the general population. The highest rate observed in Bangui compared to Bossangoa reflects the general urban-rural differences.

These couples of infant/mother, after inquiries, are of low social economic status, which explains their malnutrition. We suspect it also indicates a more permissive sexual attitude with multiple sexual partners.

In conclusion, circulation of HIV-1 within the CAR population was shown to be important with prevalence rates moving from 0% in the rural area to 3.8% in a middle size city, to 7.8% in Bangui, the capital. Heterosexual spread of HIV-1 was already confirmed as the major path of infection (2,3).

Our results allow a better understanding of the dramatic spread of HIV-1 in CAR and should help to develop an

efficient preventive program for AIDS.

## REFERENCES

1. Biggar RJ, Johnson BK, Oster C and coll.. 1987, Regional variation in prevalence of antibody against Human T Lymphotropic virus types I and III in Kenya, East Africa. Int. J. Cancer., 35:763-767
2. Clumeck N, Van de Perre O and Carael M..1985, Heterosexual promiscuity among African patients with AIDS. N. Engl. J. Med., 313:182
3. Georges AJ, Lesbordes JL, Meunier DMY, Vohito MD, Gonzalez JP, Guetard D, Chamaret S, Bensimon G., Klatzman D and Montagnier L, 1985, Antibodies to LAV in various population groups of the Central African Republic. Ann. Virol. Inst. Pasteur, 136E:323-325
4. Gonzalez JP, Georges-Courbot MC, Martin PMV, Mathiot CC, Salaun D and Georges AJ. 1987, True HIV-1 infection in Pygmy, Lancet, I:124
5. Henderson RH, Sundaresan T, 1982, Cluster sampling to assess immunization coverage. A review of experience with a simplified method. Bull. WHO, 60:253-260
6. Lesbordes JL, McCormick JB, Beuzit Y, Ramiara JP, Vohito MD, Meunier DMY, Georges MC, Gonzalez JP and Georges AJ, 1985, Aspects cliniques du SIDA en République Centrafricaine. Med. Trop.:404-411
7. Piot P, Quin TC, Taelman H, and coll., 1984, Acquired immunodeficiency syndrome in a heterosexual population in Zaire, Lancet, ii:65-69

8. Nahmias AJ, Weiss J, Yao X and coll., 1986, Evidence for human infection with HTLV III/LAV like virus in Central Africa. Lancet, i:1279-1280

9. Van de Perre P, Rouvroy D, Lepage P and coll., 1984, Acquired Immunodeficiency Syndrome in Rwanda, Lancet, ii: 62-65

10. Vittecoq D, Roue RT, Rey F, Cherman JCP and coll. 1987, Acquired Immunodeficiency Syndrome after travelling in Africa: an epidemiological study in seventeen caucasian patients, Lancet, ii:612-614

Table 1: HIV-1 ANTIBODIES PREVALENCE  
IN RANDOMIZED URBAN POPULATIONS FROM  
BANGUI, CENTRAL AFRICAN REPUBLIC

YEAR	AGE/RANGE	TOTAL	PERCENTAGE OF POSITIVE	
1985	15-44	323	2.1	1.4
1986	15-44	941	4.0	1.5
1987	15-44	383	7.8	1.4
1986	1-14	336	0.0	

Table 2: HIV-1 ANTIBODY PREVALENCE IN RANDOMIZED RURAL POPULATIONS OF THE CENTRAL AFRICAN REPUBLIC

LOCATION	AGE GROUPS	ETHNIC GROUP	TOTAL	%
VAKAGA(1986)	5 - 65	Chari-Nil	226	0
LOBAYE(1985)	15 - 65	Pygmy-Aka	143	0
LOBAYE(1986)	15 - 65	Pygmy-Aka	163	0
LOBAYE(1987)	15 - 65	Pygmy-Aka	143	0
LOBAYE(1987)	5 - 65	Ubanguian	285	1.7
SANGHA(1986)	15 - 65	Pygmy-Babinga	280	0
BIRAO(1985)	5 - 65	Chari-Nil	284	1.4
BAMBARI(1986)	5 - 65	Ubanguian	79	1.2
BAMBARI(1987)	5 - 65	Ubanguian	374	3.7
BANGASSOU(1985)	5 - 65	Ubanguian	120	2.5

Table 3: HIV-1 ANTIBODY PREVALENCE IN HOSPITALIZED PATIENTS (BANGUI,CAR)

PATIENTS	HOSPITAL ORIGIN	1986		1987	
		TOTAL	%	TOTAL	%
adult	Medical Ward	79	1.2	na*	
adult	Intensive Care Unit	192	17.2	212	26.2
child**	Pediatric Medical Ward	324	8.9	na	

\* Not Available

\*\*In collaboration with Drs M.R.Siopathis,Ch.Lanckriet & J.C.Bouquety

Table 4: SEROLOGICAL STUDY ON AIDS RISK GROUPS FROM THE  
CENTRAL AFRICAN REPUBLIC

DATE	ORIGIN	GROUP SAMPLED	POPULATION	TOTAL	% OF TESTED POSITIVE
1985	BANGUI	Tuberculosis Adult		100	6
1986	BANGUI	Tuberculosis Adult		66	6
1987	BANGUI	Tub.LF*	Adult	55	40
1985	BANGUI	Prostitute	Female	98	16.3
1986	BANGUI	Prostitute	Female	179	20.6
1987	BANGUI	Prostitute	Female	66	13.6
1986	BANGUI	Malnourished Child**		175	12.2
1986	BANGUI	***	Mother **	101	24.8
1986	BOSSANGO	Malnourished Child **		74	4.0
1986	BOSSANGO	***	Mother **	74	6.7

\* Tuberculosis Lymphnode Form

\*\*In collaboration with Dr Chassignol (Foyer de  
Charité) & Drs Coumanzi Malo and Birem Etchebes  
(Centre de Diététique expérimentale)

\*\*\* Mother of malnourished child