C. Desgranges, S. Fillon, F. Letourneur*, L. Buzelay†, C. Sepulveda‡, M-A. Guzman‡, A. Afani‡, F. Barin† and S. Saragosti*, Unité 271 INSERM, Virus des Hépatites, Rétrovirus Humains et Pathologies Associées, Lyon, *Institut Cochin de Génétique Moléculaire, Paris, †Laboratoire de Virologie, EP CNRS 117, CHRU Bretonneau, Tours, France, and ‡Hospital Clinico Universidad de Chile, Santiago, Chile.

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References

1. Cáceres CF, Hearst N: **HIV/AIDS in Latin America and the Caribbean: an update.** *AIDS* 1996, **10** (suppl A):S43–S49.
2. Arredondo A: **Estado actual del el pays. VIH/SIDA en Perfil del VIH/SIDA en Cifras, Chile, 1984–1994.** Edited by Silva JD. Santiago: Chomali M, Ferreccio C, Lastra P, Otaiza F; 1995: 7–35.
3. Myers G, Korber B, Hahn BH, *et al.*: *A Compilation and Analysis of Nucleic Acid and Amino Acid Sequences.* Los Alamos: Los Alamos National Laboratory; 1995.
4. Barin F, Lahbabi Y, Buzelay L, *et al.*: **Diversity of antibody binding to V3 peptides representing consensus sequences of HIV-1 genotypes A to E: an approach for HIV-1 serological subtyping.** *AIDS Res Hum Retroviruses* 1996, **12**:1279–1289.
5. Albert J, Fenyö EM: **Simple, sensitive, and specific detection of human immunodeficiency virus type 1 in clinical specimens by polymerase chain reaction with nested primers.** *J Clin Microbiol* 1990, **28**:1560–1564.
6. Thompson JD, Higgins DG, Gibson TJ: **CLUSTAL W: improving the sensitivity of progressive multiple sequence alignment through sequence weighting, position-specific gap penalties and weight matrix choice.** *Nucleic Acids Res* 1994, **22**:4673–4680.
7. Felsenstein J: **PHYLIP: phylogeny interference package.** *Cladistics* 1989, **5**:164–166.
8. Warren RQ, Wong MT, Melcher GP, *et al.*: **Serological evaluation of human immunodeficiency virus type 1-infected individuals from Argentina and the United States indicates a similar distribution of subgroup B isolates.** *J Clin Microbiol* 1995, **33**:481–483.
9. Fernandez Medina RD, Jansson M, Hapali E, Russi JC, Libonatti O, Wigzell H: **Genetic analysis of V3 domain sequences obtained from Uruguayan HIV type 1-infected individuals.** *AIDS Res Hum Retroviruses* 1996, **12**:1491–1493.
10. Cabello A, Cabral M, Vera ME, *et al.*: **Analysis of the V3 loop sequences from 10 HIV type 1-infected AIDS patients from Paraguay.** *AIDS Res Hum Retroviruses* 1995, **11**:1135–1137.
11. Potts KE, Kalish ML, Lott T, *et al.*: **Genetic heterogeneity of the V3 region of the HIV-1 envelope glycoprotein in Brazil.** *AIDS* 1993, **7**:1191–1197.
12. Da Costa SM, Schechter M, Shindo N, *et al.*: **Sequence and phylogenetic analysis of glycoprotein 120 of an HIV type 1 variant (GWGR) prevalent in Brazil.** *AIDS Res Hum Retroviruses* 1995, **11**:1143–1145.
13. Hatton T, Shiozaki K, Eda Y, *et al.*: **Characteristics of the principal neutralizing determinant HIV-1 prevalent in Japan.** *AIDS Res Hum Retroviruses* 1991, **7**:825–830.
14. Sabino EC, Diaz RS, Brigido LF, *et al.*: **Distribution of HIV-1 subtypes seen in an AIDS clinic in Sao Paulo City, Brazil.** *AIDS* 1996, **10**:1579–1584.

HIV-1 group O virus infection in Abidjan, Côte d'Ivoire

Côte d'Ivoire is the West African country that is most severely affected by the AIDS epidemic. In Abidjan, the economic capital, 15% of pregnant women and 45% of tuberculosis patients are HIV-infected [1,2]. Surveillance of HIV-1 subtypes among tuberculosis patients reveals that more than 90% of HIV-1 infections are due to subtype A; among persons with HIV-2 infection, HIV-2 subtypes A and B predominate [3].

The highly divergent HIV-1 group O virus, first identified in Cameroon in 1990 [4,5] is of public health interest because infections with this strain of viruses are not uniformly detected by some commercial serological assays [6,7]. To date, no formal surveillance for HIV-1 group O infections has been carried out in Abidjan. To elaborate and validate HIV serological algorithms in this population severely affected by the AIDS epidemic, we need a better understanding of the prevalence of this infection.

A total of 4451 serum or plasma samples obtained from various populations in Abidjan were selected for testing. All the samples had been tested previously by at least one whole virus lysate enzyme-linked immunosorbent assay (ELISA; HIV-1 and HIV-2, Genetic Systems, Seattle, Washington, USA; or Genelavia Mixt, Sanofi Diagnostics Pasteur, Marnes-la-Coquette, France). These assays have been shown to have high sensitivity for the detection of antibodies to HIV-1 group O viruses [6,8]. The serostatus for the samples that were ELISA-positive was defined either by Western blot testing (HIV-1 Western blot, Genelabs Diagnostic, Singapore; HIV-2 Western blot, Sanofi Diagnostics Pasteur) or Peptilav 1-2 (Sanofi Diagnostics Pasteur). Samples were collected between 1994 and 1997 from participants in epidemiological studies: 1396 female sex workers (1240 HIV-seropositive, 151 HIV-seronegative, five Western blot-indeterminate), 712 pregnant women (604 HIV-seropositive, eight HIV-seronegative, 100 indeterminate), 1011 HIV-positive hospitalized patients, 1011 tuberculosis patients (975 HIV-seropositive, 12 HIV-seronegative, 24 indeterminate), and 321 blood donors (31 HIV-seropositive, 290 HIV-seronegative). Of the 4451 samples, 3228 were serotyped as HIV-1, 24 as HIV-2, and 578 as HIV-1 and HIV-2 dually reactive; 31 other sera from blood donors were HIV-seropositive, but information was not available for HIV type; 129 sera were Western blot-indeterminate; and 461 sera were HIV-seronegative by standard testing.

To detect antibody to HIV-1 group O, we tested all sera by a research ELISA (Innogenetic, Ghent, Belgium) that incorporated a combination of V3-loop peptides from the ANT70 and MVP-5180 HIV-1 group O isolates [9,10]. Sera reactive by this ELISA were further tested by a group O-specific line immunoassay (LIA-O, Innogenetic), in which biotinylated V3 peptides from different group O and group M HIV-1 viruses were applied as a streptavidin complex in parallel lines on nylon strips. All samples that were either reactive (reactivity to group O V3-loop peptide) or indeterminate (reactivity both to group M and O V3-loop peptides) in LIA were further analysed using an HIV-1 reverse transcriptase (RT) PCR assay, by using primers sensitive and specific for group O viruses [10,11].

Of the 4451 samples, 37 (0.8%) were reactive by the group O-specific ELISA. When tested by LIA-O, 19 were indeterminate and 18 were negative. The 19 indeterminate samples were further tested by RT-PCR, but only one was positive. Thus, the overall prevalence of confirmed group O infection was one (0.02%) for all 4451 sera, or one (0.03%) out of all the 3861 HIV-seropositive sera. The confirmed HIV-1 group O sample was obtained in 1996 from a 22-year-old HIV-1-seropositive Ivorian woman hospitalized for meningitis. It is possible that some of the LIA-O-indeterminate samples were falsely negative by RT-PCR because of poor specimen storage conditions. However, it is more likely that these samples represent HIV group M infections. Peeters *et al.* [10] found that most samples that cross-reacted simultaneously with group O and M peptides in LIA-O were infected only with HIV-1 group M viruses.

Our finding of a very low (0.03%) prevalence of group O viruses in persons infected with HIV is in accordance with studies that have reported low prevalence of group O viruses in West African countries, including Senegal (0.07%), Togo (0.14%), Niger (0.3%), Mali (0%), and Burkina Faso (0%) [9,10]. These findings suggest that the current HIV serological algorithm used in Abidjan is suitable. However, periodic surveillance for divergent HIV strains is important because of the high prevalence of HIV and the great mobility of the local population.

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J. Nkengasong*, F. Sylla-Koko†, M. Peeters‡, D. Ellenberger§, M. Sassan-Morokro*, R-A. Ekpini*, P. Msellati¶, A.E. Greenberg*§, P. Combe† and M. Rayfield§, **Projet RETRO-CI, †CeDReS, Abidjan, Côte d'Ivoire, ‡ORSTOM, Laboratoire des Rétrovirus, Montpellier, France, §Centers for Disease Control and Prevention, Atlanta, Georgia, USA, and ¶Programme SIDA, ORSTOM, Abidjan, Côte d'Ivoire.*

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References

1. Sylla-Koko F, Anglaret X, Traoré-Anaky MF, *et al.*: **Séroprevalence de l'infection a VIH dans les consultations prénatales d'Abidjan, Côte d'Ivoire, 1995.** *Med Mal Infect* 1997, **27**:127–128.
2. Abouya L, Coulibaly IM, Wiktor SZ, *et al.*: **The Côte d'Ivoire national HIV counselling and testing program for tuberculosis patients: implementation and analysis of epidemiologic data.** *AIDS* 1998, **12**:505–512.
3. Ellenberger D, Luo C-C, Pieniazek D, *et al.*: **Analysis of genetic diversity of HIV in Côte d'Ivoire using restriction fragment length polymorphism (RFLP) analyses.** *XI International Conference on AIDS.* Vancouver, July 1996 [abstract TuA2065].
4. Vanden Haesevelde M, Decourt J, De Leys R, *et al.*: **Genomic cloning and complete sequence analysis of a highly divergent African human immunodeficiency virus isolate.** *J Virol* 1994, **68**:1586–1596.
5. Janssens W, Buvé A, Nkengasong JN: **The puzzle of HIV-1 subtypes in Africa.** *AIDS* 1997, **11**:705–712.
6. Schable C, Zekeng L, Chou-Pau P, *et al.*: **Sensitivity of United States HIV antibody tests for detection of HIV-1 group O infections.** *Lancet* 1994, **344**:1333–1334.
7. Hu DL, Dondero TJ, Rayfield M, *et al.*: **The emerging genetic diversity of HIV, the importance of global surveillance for diagnostics, research, and prevention.** *JAMA* 1996, **275**:210–216.
8. Simon F, Ly TD, Baillou-Beaufils A, *et al.*: **Sensitivity of screening kits for anti-HIV-1 subtype O antibodies [letter].** *AIDS* 1994, **8**:1628–1629.
9. Peeters M, Gueye A, Mboup S, *et al.*: **Geographical distribution of HIV-1 group O viruses in Africa.** *AIDS* 1997, **11**:493–498.
10. Peeters M, Gaye A, Mboup S, *et al.*: **Presence of HIV-1 group O infection in West Africa [letter].** *AIDS* 1996, **10**:343–344.
11. Janssens W, Fransen K, Loussert-Ajaka I, *et al.*: **Diagnosis of HIV-1 group O infection by polymerase chain reaction.** *Lancet* 1995, **346**:451–452.

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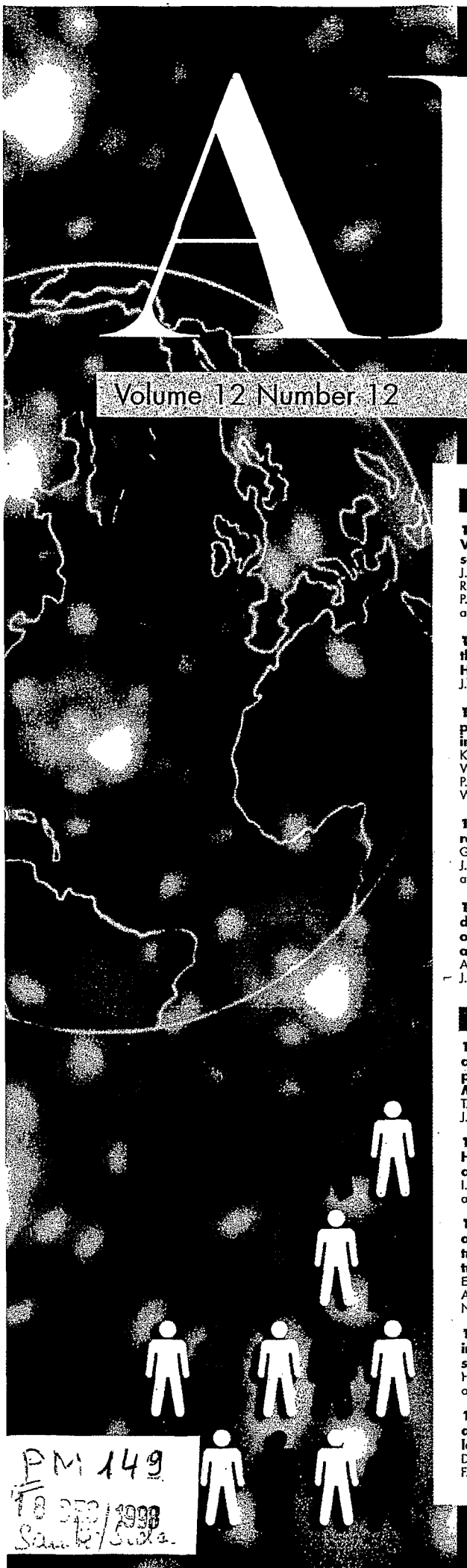

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