14. AIDS

In 1980 the name Acquired Immuno-deficiency Syndrome (AIDS) did not exist. Ten years later this same AIDS is a major public health problem in more than 140 countries, due to the rapid spread of the infection, to its extension and to its fatal outcome.

Without the clinical knowledge of American lung and skin specialists or without the efficiency of epidemiologists from the Centres for Disease Control (CDC) of Atlanta, AIDS could have stayed in the group of ill-defined diseases.

Since January 1981, pneumologists of Los Angeles have been puzzled by the occurrence of pneumonia due to Pneumocystis carinii, showing an immune-deficiency in five men whose only common feature was homosexuality. In New York and San Francisco some dermatologists had seen, from 1979 onwards, but particularly in the summer of 1981, a number of patients with Kaposi sarcoma, a disease that was previously very rare in USA. All were homosexual and in poor general status. All these data were collected at the CDC.

Pneumocystis carinii and Kaposi became indicators of the syndrome. It was a good choice, because the diagnosis was still based in the absence of a primary lesion on the choice of a number of major and minor signs, on the occurrence of opportunistic infections located at different places and/or on the observations of malignancies, all accompanied with the breaking down of immune defences.

At the present time the resurgence of tuberculosis among AIDS-patients has become a disturbing problem underlining that the breakdown of immune mechanisms due to AIDS could open the door to a public health problem that appeared to have been solved.

Studies on the aetiology of AIDS have orientated towards virology. This field became indicated for two reasons: first, the syndrome appeared in January 1982 in an A haemophilic patient who had received concentrates of blood coagulating factors under very strict rules of asepsis which only allowed the presence of a filtrating agent; secondly, it was demonstrated by Max Essex of the Harvard School of Public Health, that Feline Leukaemia Virus (FeLV) was causing immunodepression in cats. This fact directed towards the first retrovirus detected in man by Robert Gallo of NIH, the human T-cells leukaemia virus (HTLV 1), which is the agent of a rare leukaemia provoking unlimited multiplication of T-cells.

It was then quickly proved that 20 to 30 % of the AIDS-patients were carrying antibodies against surface antigens of cells transformed by the HTLV 1. This was as much not significant. Various retroviruses, not necessarily pathogenic, circulate widely and produce crossed sero-conversions. As HTLV 1 has spread in South-East Japan where AIDS is not occurring, HTLV 1 was shown as not being the agent looked for.

The hunt for another virus was open.

A team at the Pasteur Institute in Paris was studying the role of retroviruses in breast cancer. It is to the honour of this Institute that they detected such a virus in the lymphocytes obtained from the biopsy of a lymph node removed from a homosexual patient showing lymphadenopathy. The same virus was also detected in a high risk group infected with the preliminary signs of AIDS. This virus is characterized by a specific tropism for some lymphocytes and by its reverse transcriptase, an enzyme of ARN virus of the retrovirus group. In 1983 it was to be called LAV (Lymphadenopathy Associated Virus).

In 1984, American virologists isolated the same virus and called it HTLV III while starting off much controversial discussion and a regrettable competition in priorities. Finally the virus received the name of HIV, for which there exists at least one variant.

Clinical, epidemiological and biological studies have made possible to clarify that AIDS is a new disease, transmissible but not highly contagious, mainly by sexual intercourse but also by transfusion of blood or derivatives. The first cause of transmission is particular to high risk groups and individuals who have a high number of sexual partners. The second is observed among intravenous drug addicts and also recipients of poorly controlled or even uncontrolled transfusions.

Research must not be limited to establish a more comprehensive list of opportunistic infections but it must also improve the knowledge of the evolution of this viral disease among antibody carriers, as well as those at the stage of AIDS-related complex (ARC) or at the stage of Lymphadenopathy-Associated Syndrome (LAS). Such information is of the highest importance to allow a realistic prognosis and to help understand the course of other diseases with chronic clinical expressions.

(cont.)
Finally no other infection, how serious it might be, does invariably lead to death. However for this syndrome of cell-mediated immune deficiency it is urgent to get more precise knowledge on a number of specific points, because in the African environment several causes are found in combination. Therefore the particular aspects of paediatric AIDS are very important (see p. 1131), as is the role played by cofactors such as hepatitis B, treponematoses, genital herpes, simplex virus, etc. It will also be important to know what benefits can be expected from the existence of an infrastructure oriented towards primary health care and education in hygiene.

It can unfortunately be foreseen that the disease will still continue to spread for some time, before it can be expected to stabilize.
ACQUIRED IMMUNO-DEFICIENCY SYNDROME

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ACQUIRED IMMUNODEFICIENCY SYNDROME

1. Definition

The Acquired Immuno-Deficiency Syndrome (AIDS) is an often fatal disease characterized by opportunistic infections and tumours. It is caused by human immuno-deficiency virus (HIV), previously designated as Human-T-Lymphotrophic Virus, type III (HTLV-III; Gallo et al., 1984), or Lymphadenopathy Associated Virus (LAV; Barré-Sinoussi et al., 1983) or AIDS-Related Virus (ARV; Levy et al., 1984).

In 1986 another human retrovirus, HIV 2 was isolated from West-African patients (Clavel et al., 1986; Clavel 1987). This virus is endemic in West Africa, but was also observed occasionally in Central Africa (Colebunders et al. 1989).

The World Health Organization (WHO, 1986) adopted the case definition of AIDS developed by the Centres for Disease Control of Atlanta, USA (CDC). This definition is complex and is shown in table 1, p. 661. It requires extensive diagnostic procedures and laboratory investigations which are often not available in developing countries. A simplified clinical case definition was developed for use in such areas (WHO, 1985) and will be discussed under point 2 and in table 2, p. 663.

The first cases of AIDS were described in 1981 in homosexual men and intravenous drug-abusers in the United States (Centres for Disease Control, 1981 a-b; Gottlieb et al., 1981), and since then cases have been reported from most parts of the world (Brunet et al., 1983; Curran et al., 1985; Quinn et al., 1986, and 1987).

AIDS is only the most severe form of the clinical spectrum of infection with HIV. This spectrum of clinical expression is summarized in table 3 (p. 664), and varies from healthy carriership over chronic generalized lymphadenopathy to fatal opportunistic infections (Centres for Disease Control, 1986). A fundamental feature of AIDS is a deeply lowered T-cell type immunity, particularly a lack of T helper/inducer function (Lane et al., 1985).

2. Clinical manifestations

The clinical manifestations associated with HIV infection vary in different populations due to the relative frequency of other endemic opportunistic infections. This brief review will deal with the disease as occurring in Africa where gastro-intestinal and dermatological manifestations seem to be more common than in Europeans and Americans with AIDS.

2.1. Early stages (seroconversion)

Two to six weeks after infection with HIV, when serum antibodies to the virus appear, some patients develop a mononucleosis-like syndrome or an acute aseptic meningitis.

However this invasion period can also escape all notice. This acute syndrome can be very serious and lead to death when it occurs in children after a blood transfusion (Colebunders et al., 1991).

2.2. AIDS-related complex (ARC)

Patients with ARC present with similar signs and symptoms and immunologic defects as AIDS cases, but these manifestations are less severe. In contrast with AIDS patients, there are no opportunistic infections or malignancies.

Clinical manifestations of ARC include weight loss, malaise and lethargy, anorexia, abdominal discomfort, diarrhoea, fever, night sweating, headache, itching, lymphadenopathy and splenomegaly, and amenorrhoea for women. These signs and symptoms are often intermittent and can disappear spontaneously during variable periods.

A generalized papular pruritic eruption (prurigo) is found in approximately 20 % of African patients with HIV-infection and is often seen in the early stages of the disease (Colebunders et al., 1986; Mazebo et al., 1985). The aetiology of this eruption is unknown. Ten percent of patients with HIV-infection experience a herpes zoster infection, which tends to be recurrent (Colebunders et al., 1988). Oral candidiasis in an adult who has neither taken antibiotics, corticosteroids nor had an immuno-suppressive illness, is almost always associated with HIV-infection and is a bad prognostic sign for the progression towards AIDS.

Neurological and even psychiatric symptoms are frequent and are sometimes the only ones at the beginning of the disease. HIV encephalopathy is detectable by early and developing dementia (Perriëns et al., 1989).

2.3. Lymphadenopathy-Associated Syndrome

Lymphadenopathy-Associated Syndrome (LAS) is defined as lymphadenopathy of at least three months duration involving two or more extra-inguinal sites, in the presence of HIV-infection. During the evolution of the disease, lymphadenopathy may regress in size and even disappear when opportunistic infections occur. Lymph nodes larger than 6 cm in diameter in HIV-infected African patients are most likely to be of tuberculous origin.
2.4. AIDS

The same manifestations as described for ARC also occur in cases with AIDS, but they become more pronounced. The predominant presentation of AIDS in adults in Africa is a diarrhoea-wasting syndrome (Colebunders et al., 1986; Katlama et al., 1984; Odio et al., 1985; Piot et al., 1984; Piot et al., 1992; Quinn et al., 1986; Servaada et al., 1985; Van de Perre et al., 1984). Diarrhoea of over one month duration is found in 40% of patients. Patients may lose several litres of liquid a day sometimes leading to severe dehydration. In most patients an established cause of diarrhoea cannot be identified. In Kinshasa, Cryptosporidium was detected in 14% of patients with such a diarrhoea.

Opportunistic infections found in patients with AIDS are listed in Table 1 p. 661. In African patients the major opportunistic infections which have been identified include oesophagitis due to Candida albicans, cryptococcosis, generalized infection with Mycobacterium avium-intracellulare, tuberculosis, cytomegalovirus infection, severe herpes simplex infection, and recurrent Salmonella sp. septicaemia (Tables 1 and 4, pp. 661 and 664).

As infection by Mycobacterium tuberculosis has a high prevalence in tropical areas, one should not wonder that tuberculosis is one of the most important opportunistic infections in Africa. The AIDS epidemic seems to go along with an important increase in the number of cases of tuberculosis, thus impairing the control of this disease in Africa (WHO, 1988; Standaert et al., 1989). At Kinshasa and at Bujumbura 15 to 20% of the tuberculosis out-patients and 30 to 40% of hospitalized TB patients are also infected HIV (Willame et al., 1988; Colebunders et al., 1989; Standaert et al., 1989). Although in the beginning the seropositive TB patients were reacting as well as the seronegative patients to the treatment by tuberculostatic drugs, the number of relapses and the mortality are much higher among seropositive cases (Perriëns et al., 1989). It is still not known if they could be more contagious for those living close to them than seronegative tuberculous patients (Standaert et al., 1989).

Kaposi’s sarcoma, an angio-proliferative disorder of probably endothelial origin, is found in 4 to 15% of African patients with AIDS, as compared to nearly half of American homosexual AIDS patients. This is in contrast to the endemic form of Kaposi’s sarcoma in Central Africa, which is not associated with HIV infection or immuno-suppression (Bayley et al., 1985; Biggar et al., 1984; Gigase et al., 1986; Kestens et al., 1985), AIDS-associated Kaposi presents as a generalized aggressive disease, with involvement of the skin, lymph nodes and various organs, particularly the pulmonary and gastrointestinal systems.

AIDS brings numerous laboratory abnormalities. High erythrocyte sedimentation rate, neutropenia and lymphopenia are nearly always found, as well as cutaneous anergy, a decreased number of T-helper cells and evidence of polyclonal B cell stimulation. Virtually all immunological parameters are abnormal.

These clinical symptoms develop among persons infected by HIV-1 as well as by HIV-2. But in the latter cases the evolution seems slower.

2.5. HIV-1 infection in childhood

Infection with HIV has a serious impact on the morbidity and mortality of newborn infants and children.

Studies in Zaire and in Kenya have demonstrated that the number of stillbirths and prematurity is higher for seropositive mothers (Ryder et al., 1989; Temmerman et al., 1989). In three large prospectors studies from the Congo, Rwanda and Zaire children born to HIV-1 seropositive mothers, infant mortality was five to ten times higher than for controlled children born to seronegative mothers (Lallemand et al., 1989; Ryder et al., 1991; Lepage et al. 1991). In addition, there is a neurodevelopmental delay in children infected with HIV (Badibanga et al., 1989; Nsa et al., 1989; Mselati et al., 1991).

Among children with AIDS, the same opportunistic infections are noticed as those among adults. However bacterial infections and lymphoid interstitial pneumonia are much more frequent in children (Jonckheer et al., 1987; Lepage and Hitimana, 1991). Some HIV-infected children will only develop the disease at seven or ten years of age (Lepage et al., 1991).

The diagnosis of HIV in children below one year is a difficult problem because detected HIV antibodies can be of maternal origin (see also Paediatrics p. 1132).

3. Diagnosis

The diagnosis of AIDS is based on clinical signs and on the identification of an opportunistic infection or a malignancy as listed in Table 1. Whenever possible, the presence of a serum antibody to HIV should be demonstrated by a well tried serologic test such as an enzyme immuno-assay, to be confirmed by an accepted test such as the immuno-blot assay.

However, in many developing countries, diagnostic and laboratory facilities may be insufficient to reliably

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recognize opportunistic infections and malignancies associated with AIDS. Therefore a provisional list of clinical signs calling for AIDS was developed by WHO (Table 2, p. 663). The specificity of this definition for the diagnosis of HIV infection in one hospital in Kinshasa was 94 %, the sensitivity 62 % and the predictive value 54 % compared to a specific laboratory test (Colebunders et al., 1987). Tuberculosis represents one of the major problems for the differential diagnosis. Cutaneousnergy to tuberculin, even in the presence of proved tuberculosis was significantly associated with AIDS in Kinshasa, where 33 % of 159 patients with tuberculosis had HIV antibodies (Mann et al., 1986b). Thus, HIV infections may increasingly complicate tuberculosis control programmes.

4. Human Immuno-deficiency Virus (HIV)

HIV is a retrovirus belonging to the Lentiviridae, as based on morphology, nucleic acid composition, characteristics of its structural proteins and reverse transcriptase production.

Different isolations of HIV exhibit genomic diversity, particularly in the gene env region which encodes for the major external glycoprotein of the virus. Viruses isolated from African patients are undoubtly the same virus, but as a group they are more heterogeneous than isolates from Europe and North America (Henn et al., 1985).

Important biologic properties of HIV include the presence of a reverse transcriptase, an enzyme essential for making a DNA copy of this RNA virus, the integration of viral DNA into the genome of the host cell, and the preferential infection of T-lymphocytes with the helper phenotype (OKT4/Leu 3a+). HIV infection may result in host cell destruction, but the virus may also remain latent in lymphocytes or macrophages and replicate without causing cell damage or a clinical disease. Once an individual is infected with this virus, he probably remains infected for life. The brain appears to be infected in a large number of patients.

HIV has been isolated from blood (from lymphocytes and macrophages as well as from plasma), from semen, cervicovaginal secretions, bone marrow, saliva, brain tissue, cerebrospinal fluid, tears, amniotic fluid, urine, and from breast milk. Virus isolation is technically difficult and costly, and is not a routine procedure.

5. Pathogenesis

Clinical signs of AIDS and ARC are primarily due to the critical injury of the immune system by selective infection of T-helper lymphocytes. As a result of this immunologic dysfunction, the host becomes susceptible to life threatening opportunistic infections and malignancies. IgG, and probably IgM serum antibodies specific to HIV antigens can be found five to 16 weeks after infection. Antibodies detected by currently available serologic assays are not neutralizing. However, low concentrations of specific neutralizing antibodies were demonstrated by some research workers. The virus can be isolated from the blood of the majority of seropositive individuals. This means that for practical purposes seropositive persons should be considered as a source of infection.

Among HIV infected individuals in Zaire, progression towards AIDS occurred at a rate of 3 to 5 % per year. Also 10 % of the cases of AIDS-related complex with generalized lymphadenopathy developed the disease (Mann et al., 1986; N’galy et al., 1988).

6. Epidemiology

By August 1989 more than 175,000 cases of AIDS had been officially reported to WHO, among which 31,146 were from Africa.

AIDS was first recognized in 1981 in the United States. Shortly after the identification in Belgium and France of cases among Africans (Brunet et al., 1983; Clumeck et al., 1983; Clumeck et al., 1984; Katlama et al., 1984; Sonnet et al., 1983; Taelman et al., 1983) the study of HIV infection was started in Africa. It is difficult, if not impossible, to define when HIV infection appeared in Africa. Whereas reporting of an isolated case and the results of some retrospective serum surveys suggest that HIV may have existed earlier in Africa (Biggar, 1986; Bygbjerg, 1983; Vandepitte et al., 1983), it is clear from the study of hospital records in Africa and Europe, and from the notification of some sentinel markers for AIDS such as cryptococcosis, that the current epidemic of AIDS began during the late 1970’s and early 1980’s (Bayley, 1984; Lamé et al., 1982; Quinn et al., 1986).

6.1. Incidence of AIDS

AIDS has now become a public health problem in all countries of Central and East Africa, occurring mainly, but not exclusively in the major cities. Its annual incidence in the large urban centres such as Kigali and Kinshasa is estimated at 200 to 1,000 cases per million population (Mann et al., 1986; Piot et al., 1984; Van de Perre et al., 1985). In Kinshasa in 1984, the minimal age-specific incidence rates of reported
cases were 786 per million and 601 per million among 30 to 39 year old men and women, respectively. The sex ratio approached 1:1, but men with AIDS were older than women (37 years versus 30 years).

6.2. Prevalence and incidence of AIDS

It is seldom that the prevalence of HIV infection for a population is known, because there are so many logistical, financial and ethical problems involved.

Rwanda was still in 1989 the only country in the world to publish the results of a national survey on a representative population sample. (Rwandan HIV Seroprevalence Study Group, 1989). This study showed that in urban areas of Rwanda, about 30 % of the adults aged from 20 to 40 years were infected by HIV, while only 2 % of the same age group were infected in rural areas. A similar survey in Uganda during 1988 showed comparable infection rates in cities but higher figures for some rural population groups (Berkley et al., 1989).

In Kinshasa the seroprevalence among pregnant women rose from 0.25 % in 1970 to 7 % in 1986 (Brun-Vézinet et al., 1985; Piot et al. 1988), illustrating the spread of HIV-infection in the general population. A somewhat lower prevalence rate was also mentioned among employees of two large companies at Kinshasa (Ryder et al., 1989). However, unlike the observations carried out in other Central African countries, this rate of seroprevalence did not seem to increase in Kinshasa (N’galy et al., 1989).

Although data for Zaire are only partly available, the infection rate seems lower in rural areas. For the Bumba and Lisala areas (Equator), HIV seroprevalence was 0.8 % in 1986 for the overall population (Nzila et al., 1988). This rate was at the same level as the seroprevalence seen on samples collected in the same area for the epidemic of haemorrhagic fever at Ebola in 1976.

The age-specific seroprevalence rates show a bimodal distribution with peaks under one year of age and between 15 and 30 years (Quinn et al., 1986). This pattern suggests a sexually transmitted disease which can also be transmitted from mother to infant.

6.3. Transmission

HIV is transmitted by sexual contact (heterosexual or homosexual), by administration of infected blood or blood products, by contaminated injections, and transmission from infected mothers to their infants (Curran et al., 1985).

In contrast to North America and Europe where the great majority of AIDS cases acquired the disease by homosexual contact or by intravenous infection among drug addicts, bidirectional heterosexual transmission is the major mode of infection in Africa (Biggar, 1986; Clumeck et al., 1986; Piot et al., 1984; Quinn et al., 1986; Serwadda et al., 1985; Van de Perre et al., 1984). In case control studies, AIDS cases had a higher number of heterosexual partners than controls, had more often a contact with female prostitutes, and the risk of seropositivity increased with the number of different sex partners or with a previous history of sexually transmitted diseases. Prostitutes are probably playing an important role in the spread of HIV infection in Africa (Kreiss et al., 1986; Mann et al., 1987; Piot et al., 1988; Van de Perre et al., 1985).

Risk factors associated with HIV infection in heterosexuals are similar to those for sexually transmitted diseases.

Particular sexual practices such as anal intercourse were not specifically associated with HIV infection. However, disruption of genital epithelial integrity seems to be a risk factor for HIV infection (Kreiss et al., 1986; Mann et al., 1988; Taalman et al., 1983; Piot and Laga, 1989; Simonsen et al., 1988; Johnson and Laga, 1988). Prospective studies at Kinshasa and at Nairobi have shown that genital ulcers due to chancroid and that other STDs as trichomonas and Chlamydia trachomatis infection, are important risk factors for the sexual transmission of HIV infection (Plummer et al., 1989; Laga et al., 1989). A high frequency of STDs among some urban population groups of Africa, could explain the large-scale heterosexual transmission of the HIV infection, in contrast to the European situation today.

The risk of infection by blood transfusion is much higher in Central Africa than in Europe: 9 to 31 % of AIDS patients have a history of bloodtransfusion (Van de Perre et al., 1985). Patients with Sickle cell anaemia are probably a high risk group for AIDS because of multiple transfusions (Izzia et al., 1984). The role of medical injections in the HIV epidemic has not yet been established (Mann et al., 1986 a; Mann et al., 1986 h; Mann et al., 1986 g.; Lepage et al., 1986; N’galy et al., 1988).

Finally another risk factor for sexual transmission of HIV is the clinical stage and the degree of immuno-deficiency of the infected patient. Indeed the infective potential seems to increase with the development of the virus within the carrier person (Laga et al. 1989).

As a result of HIV infection in women, perinatal transmission is obviously increasing in Africa. The
rate of mother to child transmission of HIV-1 is estimated to reach up to 65% of the cases, but the pathogenesis and natural history of perinatal infection are still poorly understood. In a large cohort study at Kinshasa, the mortality of children born to HIV-1 seropositive mothers was as high as 30% before two years of age. As for sexual transmission, it is the mothers with a more advanced immuno-deficiency who more easily transmit the virus to their foetus (Ryder et al., 1989; Nsa et al., 1989; Lepage et al., 1993). See also Paediatrics, p. 1132.

The transmission of HIV by breast-feeding is discussed in the chapter Paediatrics pp. 1132 to 1136.

As in Europe and the U.S., in Africa there is no evidence for HIV transmission by casual non-sexual contact with the infected, nor by arthropods, nor within household and occupational settings such as a hospital (Mann et al., 1986 c; Mann et al., 1986 d; Piot et al., 1986).

7. Prevention and control

As neither an effective treatment nor a vaccine for HIV infection or AIDS is available, and control is necessarily based on prevention of virus transmission. Preventive measures include:
- screening of blood donors for HIV antibodies;
- rejection of positive blood units;
- proper use of needles and syringes and reduction of the number of unnecessary medical injections;
- especially a change in sexual behaviour, implying a reduction in the number of sexual partners and the use of condoms.

Because of fundamental social, psychological and financial implications, solutions are not easy to apply, and any AIDS control programme will be difficult to implement. However, if no successful control efforts are initiated, HIV infection will continue to spread rapidly, exacting its toll on the health of the population in Africa and possibly disrupting health services. In addition the demographic and socio-economic consequences could be serious, because the most productive age groups are also the most affected (Anderson et al., 1988; Over and Piot, 1991).

Since many years, special AIDS control programmes have begun in almost all countries of the world. Under the impulse of WHO and with international support, these national programmes have started their long and difficult task of primary prevention by a change in sexual behaviour. Integration of this programme within primary health care appears particularly difficult. An easier way to reach success is to ensure safe blood transfusions by detecting HIV positive donors and by organizing proper blood banks.

P. Piot

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TABLE 1

WHO/CDC definition of AIDS (revision 1987)

For the purposes of epidemiologic surveillance, WHO defines a case of Acquired Immuno-deficiency Syndrome (AIDS) as an illness characterized by one or more opportunistic diseases in the list established according to the patient's serological condition for AIDS.

I. When the serological condition of the patient cannot be determined for one of the following reasons:

- it is impossible to apply the serological tests;
- results of the tests are unclear or conflicting;
- immuno-deficiency of the patient is due to:

1) large amount or long-lasting corticotherapy, immuno-depressive or cytotoxic treatment applied within three months before the test.
2) Hodgkin's disease or non-Hodgkin's lymphoma (other than cerebral), lymphocytic leukaemia, multiple myeloma, any other cancer of lymphoreticular or histiocytic tissue, or angio-immunoblastic lymphadenopathy recognized within the three months according to the actual disease.
3) congenital or acquired immuno-deficiency not suggestive of HIV infection, and hypo-gammaglobulinaemia.
MAJOR HEALTH PROBLEMS

In such cases and in so far as the diagnosis is confirmed by a reference method, the following conditions permit the diagnosis of AIDS:

1. Candidiasis of oesophagus, trachea, bronchi or lungs.
2. Extrapulmonary cryptococcus infection.
3. Cryptosporidiosis with diarrhoea for more than one month.
4. Cytomegalovirus infection involving an organ other than the liver, spleen, lymph nodes in a patient more than one month old.
5. Mucocutaneous Herpes simplex virus infection lasting more than one month, or Herpes infection of bronchi, lungs or oesophagus for whatever length of time, in an individual more than one month old.
6. Kaposi’s sarcoma in a person less than 60 years of age.
7. Primary cerebral lymphoma for a person less than 60 years of age.
8. Lymphoid interstitial pneumonia or lymphoid lung hyperplasia in a patient less than 13 years of age.
9. Mycobacterium kansasii infection or M. avium disseminated infection (in an organ other than lungs, skin, cervical or lung hilar lymph nodes).
11. Progressive multifocal leuco-encephalopathy induced by Papova virus infection.
12. Cerebral toxoplasmosis in a patient of more than one month old.

II. When the serological condition is positive for HIV:

A. The diagnosis of AIDS can be made when one of the diseases occur mentioned above and here in A and B

1. Several or recurrent bacterial infections (at least two over a period of 2 years) due to Haemophilus, streptococci or other pyogenic germs, presenting as septicaemia, meningitis, lung, bone or joint infection, or occurring as an abscess of an organ or a natural cavity (except otitis media or superficial abscess of skin or mucous membrane) in a person more than 13 years old.
2. Disseminated coccidioidomycosis other than in lungs and cervical or mediastinal lymph nodes.
3. HIV encephalopathy (dementia).
4. Disseminated Histoplasmosis other than in lungs, cervical or mediastinal lymph nodes.
5. Isosporidiosis with diarrhoea lasting more than one month.
6. Kaposi’s sarcoma at all ages.
7. Primary cerebral lymphoma, at all ages.
8. Non-Hodgkin B-Cell lymphoma and lymphoma of unknown immunological phenotype or of the following histological types:
   - immunoblastic lymphoma (equal to large-cell lymphoma, to undifferentiated diffuse non-hodgkin lymphoma, to histiocyte lymphoma or to high malignant lymphoma);
   - non-divided small-cell lymphomas (Burkitt or Burkitt-like lymphoma)
9. All disseminated mycobacterial infections other than M. tuberculosis, involving any other organ than lungs, skin, mediastinal or cervical lymph nodes.
10. Repeated septicaemia due to Salmonella non typhi.
11. Mycobacterium tuberculosis miliary infection or involving an organ other than the lungs.
12. Cachexia due to HIV virus.

Remark
Are not indicative of AIDS: T-Cell lymphoma, lymphocytic-lymphoblastic- lymphoplasmocytic lymphomas, or divided small-cell lymphomas, Hodgkin’s disease, and those tumours of which the histological type was not mentioned above.

B. Diagnosis of AIDS can be supposed when there is proven

1. Candida oesophagitis.
2. Cytomegalovirus retinitis with blindness.
3. Lymphoid interstitial pneumonia and/or lymphoid hyperplasia of the lung in a child less than 13 years old.
4. Mycobacterial infection (acid-alcohol-fast bacillus not identified by culture), miliary or disseminated, invading sites other than lung, skin, cervical or mediastinal lymph nodes.

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5. *Pneumocystis carinii* pneumonia.
6. Brain toxoplasmosis in an individual more than one month old.
7. *Kaposi's sarcoma*.

Given the severity of diseases indicating AIDS, it is very important that the diagnosis should be correct (see table 2), particularly when recommended treatments have serious side effects or when precise diagnosis is necessary before applying an antiviral treatment. However, in some cases such confirmation is not possible. In such cases clinical or biological criteria (see table 3) allow a provisional diagnosis.

III. When the serological test is negative:

the patient is included among AIDS cases:
- if he has none of the causes of immuno-deficiency listed in I
- and has at the same time a proven *Pneumocystis carinii* pneumonia or one of the pathologies cited in I, with T4 lymphocytes < 400 per mm$^3$.

### TABLE 2

**Provisional WHO clinical case definition list for AIDS-cases when diagnostic resources are limited**

<table>
<thead>
<tr>
<th>Adults</th>
<th>Children</th>
</tr>
</thead>
<tbody>
<tr>
<td>The presence of generalized <em>Kaposi's sarcoma</em> or cryptococcal meningitis are sufficient by themselves for the diagnosis of AIDS.</td>
<td>Paediatric AIDS is suspected in an infant or child showing at least two major signs associated with no less than two minor signs in the absence of any known cause of immuno-suppression.</td>
</tr>
<tr>
<td>AIDS in an adult is defined by the existence of at least two of the major signs, associated with at least one minor sign, in the absence of known causes of immuno-suppression such as cancer or severe malnutrition or other recognized aetiologies.</td>
<td></td>
</tr>
<tr>
<td>1. Major signs</td>
<td>1. Major signs</td>
</tr>
<tr>
<td>a) weight loss of more than 10 % of body weight;</td>
<td>a) weight loss or an abnormally slow growth;</td>
</tr>
<tr>
<td>b) chronic diarrhoea for more than one month;</td>
<td>b) chronic diarrhoea for more than one month;</td>
</tr>
<tr>
<td>c) prolonged fever for more than one month (intermittent or constant).</td>
<td>c) prolonged fever for more than one month.</td>
</tr>
<tr>
<td>2. Minor signs</td>
<td>2. Minor signs</td>
</tr>
<tr>
<td>a) persistent cough for more than one month;</td>
<td>a) generalized lymphadenopathy;</td>
</tr>
<tr>
<td>b) generalized pruritic dermatitis;</td>
<td>b) oro-pharyngeal candidiasis;</td>
</tr>
<tr>
<td>c) recurrent <em>herpes zoster</em>;</td>
<td>c) repeated common infections (otitis, pharyngitis, etc);</td>
</tr>
<tr>
<td>d) oro-pharyngeal candidiasis;</td>
<td>d) persistent cough;</td>
</tr>
<tr>
<td>e) chronic progressive and disseminated <em>herpes simplex</em> infection</td>
<td>e) generalized dermatitis;</td>
</tr>
<tr>
<td>f) generalized lymphadenopathy</td>
<td>f) confirmed maternal HIV infection</td>
</tr>
</tbody>
</table>

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### TABLE 3

**CDC Classification System for HIV III** (Centres for Disease Control, 1986)

<table>
<thead>
<tr>
<th>Group</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>Acute Infection</td>
</tr>
<tr>
<td>II</td>
<td>Asymptomatic Infection (*)</td>
</tr>
<tr>
<td>III</td>
<td>Persistent Generalized Lymphadenopathy (*)</td>
</tr>
<tr>
<td>IV</td>
<td>Other Diseases</td>
</tr>
<tr>
<td></td>
<td>Subgroup A. Constitutional Diseases</td>
</tr>
<tr>
<td></td>
<td>Subgroup B. Neurologic Diseases</td>
</tr>
<tr>
<td></td>
<td>Subgroup C. Secondary Infectious Diseases</td>
</tr>
<tr>
<td></td>
<td>Category C1. Specified secondary infectious diseases listed in the CDC surveillance definition for AIDS</td>
</tr>
<tr>
<td></td>
<td>Category C2. Other specified secondary infectious diseases</td>
</tr>
<tr>
<td></td>
<td>Subgroup D. Secondary Cancers (**)</td>
</tr>
<tr>
<td></td>
<td>Subgroup E. Other Clinical Conditions</td>
</tr>
</tbody>
</table>

(*) Patients in Groups II and III may all be classified according to laboratory analyses
(**) Include those patients whose clinical presentation corresponds to the definition of AIDS used by CDC for national statistics (see table 1)

### TABLE 4

**Presumed diagnosis based on pathological indicators of AIDS**

( Opportunistic infections and malignancies )

<table>
<thead>
<tr>
<th>Diagnosed diseases</th>
<th>Main signs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Candidiasis of oesophagus</td>
<td>a. Recent retrosternal pain by swallowing oral candidiasis recognized by white plates on an erythematous base, or by mycelia seen directly under microscope on a mucosa scraping. and b.</td>
</tr>
<tr>
<td>Cytomegalovirus Retinitis</td>
<td>Typical signs on consecutive eye fundus examination: small sharp edged white spots on the retina extending from centre to periphery along the blood vessels; lesions developing since several months show often retinal vascularitis with haemorrhages and necrosis leaving atrophic pigmented scars.</td>
</tr>
<tr>
<td>Mycobacterial Disease</td>
<td>Acid and alcohol-fast bacilli not identified in culture, observed by microscope examination of stools, fluids, or tissues other than lungs, skin, cervical or mediastinal lymph nodes.</td>
</tr>
<tr>
<td>Kaposi’s Sarcoma</td>
<td>Typical red or purplish plaque on the skin detectable by the naked eye (recognized only by those who have seen several cases)</td>
</tr>
<tr>
<td>Lymphoid Interstitial Pneumonia</td>
<td>On lungs at both sides, X-ray, reticulo-nodular infiltrations to be seen since more than two months without any identifiable germ or any response to antibiotic drugs.</td>
</tr>
</tbody>
</table>
AIDS

_Pneumocystis carinii_ Pneumonia

a. Difficulty in breathing during an effort or a recent (less than 3 months) non-productive cough
and b. On X-ray diffuse bilateral interstitial infiltration of the lung or bilateral diffuse miliary extension by gallium scintigraphy
and c. Arterial oxygen pressure below 70 mm mercury or reduced transfer capacity (DLCO below 80% of theoretical value) or increased alveolo-capillar gradient of oxygen pressure.
and d. no bacterial lung infection

Toxoplasmosis of the Brain

a. Recent circumscribed signs of intracerebral lesion or altered mental status
and b. evocative rings with bright central part by computed tomography of the brain
and c. positive sero-test for toxoplasmosis or response to its specific treatment.

$DL_{CO}$ = Diffusing capacity of the Lung for carbon monoxide

---

**TABLE 5**

Percentages of opportunistic infections and malignancies in African patients with AIDS
(Colebunders et al., 1986)

<table>
<thead>
<tr>
<th>Condition</th>
<th>Kinshasa</th>
<th>Europe</th>
<th>USA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Candida Oesophagitis</td>
<td>27</td>
<td>21</td>
<td>10</td>
</tr>
<tr>
<td>Pneumocystis carinii Pneumonia (*)</td>
<td>17</td>
<td>24</td>
<td>61</td>
</tr>
<tr>
<td>Diarrhoea for more than a month</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>with Cryptosporidium</td>
<td>6</td>
<td>7</td>
<td>3</td>
</tr>
<tr>
<td>with Isospora belli</td>
<td>1</td>
<td>5</td>
<td>NA</td>
</tr>
<tr>
<td>Cryptococcosis</td>
<td>5</td>
<td>29</td>
<td>6</td>
</tr>
<tr>
<td>Herpetic ulcerations (since more than a month)</td>
<td>3</td>
<td>33</td>
<td>4</td>
</tr>
<tr>
<td>Cerebral Toxoplasmosis</td>
<td>NA</td>
<td>17</td>
<td>3</td>
</tr>
<tr>
<td>Infection with Atypical Mycobacteria</td>
<td>NA</td>
<td>10</td>
<td>4</td>
</tr>
<tr>
<td>Generalized Infection with Cytomegalovirus</td>
<td>NA</td>
<td>20</td>
<td>5</td>
</tr>
<tr>
<td>Progressive Multifocal Leuko-Encephalitis</td>
<td>NA</td>
<td>2</td>
<td>26</td>
</tr>
<tr>
<td>Kaposi’s Sarcoma</td>
<td>4</td>
<td>26</td>
<td>26</td>
</tr>
<tr>
<td>Cerebral Lymphoma</td>
<td>NA</td>
<td>0</td>
<td>0.5</td>
</tr>
<tr>
<td>Tuberculosis</td>
<td>13</td>
<td>12</td>
<td>NA</td>
</tr>
</tbody>
</table>

(*) Including, at Kinshasa, bilateral pneumopathy of unknown aetiology
NA: not available

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ANONYMOUS (1990), Parasitic and other infections in AIDS; Proceedings of a meeting organized jointly by the Royal Society of Tropical Medicine and Hygiene and the British Society for Parasitology, – Trans. R. Soc. Trop. Med. Hyg., 84(Suppl.1), 39 p.


CLUMECK N., ROBERT-GUROFF M., VANDERPERRE P., JENNINGS A., SIBOMANA J., DEMOL P., CRAN


HASSIG S.E., PERRIENS J., BAENDE E. et al. (1990), An analysis of the economic impact of HIV infection among patients at Mama Yemo Hospital, Kinshasa, Zaire, – AIDS, 4, pp. 883-887.


LEPAGE P., VAN DE PERRE P., VAN VLIET G., NSEGUMUREMYI F., VAN GOETHEM C., KESTELYN P.,


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VAN DE PERRE P., ROUROY D., LÉPAGE P., BOGAERTS J., KESTELYN P., KAYIHIGI J.,


