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AIDS in The Netherlands

CLINICAL AND MICROBIOLOGICAL DATA ON 36 CASES

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Summary

On 31st December 1984, 36 patients with AIDS fulfilling the CDC case finding criteria, had been treated in two academic hospitals. All of them had antibodies to LAV/HTLV-III. A description is presented of the clinical features, laboratory data and the many microbiological complications. The prognosis in patients with opportunistic infections was extremely poor; that in patients with only Kaposi's sarcoma was considerably better. *Neth J Med* 1985;28:487.

Introduction

In the spring of 1981 an unusual clustering of Kaposi's sarcoma and Pneumocystis carinii pneumonia was recognized in previously healthy homosexual men in New York City and California^{1,2}. Soon the clinical spectrum broadened, with many different so-called opportunistic infections, and in these patients evidence of a defect in cellular immune responses was found³⁻⁸. It was not until February 1983, over 5 years after onset of disease in the first recognized cases, that 1,000 patients with AIDS were reported to CDC⁹, but thereafter there was a near doubling of cases every 6 months^{10,11}.

The highest proportion of cases (73 per cent) was seen in homosexual or bisexual men, but soon other risk groups were identified: intravenous drug users (17 per cent of cases)¹², Haitian immigrants to the USA (3 per cent)¹³, haemophiliacs (1 per cent)¹⁴, receivers of blood transfusions (1 per cent)¹⁵, sexual partners of patients or persons at risk (1 per cent)^{11,16,17}. AIDS was also recognized in children from parents at risk (64 cases up to December 1984)^{11,18-22}. For the 26 per cent of all cases with a risk factor that does not apply to women (i.e. homosexual males or patients with haemophilia), 76 per cent have been males and 24 per cent females (US figures)²³.

Six months after the first American reports^{1,2}, the first report on European AIDS cases appeared²⁴, and today AIDS is recognized in countries all over the world²⁵. A large number of cases appear in Central Africa (especially Zaire; with 40 per cent female patients)^{25,26}, and in Haiti^{23,25,27,28}. Although it is possible that AIDS has been present unrecognized for a long time in Central Africa, the recent epidemic form is new there, too^{26,29}.

The epidemiology of AIDS soon suggested an infectious – i.e. viral – aetiology. Extensive evidence has now been accumulated that infection with a newly discovered retrovirus called lymphadenopathy-associated virus (LAV) or human T-cell lymphotropic virus III (HTLV-III), plays a crucial role in the pathogenesis of AIDS and related disorders³⁰⁻⁵⁵. The LAV/HTLV-III virus shows tropism for the OKT4⁺ subset of T-cells and, through a destructive action on these cells, brings about the permanent immune deficiency resulting in opportunistic infections and probably certain cancers^{38,48,56,57}. Antibodies to HTLV-III-related antigens can be found in up to 100 per cent of patients with AIDS^{35-37,41,42,51,58}. Besides AIDS the clinical spectrum of HTLV-III infection also encompasses symptom-free individuals, flu-like illness, persistent generalized lymphadenopathy, so-called AIDS-related complex, and autoimmune disease^{33,35-37,39-44,47-55,58}.

Total case fatality rate for AIDS patients in the USA so far is 47 per cent¹¹ but, since most cases have been diagnosed in the past 2 years, this is certainly an underestimation of final mortality. Of patients reported more than 3 years ago, 81 per cent have died²³.

In The Netherlands the first cases were diagnosed in 1982⁵⁹⁻⁶⁴. At the end of 1984, 42 cases meeting CDC criteria⁶⁵ had been reported⁶⁶. In this paper we describe the clinical, immunological and microbiological data on 36 of these patients.

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Methods

AIDS was diagnosed in accordance with the CDC surveillance definition, which demands two criteria: 1) the presence of a reliably diagnosed disease at least moderately predictive of cellular immunodeficiency; and 2) the absence of an underlying cause of the immune deficiency or of any defined cause of reduced resistance to the disease⁶⁵.

Included in our study are all patients admitted before 31st December 1984 either to the Academic Medical Centre, University of Amsterdam (30 patients) or to the Leiden University Hospital (6 patients), in whom AIDS was diagnosed before 31st December 1984. In each case the diagnosis of Kaposi's sarcoma was proven histologically. Pneumocystis carinii pneumonia and other infections were confirmed by culture results and/or histological examinations and/or a diagnostic serological profile, except for 3 cases of Toxoplasma gondii encephalitis, which were diagnosed on the basis of typical CT-scan abnormalities and striking radiological and clinical improvement upon anti-toxoplasmosis therapy.

T-lymphocyte membrane phenotypes of peripheral blood lymphocytes were determined by a cytofluorometric method (Coulter Epics-C) using monoclonal antibodies to mature T-cells (leu-4 or OKT3) or to helper/inducer (leu-3 or OKT4) and suppressor/cytotoxic (leu-2 or OKT8) T-cell subsets and a fluorescein-conjugated goat anti-mouse IgG. Ratios of helper/suppressor lymphocytes lower than 0.8 were scored as depressed.

All material for histopathological studies was processed according to a protocol. A postmortem was performed in 22 cases. As soon as possible after death, mostly within 2 hours, tissue specimens were collected from all affected organs for microbiological studies. In order to ensure optimal immunohistological, electron-microscopic and histopathological studies, fragments of tissue from all organs were fresh-frozen in liquid nitrogen and fixed in Karnovsky's fixative and in 4% buffered formalin respectively. Routinely, 5 µ paraffin sections of all organs were stained with haematoxylin-eosin, PAS, PAS following diastase digestion, Grocott's stain, Ziehl-Neelsen stain, and the elastic Van Gieson stain, covering all opportunistic infections and malignancies. Biopsy material from living patients (intestinal tract, lungs, lymph nodes, etc.) was processed in the same way.

Antibodies to HTLV-III were measured using an ELISA developed by W.J.A. Krone and others at the department of virology, University of Amsterdam, using a H₉-HTLV-III cell lysate⁶⁷.

Results

The mean age of our patients was 39.5 years (range 23-57). All patients were males, all except one being homosexual or bisexual men with an active sexual life. The one exception was a heterosexual monogamous man who had received several blood transfusions during heart surgery in the USA, 4 years prior to the first symptoms of AIDS. Thirty-one of the patients were of Dutch nationality. The great majority reported sexual contacts in the USA or with persons from the USA. Four patients had Kaposi's sarcoma only: 24 patients (67 per cent) had opportunistic infections and 8 (22 per cent) had both Kaposi's sarcoma and opportunistic infections. Table I lists the prodromal complaints; 32 of the 36 patients had one or more complaints; only 3 patients with cutaneous Kaposi's sarcoma and one patient presenting with acute cryptococcal meningitis reported no previous symptoms. Malaise and fatigue were almost invariably present, followed by unexplained weight loss and unexplained fever. The mean interval between onset of symptoms and diagnosis of AIDS was 9.7 months (range 0.5-36). Table II lists the infections or malignancies considered as evidence of the existence of AIDS. Most frequently Pneumocystis carinii pneumonia led to diagnosis, followed by Kaposi's sarcoma.

At examination at the time of diagnosis most patients had signs of recent weight loss. Weight/height² was low: $19.6 \pm 1.6 \text{ kg.m}^{-2}$; 40 per cent had fever and 40 per cent were dyspnoeic. Lymphadenopathy (two or more non-adjacent enlarged lymph nodes) was found in 36 per cent, hepatosplenomegaly in 25 per cent. Dermatological abnormalities were seen frequently: half the patients presented with a candida infection of skin and/or mucous membranes, a quarter with Kaposi's sarcoma and 15 per cent with herpes infection.

TABLE I: PRODROMAL SYMPTOMS IN 36 AIDS PATIENTS

<i>Prodromal symptoms</i>	<i>Number of patients</i>	<i>%</i>
Malaise and fatigue	30	83
Weight loss	26	72
Fever	21	58
Night sweat	17	47
Cough	16	44
Diarrhoea	13	36
Nausea/vomiting	4	11
Neurological or psychiatric abnormalities	4	11
Lymphadenopathy	14	39
Cutaneous or mucous membrane abnormalities	14	39

TABLE II: PRESENTING DISORDERS WHICH HAVE LED TO THE DIAGNOSIS OF AIDS IN 36 PATIENTS

Presenting disorder	Number of patients
Pneumocystis carinii pneumonia	15
Kaposi's sarcoma	10
Oesophagitis caused by Candida albicans	4
Pneumonia caused by Candida albicans	1
Pneumonia caused by cytomegalovirus	1
Encephalitis caused by Toxoplasma gondii	1
Enteritis caused by Isospora belli	1
Enteritis caused by Cryptosporidium spp.	1
Meningitis caused by Cryptococcus neoformans	1
Septicaemia caused by Mycobacterium tuberculosis	1

In table III some laboratory findings are grouped together. There was slight leucopenia and marked lymphopenia in the peripheral blood: 65 per cent of the patients had an absolute lymphocyte count of less than $1.0 \times 10^9/l$. The absolute number of OKT4-positive lymphocytes and the ratio between OKT4-positive and OKT8-positive cells were below normal in all patients except one, who presented with a solitary Kaposi's sarcoma. He was treated locally, but unfortunately he withdrew from follow-up after 3 months. In-vitro lymphocyte responses to phytohaemagglutinin antilymphocyte serum were disturbed in 34 cases (exceptions were the abovementioned patient with Kaposi's sarcoma and another patient presenting with this disorder). The immunoglobulin levels were increased. Antibodies to HTLV-III were found in 100 per cent of our patients.

Infections and malignancies

Fig. 1 lists the opportunistic infections and malignancies diagnosed during life. Two types of malignancies considered part of the AIDS syndrome were

seen: non-Hodgkin lymphoma (maxillary region) in 1 case and Kaposi's sarcoma (cutaneous and/or intestinal localizations) in 12 cases. Of the 32 patients with opportunistic infections, 21 had Pneumocystis carinii pneumonia. In 5 cases there was a co-existing lung infection with cytomegalovirus and in one case a co-existing infection with Candida albicans. Opportunistic bowel infections were encountered 7 times, mostly due to Cryptosporidium spp. Central nervous system involvement was seen in 11 cases. In 7 patients a clinical picture of 'progressive presenile dementia' developed with severe cerebral atrophy on CT-scan. Ophthalmological examination revealed cottonwool spots and/or presumed CMV retinitis in 4 patients. Chronic perianal ulcerative herpes simplex lesions were found in 4 patients. Disseminated infection with the unusual human pathogen Mycobacterium avium intracellulare was seen in 5 cases, mostly found by culture of bone marrow, buffy coat and/or blood.

Apart from the opportunistic infections many other infections were seen. In most cases there was severe oropharyngeal candidiasis, sometimes relapsing despite treatment. Other infections seen were syphilis, Salmonella sepsis, shigellosis, giardiasis and amoebiasis, but no distinctive pattern of non-opportunistic infections appeared. Fig. 2 shows the number of opportunistic and non-opportunistic serious infections diagnosed during life in the 36 patients. A mean of two opportunistic infections and one non-opportunistic infection was found per patient. Only two patients, both presenting with Kaposi's sarcoma, remained free from infections; one of them was lost for follow-up after 3 months of observation and the other has been observed now for 9 months. Almost all patients had evidence (serology and/or isolates) of past or present EBV, CMV and hepatitis B infections. Details about this will be reported elsewhere⁶⁸.

TABLE III: SOME LABORATORY FINDINGS IN 36 AIDS PATIENTS AT THE TIME OF DIAGNOSIS

	Number	Mean	Range	Normal values (95% confidence interval)
Haemoglobin (mmol/l)	34	7.2	4.2 - 10.9	8.1 - 9.9
Leucocytes ($\times 10^9/l$)	35	4.8	2.1 - 12.2	4.0 - 11.0
Lymphocytes ($\times 10^9/l$)	34	0.9	0.2 - 2.9	1.0 - 3.5
Platelets ($\times 10^9/l$)	34	206	95 - 350	150 - 350
OKT4-positive cells ($\times 10^9/l$)	32	0.17	0.01 - 0.62	0.5 - 2.0
OKT8-positive cells ($\times 10^9/l$)	32	0.54	0.01 - 2.18	0.2 - 1.4
OKT4/OKT8 ratio	33	0.36	0.03 - 1.02	0.8 - 3.2
IgG (g/l)	22	19.3	7.0 - 38.0	8.0 - 19.2
IgM (g/l)	22	3.8	0.8 - 18.3	0.8 - 3.6
IgA (g/l)	22	5.6	0.9 - 17.1	0.7 - 4.1

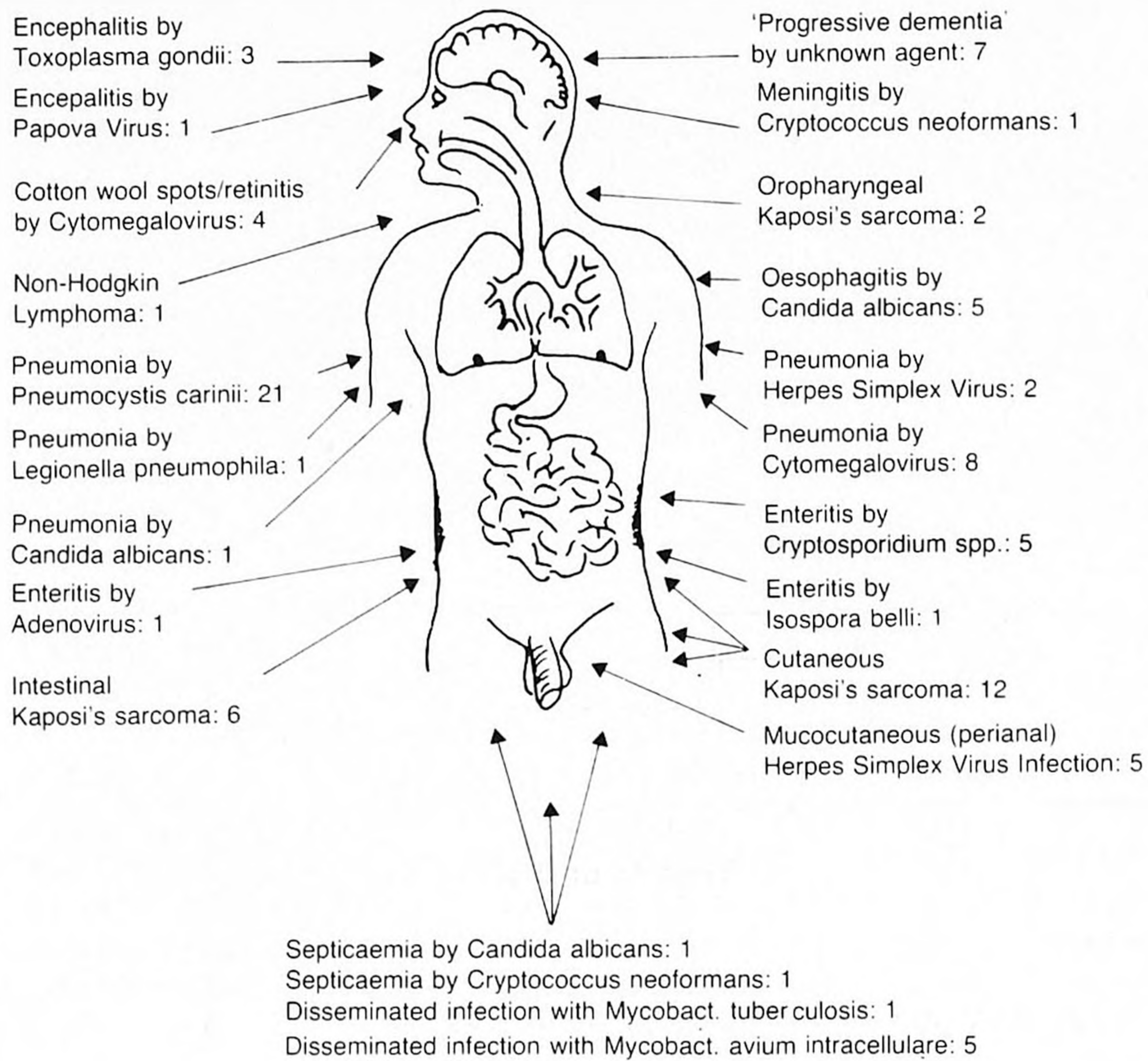


Fig. 1. Opportunistic infections and malignancies in AIDS. I. Findings during life since diagnosis in 36 patients.

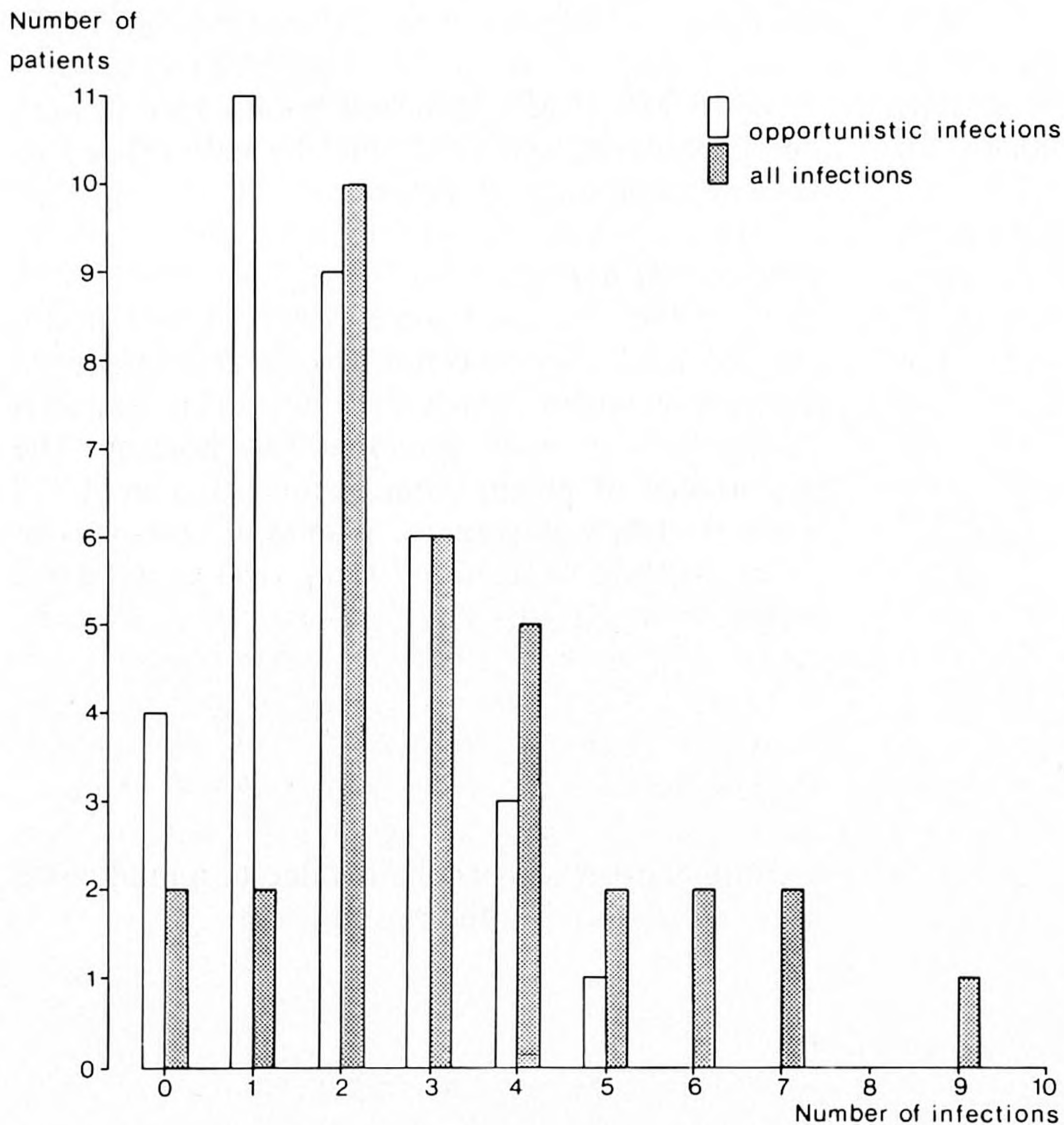


Fig. 2. Number of opportunistic infections and of all infections since diagnosis in 36 AIDS patients.

Survival rate

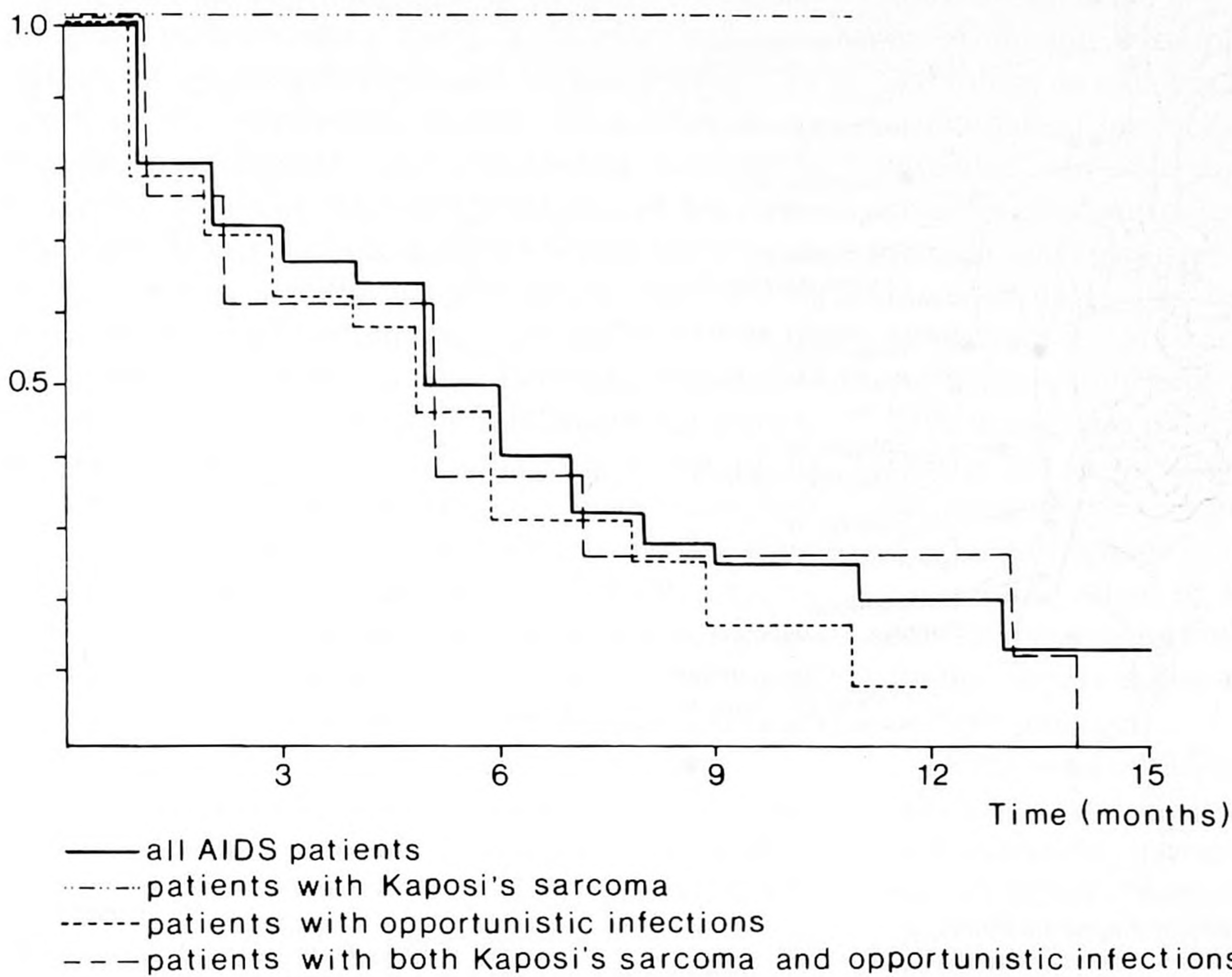


Fig. 3. Actuarial survival rate in 36 AIDS patients since diagnosis, in four categories.

Outcome

The prognosis of the disease is poor. So far, 26 of 36 patients have died. Fig. 3 shows the actuarial survival curve. Very remarkably, the patients with only Kaposi's sarcoma are still alive (one of them lost for follow-up).

Table IV lists the causes of death in 26 patients. Pneumonia was the most important cause of death. Although infections with *Pneumocystis carinii* were frequently seen in those patients, that organism was

TABLE IV: CAUSES OF DEATH IN 26 AIDS PATIENTS

Causes of death	Number of patients
Pneumonia caused by <i>Pneumocystis carinii</i> and CMV	5
Pneumonia caused by <i>Pneumocystis carinii</i> and <i>Candida albicans</i>	1
Pneumonia caused by <i>Pneumocystis carinii</i>	1
Pneumonia caused by bacterial cause	7
'Progressive dementia'	2
Intracerebral haemorrhage	2
Progressive multifocal leucoencephalopathy	1
Septicaemia caused by <i>Staphylococcus aureus</i>	1
Septicaemia caused by <i>Cryptococcus neoformans</i>	1
Septicaemia caused by <i>Candida albicans</i>	1
Septicaemia caused by <i>Mycobacterium tuberculosis</i>	1
Acute cardiac death	1
Unnatural death	2

the sole infectious agent responsible for a fatal pneumonia in only one case. On the other hand, 5 of 7 severe lung infections caused by both *Pneumocystis* and CMV (CMV inclusion bodies seen in lung biopsy material and confirmed by culture) led to intractable respiratory failure.

Postmortem findings

In 21 of the 26 cases permission for a postmortem was obtained. Fig. 4 lists the opportunistic infections and malignancies which had not been detected during life but were found at postmortem. The importance of postmortem examination in AIDS cases is clearly illustrated. Numerous episodes of fever, wasting or localized symptoms of unknown origin, were explained by the postmortem findings. Organ involvement by *Mycobacterium avium* intracellulare, cytomegalovirus, *Cryptococcus neoformans* and Kaposi's sarcoma was frequently found. Besides the clinical syndrome of progressive dementia due to an unknown agent in 7 patients, two additional cases of encephalitis due to an unknown agent were found at the postmortem.

Discussion

Shortly after its epidemic appearance in the USA, the new disease AIDS reached Europe, emerging

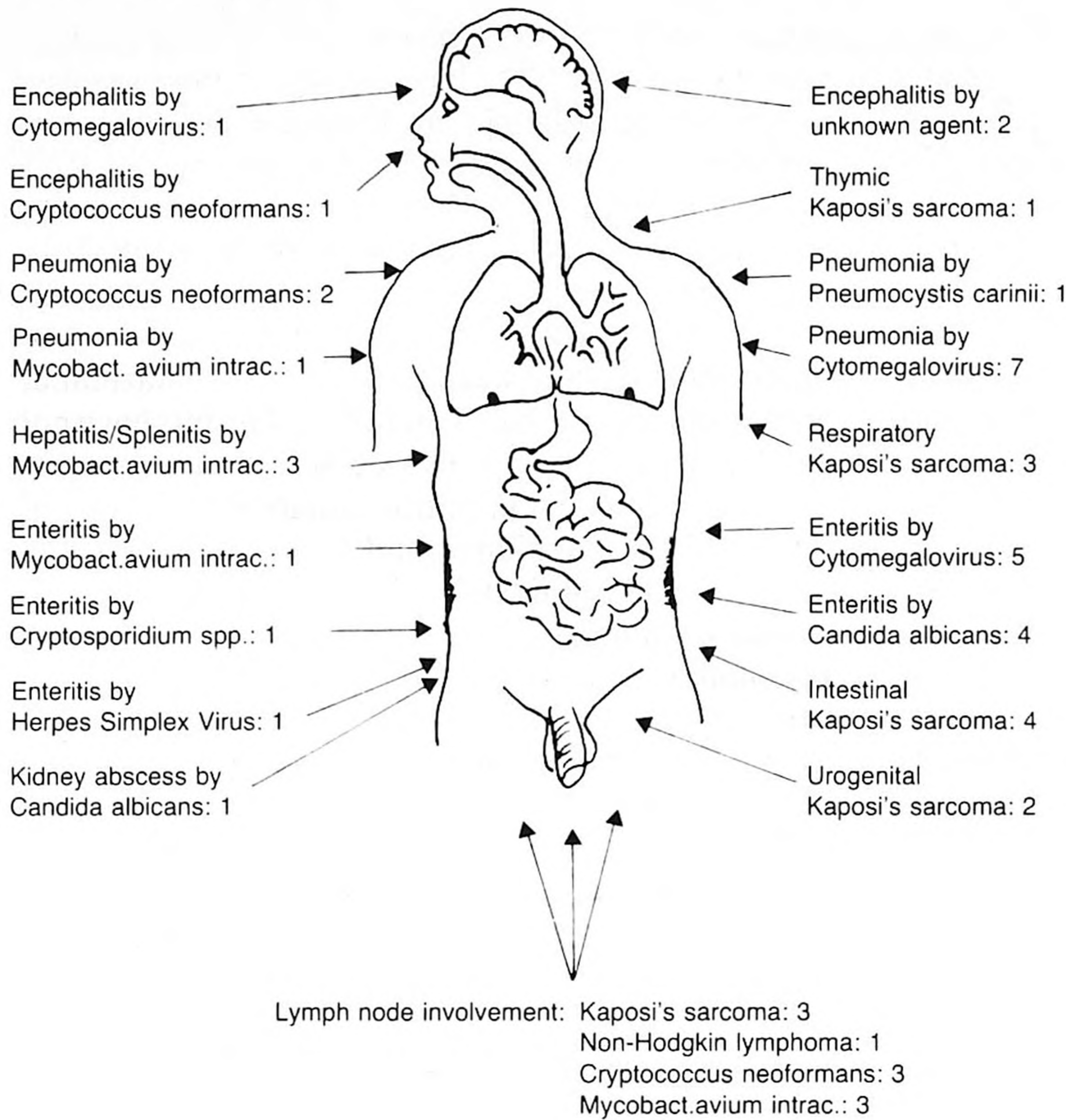


Fig. 4. Opportunistic infections and malignancies in AIDS. II. Additional post-mortem findings in 21 patients.

almost exclusively in urban areas^{24,25}. This article describes the findings in 36 of the 42 patients diagnosed by 31st January 1985 in The Netherlands. When compared with the US data, several differences can be noted: none of the AIDS patients was an intravenous drug user (17 per cent in the USA); so far we have found no haemophiliac (1 per cent in the USA) and seen no female patients (7 per cent in the USA). All patients except one were homosexual or bisexual men with a moderately or highly active sexual life.

Two distinct features of the syndrome are the multiple simultaneous infections and the poor prognosis. Many deaths are due to intractable opportunistic infections, as clearly illustrated in our study by the fact that all patients with Kaposi's sarcoma without infections have so far survived. Theoretically, the poor prognosis might be improved by reconstitution of the impaired immune system. No patient has so far regained intact immune responses spontaneously, nor has any therapeutic regimen succeeded in restoring immunocompetence⁶⁹⁻⁷¹. All that can be done at the moment, therefore, is treatment of the infections and the malignancies.

Unfortunately, for many of these opportunistic infections no effective treatment is known, and for

others therapy gives some clinical improvement, but seldom eradication of the micro-organism. *Pneumocystis carinii*, the most important cause of life-threatening pneumonia in AIDS patients, can be treated effectively with trimethoprim-sulphamethoxazole or pentamidine⁷²⁻⁷⁴. Our results support this: although 21 patients experienced a pneumocystis infection, only 7 died from this cause. Moreover, in 6 of these 7 cases there was a co-existing lung infection (CMV in 5 cases, *Candida albicans* in 1). In our experience, supported by the literature⁷⁵, it is mandatory for successful treatment of pneumocystis pneumonia to start treatment as soon as possible, and especially before respiratory insufficiency becomes evident. The extremely high incidence of this potentially treatable infection in AIDS patients warrants a thorough search in each person at risk. Beside physical examination and chest X-ray this includes more sensitive techniques such as ⁶⁷Gallium lung scintigraphy and determination of a gas diffusion parameter such as CO transfer capacity⁷⁴⁻⁷⁵. If the results of all these examinations are normal, the likelihood that a patient has a pulmonary infection is negligible. If one or more of the results are abnormal, fibre-optic bronchoscopy with broncho-alveolar lavage and transbronchial biopsy must follow⁷⁴⁻⁸².

The biopsy and lavage specimens should be processed with appropriate stains or cultures for pneumocystis, mycobacteria, fungi, legionella, and such viruses as cytomegalovirus and herpes simplex; in addition, the specimens should be submitted to routine pathological and cytological analysis⁷⁴. Using this protocol, we found evidence of pneumocystis infection in 3 of our patients before there were any pulmonary symptoms and signs or chest X-ray abnormalities. Unfortunately, adverse reactions to co-trimoxazole occur in a large percentage of AIDS patients^{75,83,84} and a serious allergic reaction, prompting discontinuation of this drug, was found in one-third of our patients. Toxoplasmosis is another infection that can be treated effectively by drug therapy⁸⁵. Life-long therapy is probably necessary^{86,87}. In our 3 patients with postulated toxoplasma encephalitis, institution of pyrimethamine-sulphadiazine therapy caused prompt disappearance of clinical symptoms and CT-scan abnormalities.

A striking neurological syndrome, for which there is no treatment at present, is unexplained progressive dementia⁸⁸. Many AIDS patients eventually develop this encephalopathy⁸⁸, and so far it has been found in 7 of our patients. In 2 it was considered to be the direct cause of death, and in 5 others it contributed to death caused by fulminant bacterial pneumonia. Symptoms start with apathy, followed by progressive mental deterioration. The patient is apathetic, bedridden, assumes a foetal position and becomes unable to perform the activities of daily living. At last diminished consciousness, somnolence, and a comatose state develop. Pseudobulbar reflexes are found, but no focal neurological symptoms. The CT-scan reveals diffuse cerebral atrophy. Recently, HTLV-III virus has been found in brain cells of such patients, suggesting that the syndrome is the direct result of infection with this virus⁸⁸.

Common AIDS-related infections which are difficult to treat include those with the coccidial parasites *Cryptosporidium* spp. and *Isospora belli*^{89,90}. Unlike the pattern in the immunocompetent, where the disease is usually self-limiting⁹¹⁻⁹³, they cause severe malabsorption and devastating intractable diarrhoea in AIDS. In our patient with *Isospora belli* infection we successfully used the veterinary drug amprolium⁹⁴. For cryptosporidiosis the therapeutic outlook at the moment is bleak^{89,90}.

For several other opportunistic infections there is no specific treatment as yet. Of these, disseminated infection with *Mycobacterium avium intracellulare* must be mentioned separately. The organism has been isolated from blood and bone marrow in 10-30 per cent of patients, and has also been identified in

lymph nodes, liver, spleen, soft tissues, lungs, sputum and urine⁹⁵⁻⁹⁷. The exact role of this organism in producing systemic or localized symptoms or pathology is still unclear. So far, no drug or drug combination has been documented to be clinically effective⁹⁷. In-vitro studies usually show resistance to conventional antimycobacterial drugs. Excellent in-vitro activity against *Mycobacterium avium intracellulare* isolates has been found with clofazimine, ansamycin and amikacin, but clinical results have not yet been published⁹⁷. In our series disseminated *Mycobacterium avium intracellulare* was diagnosed during life in 5 patients, and in an additional 7 at postmortem examination. In one of our patients, similar to findings of others^{98,99}, small bowel lesions resembling those of Whipple's disease, but due to *Mycobacterium avium intracellulare* infection, were found. Apart from this case no clearcut disease pattern emerged.

Of the viral infections, especially cytomegalovirus takes a heavy toll. It causes considerable morbidity and mortality, particularly in terms of pneumonia, oesophagitis, retinochoroiditis and dissemination^{97,100}. It may be a cause of adrenal insufficiency in AIDS patients^{101,102}. It was cultured from the throat and urine of nearly all our patients. In our series, 5 of 8 patients with pulmonary CMV involvement developed fatal respiratory failure. In at least 2 patients ocular disorders were ascribed to CMV infection. As opposed to herpes simplex and herpes zoster infections, there is currently no effective therapy for disease caused by CMV⁹⁷.

Although AIDS may be associated with a wide range of malignancies (including primary central nervous system lymphoma), disseminated Kaposi's sarcoma is by far the most common¹⁰³. Together with pneumocystis pneumonia it led to recognition of the new syndrome²⁻⁴. Although AIDS-related Kaposi's sarcoma is histologically indistinguishable from more classic forms, it almost invariably takes a more rapidly progressive course, resembling that seen in iatrogenically immunosuppressed patients^{4,103-107}. Patients present with skin lesions, but at that time there is often already co-existing lymph node and visceral (especially gastrointestinal tract) involvement^{4,103,106,107}. Careful examination of the oral cavity is mandatory in AIDS patients, since in one out of 3 with Kaposi's sarcoma involvement of the hard palate is found¹⁰³. In one of our patients hard palate involvement was the only evidence of Kaposi's sarcoma found during life.

In view of the distinctive characteristics of AIDS-related Kaposi's sarcoma, a new staging classification has been proposed¹⁰⁷. However, the presence

of B symptoms (weight loss, fever, night sweats) and immunological status seem to be more important prognostic factors than the more traditional parameters of tumour size, employed in this system¹⁰³. In agreement with this is that the full natural history of AIDS-related Kaposi's sarcoma is not known at the moment, since patients sooner or later die from opportunistic infections (occult infections presumably being the cause of B symptoms, and opportunistic infections being indicative of a worse immunological status than Kaposi's alone)¹⁰³. Evidence of Kaposi's sarcoma was found in our series in 18 (50 per cent) patients. This reflects the high prevalence of this disorder in homosexual or bisexual men, as opposed to other risk groups²³.

Several treatment regimens have been tried in AIDS-related Kaposi's sarcoma. The most extensively evaluated single agent cytotoxic drugs have been vinblastine and the podophyllotoxin VP-16. For the former drug the reported complete response rate is 5 per cent (complete and partial response rate 37 per cent); for VP-16 it is 38 per cent (complete and partial response rate 79 per cent)^{103,108-110}. Total response rates of about 40 per cent have been found with recombinant alpha interferon^{103,110-112}. There is no agreement on optimal interferon dosage yet, high dosage often being limited by intolerable subjective symptoms (malaise, fever, headaches)^{103,110-112}. Combination chemotherapy with doxorubicin, bleomycin and vinblastine (DBV) has been abandoned in view of a high rate of opportunistic infections (50 per cent) and the possibility of aggravating immune suppression^{103,110}. At New York University Medical Center a trial with concurrent therapy with VP-16 and recombinant alpha-2 interferon is now in progress, but results have not yet been reported¹¹³. At our centre we use a modified, similar protocol. So far, 3 patients have been treated with VP-16 alone, with one partial response and 2 not responding. The responder stopped therapy after 3 courses because of side effects (malaise, alopecia), and Kaposi's sarcoma soon became progressive again. Half a year later he died from an opportunistic infection. Another patient was treated concurrently with VP-16 and recombinant alpha-2 interferon and showed a partial response. He, too, died from an opportunistic infection. The patient with the single presenting lesion who was lost for follow-up, was treated locally (excision and postoperative radiotherapy).

AIDS is the most dramatic expression of infection with a newly discovered retrovirus, called LAV/HTLV-III³⁰⁻⁵⁵. At present it is estimated that about 7 per cent of those infected by the virus will develop AIDS⁴⁴ but, considering the long incubation period,

this may be an underestimation. The disease poses a serious threat to persons at risk and has already been the cause of immense human suffering. Our efforts should focus on providing appropriate care and finding effective therapies (anti-HTLV-III drugs, immunomodulation?) for those affected, and on protection (screening of blood donors, development of a vaccine) of those at risk, but not yet infected.

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