Brief Review

AIDS and the anaesthetist

Angelita S. Cordero MD, John T. Bonner MD,
Russell K. Brynes MD

First reported in June, 1981, the acquired immunodeficiency syndrome (AIDS) ultimately manifests as life threatening opportunistic infections with or without Kaposi's sarcoma or other malignancies (Table).^{1,2} Most cases have occurred in four groups now considered to be at high risk: homosexual males, intravenous drug abusers, Haitians, and haemophiliacs. In addition, cases have been reported in women having sexual relations with males in high-risk groups, in children of individuals at high risk, and in individuals receiving blood transfusions.^{2,3} Less than seven per cent of reported cases have no recognizable risk factors.

The immune deficiency in this disease is now thought to be due to infection by a newly discovered retrovirus known as lymphadenopathy-associated virus (LAV) or human T-lymphotropic virus-III (HTLV-III).^{4,5} This agent appears to be transmissible by the venereal route as well as through blood or blood products.^{3,6}

Clinical features

The clinical presentation of AIDS can be insidious with a variety of constitutional symptoms such as fever, night sweats, fatigue, malaise, weight loss,

and diarrhea. The acute onset of opportunistic infection most commonly *Pneumocystis carinii* pneumonia, usually brings attention to the diagnosis. However, many individuals at risk may manifest prodromal symptoms without developing an acute opportunistic infection.

Approximately 25 per cent of AIDS cases have presented with Kaposi's sarcoma.⁷ This tumor presents as multiple red-brown to violet cutaneous patches, macules, or nodules often on the extremities. They are usually painless and can appear without any other signs or symptoms. It is commonly found in the gastrointestinal tract from the oropharynx to the rectum, but may arise in lymph nodes or in any organ in the body.

Non-Hodgkin's lymphomas, while less frequent-

TABLE Severe opportunistic infections and malignancies associated with the acquired immunodeficiency syndrome*

Viruses	Bacteria
Disseminated CMV	Disseminated mycobacterium avium-intracellulare
Chronic mucocutaneous Herpes simplex virus	Disseminated mycobacterium tuberculosis
Papova virus (progressive multifocal leuko-encephalopathy)	
Fungi	Protozoa
Esophageal candidiasis	Pneumocystis carinii pneumonia
	Cryptosporidial gastroenteritis
	Strongyloidiasis pneumonia or disseminated infection
Cryptococcal meningitis or disseminated infection	Toxoplasma gondii encephalitis or disseminated infection
Malignancies	
Kaposi's sarcoma (often multicentric)	
Non-Hodgkin's lymphoma (high grade, often of central nervous system)	

*Modified from Selik *et al.*¹

Key words

IMMUNE SYSTEM: immunodeficiency, opportunistic infection, protective measures; OCCUPATIONAL HAZARDS.

From the Departments of Anaesthesiology, and Pathology and Laboratory Medicine, Emory University School of Medicine at the Atlanta VA Medical Center and Emory University Hospital.

Address correspondence to: Dr. Angelita S. Cordero, Department of Anesthesiology, Atlanta VA Medical Center, Decatur, Georgia 30333.

ly encountered than Kaposi's sarcoma, have a much higher than expected incidence in AIDS. These tumours frequently involve the central nervous system, and belong to highly aggressive histologic categories.⁸

Lymphadenopathy syndrome

For some individuals from high risk groups, a lymphadenopathy syndrome characterized by chronic generalized lymph node enlargement may represent an early or mild manifestation of AIDS.⁹ The sites of lymphadenopathy often include bilateral cervical, axillary and inguinal nodes, and less frequently supraclavicular and epitrochlear nodes. A variety of constitutional symptoms similar to those found in the prodrome of AIDS are also found in these individuals.⁹

Laboratory Features

The most important laboratory abnormalities in patients with AIDS occur in the immune system. The T-helper to T-suppressor ratio is usually lowered (less than 0.9) due to a striking loss of the T-helper cell subset although T-suppressor cells may be reduced as well. The absolute lymphopenia (less than 1500/cu.mm.) that is produced can be readily evaluated by a white blood cell count with differential, as well as by enumeration of T-cell subsets. There is usually cutaneous anergy to recall antigens and commonly a polyclonal elevation of immunoglobulins, usually of the IgG or IgA class, is seen.² Anemia, neutropenia and less frequently immune thrombocytopenia are observed in AIDS, and occasionally pancytopenia may be present.¹⁰

Prognosis

Patients with AIDS have a grave prognosis with an ultimate overall mortality rate exceeding 80 per cent. In patients with other manifestations of the AIDS spectrum the situation is less clear. Individuals with the lymphadenopathy syndrome are currently being followed to see if this is a self-limited or milder form of the disease. To date, only a small number of these patients have developed full blown AIDS.

Anaesthetic Management and Protective Measures

The anaesthetist participating in the diagnosis and management of patients with AIDS has contact with the patient in the operating room and in the intensive

care unit. The patient may require an anaesthetic for obtaining diagnostic biopsy material and the critically ill patient with AIDS will need forms of major life support such as artificial mechanical ventilation. It is in this setting that the anaesthetist comes in contact with potentially infectious materials including blood, saliva, urine, feces, and cerebrospinal fluid.

At the time of this writing no cases of AIDS have been reported in physicians resulting from direct contact with AIDS patients or laboratory samples.¹¹ Five hospital workers have developed AIDS although the circumstances regarding their risk factors are vague.¹² Because of the potential for transmission, however, the United States Public Health Service, Centers for Disease Control (CDC) have recently issued recommendations to personnel in the health professions in order to control and minimize the possible risk of infection from individuals with AIDS.¹³

Like hepatitis B, the possible routes of transmission of AIDS include: direct percutaneous inoculation by needle of contaminated serum or plasma, transfusion of infected blood or blood products, non-needle percutaneous transfer of infective serum or plasma through open wounds, and introduction of infective serum or plasma onto mucosal surfaces.

Personal protective measures in providing care to AIDS patients begin with careful preoperative review of history, the physical examination and pertinent laboratory data. In high risk groups, laboratory data should include absolute lymphocyte count, immunoglobulin levels, skin tests for cutaneous anergy, helper to suppressor T-cell ratio and hepatitis B surface and core antigen and antibody determinations. Clinical history may identify the patient as a member of a high risk group or as having previously had an opportunistic infection such as those shown in the Table.

Information from the surgeon or internist should be gathered indicating why the biopsy is done. Physical examination may disclose needle tracks, generalized lymphadenopathy or the characteristic red-brown plaques of Kaposi's sarcoma. These findings should alert to the possible diagnosis of AIDS.

We have modified the following precautionary measures advocated by the CDC and others:^{14,15}

- 1 Carefully avoid accidental wounds from sharp instruments contaminated with potentially infectious material and avoid contact of open skin

- lesions with material from documented or suspected AIDS patients.
- 2 Gloves should be worn when intubating, inserting nasogastric tubes, catheters, intravenous and arterial lines; gloves are recommended for handling blood specimens, blood soiled items, body fluids, excretions and surfaces and materials exposed to them.
 - 3 Gowns should be worn when clothing may be soiled with body fluids, blood secretions or excretions. Hands should be washed after removing gowns and gloves and before leaving rooms of known or suspected AIDS patients, and if they become contaminated with blood.
 - 4 Disposable items should be incinerated or disposed of in accordance with the hospitals' policies for disposal of infectious wastes.
 - 5 Reuseable items should be reprocessed in accord with hospital policies for hepatitis B virus contaminated items.
 - 6 Needles and sharp instruments must be placed promptly in a puncture-resistant container used solely for such disposal. Needles should *not* be reinserted into their original sheaths before being discarded into the container, since this is a common cause of needle injury. Disposable needles and syringes of course should be used.
 - 7 Disposable breathing circuits should be employed whenever possible. Anaesthesia equipment surfaces may be decontaminated with a disinfectant such as a 1:10 dilution of 5.25 per cent sodium hypochlorite in water (household bleach) following any spill of potentially infectious material. Special care should be exercised to avoid contaminated blood, blood products and body secretions or excretions which may come in contact with skin, mucous membranes or eyes through spray aerosolization or by self inoculation. Clinical laboratory specimens and tissue samples should be labeled clearly with a special warning such as "AIDS PRECAUTIONS" or "BIO-HAZARD". Positive or suspicious specimens should be placed in a second container such as a sealable plastic bag for transport to the laboratory.
 - 8 Exercise increased caution in transfusion of blood and blood products, and encourage use of autologous rather than allogeneic blood for elective surgery.⁶
- Devices used for resuscitation (preferably disposable) should be available at the bedside of

patients with suspected or documented AIDS. These should include: self-inflating bags, endotracheal tube equipment and other devices needed for resuscitation. Other patients with potentially transmissible infections like hepatitis B or tuberculosis should be treated in a similar manner. The immediate availability of these devices will protect personnel performing resuscitation from the risk of mouth-to-mouth resuscitation in the patient with AIDS or other diseases with similar transmissibility.¹⁵

The risk of developing AIDS by health care personnel is as yet unknown, but appears small. Strict adherence to precautionary measures such as those outlined above, and common sense should minimize the risk to the anaesthetist and other health care personnel from exposure to this severe medical disorder.

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