In the poor rural communities in which this disease occurs, disability is not just a personal problem. Infection is most common in the 15–45 year age group—i.e., the working population—and in many endemic areas coincides with the season of peak agricultural activity so that socioeconomic effects can be substantial; in India, for instance, some 11·7 million man days are lost annually.[12] Various benzimidazole compounds have been found to reduce the inflammation associated with emergence of worms and to lessen the period of disability[13] but they seem to have no direct antiparasitic action and thus mass chemotherapy is not feasible as a control measure.[7] However, chemotherapy may still have an important part to play, since control of infection has been reported in 16 of 17 rural village communities in western Nigeria following eight years of surveillance and treatment of infected cases. The success was attributed to the incidental bandaging of the lesions, which prevented contamination of the water sources, rather than to any action of the chemotherapeutic agents; but the possibility of treatment did encourage patients to attend the clinic before they entered the water.[14] In Ghana only 0·5% of patients attended a health clinic.[8]

In theory, control of dracunculiasis is easy; a measure as simple as sieving all drinking-water through a cloth will provide protection at the individual level. The conversion of step wells to draw wells has been sporadic in India, with some diminution in recent years; and this measure was primarily responsible for elimination of the disease from the Soviet Union (Uzbekistan) in 1932. 1981–90 has been designated by many international agencies, including U.N.D.P., W.H.O., and the World Bank, as the International Drinking Water Supply and Sanitation Decade. This has stimulated interest in the control of dracunculiasis,[15–17] the only communicable disease that can be entirely eliminated by substituting safe for unsafe water, since no other mode of transmission exists. In May, 1981, the 34th World Health Assembly noted that the control of dracunculiasis would provide a very good monitor of the success of the programme to provide safe water. In India, the Government is already committed to providing safe water in all communities by the end of the decade and about 80% of the guineaworm-infected villages are already scheduled for provision of better water supplies, often because of the risk of other water borne diseases such as cholera, infective hepatitis, typhoid, poliomyelitis, and diarrhoeal diseases. Where piped water supplies are provided, guineaworm infection usually vanishes completely, but this solution is not economically feasible in most endemic areas. Where possible, safe tube wells or bore wells will be provided but meanwhile it is intended to treat all existing sources with the insect larvicide temephos at 1 part per million. This compound can be safely added to potable water and cyclops-killing power lasts about 6 weeks so dosing will be repeated at intervals throughout the transmission season. This will be combined with vigorous local health campaigns and the target is complete eradication by 1985. The programme is being organised and funded centrally through the National Institute of Communicable Diseases in Delhi, which has been responsible for training all district health officers and engineers from each State concerned. Actual measures will be carried out by existing staff at primary health centres and by village health workers.

The prospects for elimination of guineaworm disease from countries in Africa are not so good, principally because the basic demographic and surveillance data are lacking and also in many West African countries because there is widespread migration of labour. Indeed, new foci have lately been reported from Ethiopia, Kenya, and Ghana. An international workshop on the opportunities for control of dracunculiasis, sponsored by the Office of International Affairs of the U.S. National Research Council, was held in Washington in June, 1982, and the recommendations[18] should provide government health authorities with guidelines on how to determine the extent and magnitude of infection at national level and, if they are then convinced of the importance of the disease, on which interventions are the most appropriate and feasible. In most endemic areas of Africa, well-conceived control campaigns, on a wide enough scale to prevent reintroduction and integrated with schemes to provide better water supplies, are capable of greatly reducing prevalence at low cost before the end of the decade.

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Acquired Immunodeficiency Syndrome

A YEAR ago we commented on the extraordinary outbreak of Kaposi's sarcoma and pneumocystis pneumonia in young White American homosexuals.[1] Since then the number of cases notified to the Centers for Disease Control in Atlanta has risen at a rate of about 70 cases a month, to 788. Much has been learnt of the clinical aspects of this "acquired immunodeficiency syndrome" (AIDS), but its pathogenesis remains a mystery.

There are at least four major populations at risk in the U.S.A.:[2] about 75% of patients are homosexual males;

1. Editorial. Immunocompromised homosexuals. *Lancet* 1981; ii: 1325–26.
2. Centers for Disease Control. Update on acquired immune deficiency syndrome (AIDS)—United States. *Morbid Mortal Wkly Rpt* 1982; 31: 507–14.

13% are intravenous drug abusers with no history of homosexuality; 6% are Haitian immigrants who are not homosexual and do not abuse drugs;[3] 0·7% are haemophiliacs;[4] and about 5% have no apparent risk factors. The syndrome is not restricted to White males: 20% of cases have been in Blacks and 20% in people of Hispanic or other racial group; and women are not exempt,[5] although they account for only about 6% of notifications. New York and California continue to be responsible for most notifications; "indigenous" cases have been reported from the U.K. and other European countries[6-8] but the numbers are still very small.

The list of opportunist infections has expanded to include most of the bacterial, fungal, and parasitic agents customarily associated with cellular immunodeficiency. Non-Kaposi tumours such as Burkitt-like lymphomas[9] have been encountered, and there is mounting evidence that the full-blown picture of rapidly progressive malignant disease or repeated opportunist infection represents the extreme end of a spectrum. Clinicians in San Francisco and New York have lately noticed a syndrome of fever, weight loss, and generalised lymphadenopathy in the same at-risk populations and without other obvious cause which seems to represent a prodrome of AIDS.[10] Finally the syndrome may well be transmissible: women may acquire AIDs from their male partners;[5,11] and the disease has developed in haemophiliacs after factor VIII administration,[4] in a child after blood-transfusion, and in[12] four infants whose mothers either had or were at risk of AIDS.[13] Thus the case definition for AIDS remains clinically based. Neither Kaposi's sarcoma nor pneumocystis pneumonia is a sine qua non, and the diagnosis must be considered in any young patient (particularly in the at-risk groups) with an unusual neoplasm or severe opportunist infection.

The overall mortality from AIDS is an alarming 40%, and in reality it may be considerably greater since many patients who recover initially die subsequently from malignant disease or overwhelming infection; there are few reports of complete remission.

Early in the investigative work, several risk factors seemed to be important. Amongst the homosexual population promiscuity was a common but not constant finding.[14] Similarly, abuse of sexual stimulants such as amyl nitrite was associated with an increased risk in some[15] but not all[16] studies. This was of interest in view of the potential mutagenicity of these substances[17] and their possible effects on T-lymphocytes.[18] Amyl nitrite is now attracting less interest in view of the apparent extension of the syndrome to non drug-abusing groups. Severe herpes simplex virus infections have been described in AIDS,[19] and virologists have commented also on the widespread seropositivity for Epstein-Barr virus and cytomegalovirus (CMV), often in high titre. Even though CMV may be involved in pathogenesis of the Kaposi tumour[20] and may contribute to the immunodepression, it alone cannot be responsible for AIDS; this has been clear from the outset.

The cellular immunodepression is severe: lymphopenia and skin-test anergy are common, and the in-vitro responsiveness of T cells to a range of mitogens is greatly depressed. Many patients show a striking reversal of the T-helper/T-suppressor ratio, predominantly reflecting a reduction in the T-helper subset.[21] In contrast, humoral immunity generally remains intact: hypergammaglobulinaemia is the rule, and complement components are normal. Amongst other observations are reports of an increased prevalence of HLA-DR5 in affected individuals,[15] of autoimmune thrombocytopenia in 11 patients,[22] and of an unusual acid-labile interferon in the circulation.[23]

Can these confusing clues be assembled into a single hypothesis? Investigation of symptomless homosexuals has revealed immunological abnormalities which become progressively more severe in those with the "lymphadenopathy-wasting" syndrome and fully expressed in AIDS.[24,25] It thus seems reasonable to suppose that the malignant lesions and infections arise,

3. Centers for Disease Control. Opportunistic infections and Kaposi's sarcoma among Haitians in the United States. *Morbid Mortal Wkly Rpt* 1982; 31: 353–61.
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perhaps in people who are genetically predisposed, as a consequence of a profound defect in immune regulation. If the syndrome does prove to be transmissible, this will strengthen suspicion that the immunodepression is due to an infective agent. Such an agent might be entirely novel (*Legionella pneumophila* was unrecognised 10 years ago) or, more likely, a wolf currently in sheep's clothing. In view of the roles of CMV, EBV, and "human T-leukaemia lymphoma virus"[26] in human cancer, search for a retrovirus or similar agent in AIDS might be rewarding.

Meanwhile, clinicians dealing with these patients—particularly patients with the "lymphadenopathy-wasting" syndrome—face many difficulties. How often and how aggressively should they be investigated? Is co-trimoxazole prophylaxis worthwhile? Can they be blood donors? Need they be nursed in isolation (see below)? What advice should be given about sexual intercourse? Satisfactory answers await the unravelling of this mystery; at present the most compelling question is Why now?

PRECAUTIONS AGAINST ACQUIRED IMMUNODEFICIENCY SYNDROME

ON the notion that AIDS may be due to an infectious agent, the U.S. Centers for Disease Control have published recommendations for strict precautions by clinical and laboratory workers.[1] They should avoid direct contact of skin and mucous membranes with blood, blood products, excretions, secretions, and tissues of persons likely to have the syndrome. In addition to suspected AIDS itself, this category includes Kaposi's sarcoma in patients under 60; chronic generalised lymphadenopathy; and unexplained weight-loss and/or prolonged unexplained fever in persons from groups apparently at increased risk of AIDS (homosexual males, intravenous drug abusers, Haitian immigrants, haemophiliacs). Additional precautions are advised for people working with laboratory animals inoculated with known or suspected AIDS material; these may seem excessive when one remembers that the agent is hypothetical and airborne spread is very unlikely—on existing evidence, transmission requires intimate mucosal contact or the parenteral route—but essentially they correspond to the measures appropriate for hepatitis B, which happens to be frequent in the listed high-risk groups not only in New York and California but also in Europe. In the U.K., cases of the syndrome will be sought by monitoring of death certificates for mention of Kaposi's sarcoma, of clinical reports from dermatologists and venereologists, and of laboratory reports of opportunist infection. Such multidisciplinary efforts by national surveillance units should speed evaluation of this disease, whether it turns out to be due to specific infection of predisposed individuals, collapse of immune defences under the onslaught of multiple strains of, say, cytomegalovirus, or some unidentified toxic agent.

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THYROID FUNCTION TESTS—PROGRESS AND PROBLEMS

DEBATE continues on the place of thyroid function tests in admission multiphasic screening (AMS) of hospital patients. The major question is whether the diagnostic yield justifies the performance of these tests in patients with few or no clinical features of thyroid disease. A report from St Louis by Drake et al.[1] suggests that it does not. 135 ambulatory patients on whom serum thyroxine (T_4) was requested were divided retrospectively into three groups, representing those who, on clinical grounds, had a "high", "intermediate" or "low" probability of having thyroid disease. Patients in the high and intermediate probability groups had at least two of the classic signs and symptoms of thyroid disease. There were 67 patients in these two groups, and thyroid disease was confirmed in 9. Of the 68 remaining patients in the low-probability group, who had only one or none of the classic signs and symptoms, thyroid disease was confirmed in only one case. These results are very similar to those previously reported by White and Walmsley,[2] and imply that where there is little or no clinical evidence of thyroid disease, thyroid function tests are of small value.

There is an additional, and perhaps more serious, drawback in performing thyroid function tests on unselected hospital patients. The frequent occurrence of abnormal test results in patients with non-thyroidal illness, such as trauma and several acute and chronic diseases, is well recognised.[3,4] In the more severely ill patients total T_4 is often reduced. Serum tri-iodothyronine (T_3) is reduced in most cases of non-thyroidal illness, with an accompanying increase in reverse-T_3. These changes are due to decreased T_4 to T_3 conversion, coupled with a decreased clearance of reverse-T_3. Basal serum thyrotropin (TSH) levels and the TSH response to thyrotropin-releasing hormone (TRH) are usually normal. Free T_4 levels measured by equilibrium dialysis methods are also usually normal although technical shortcomings in many routine methods, including the free T_4 index, result in misleadingly low levels in many euthyroid patients.

A measure of the difficulties which these interfering effects cause in practice is indicated by the report of Gooch et al.,[4] who assessed the prevalence of abnormalities in thyroid function tests in consecutive admissions to a large medical service in North Carolina. One or more thyroid function tests of a panel of six was abnormal in 70% of 77 patients, about half of whom were elective admissions. This observation serves as a timely reminder that thyroid function tests in hospital patients require careful interpretation if incorrect conclusions are not to be drawn, and inappropriate treatment is to be avoided.

Existing evidence makes a strong case against the non-selective use of thyroid function tests in hospital patients.

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