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HIV infection in children

Millions will suffer

By the end of next year, the World Health Organisation predicts that, world wide, over one million children will be infected with HIV, half of whom will have AIDS.¹ This could increase infant and child mortality by as much as one third, making AIDS a major cause of death among children by the end of the century. Next week a conference will be devoted to the topic, organised jointly by the National Children's Bureau and the National AIDS Trust. Speakers will be urging closer cooperation between the statutory and voluntary sectors in caring for children with HIV infection. How much is known medically about this group?

The first reports of paediatric AIDS concentrated on terminally ill children who had been infected with HIV by their mothers ("vertical transmission").^{2,4} Now the full range and natural course of HIV disease in children are emerging.^{5,6} Early diagnosis of HIV infection is essential because children may develop symptoms suddenly and have a high mortality. The mean incubation period for children infected with HIV is 4-7 years, but for those under 5 years old this is reduced to 2-3 years. The opportunity for effective intervention is therefore small.

Of those infants who acquire HIV infection from their mothers, one in four will develop AIDS in the first year of life; four fifths will have developed AIDS by the end of their fourth year.^{7,8} The European collaborative study reported recently that an estimated 83% of infected children show laboratory or clinical evidence of HIV infection by 6 months of age.⁹ Twenty six per cent had progressed to AIDS by 12 months, and the mortality from HIV related disease was 17%. Subsequently, the disease progressed more slowly, with most children remaining stable during the second year of life.⁹

How may HIV infection be diagnosed in young children, in whom maternal antibodies may persist for up to 18 months? Tests that document infection, such as HIV antigen tests or culture, are not routinely available and may yield false negative results.¹⁰ Hypergammaglobulinaemia has been suggested as an early and sensitive indicator of HIV infection,^{9,11} and without more definitive tests could be used as a surrogate test for HIV infection in children in whom chronic infections have been excluded.

With recent advances in managing adults infected with HIV, paediatricians will want to know which children might benefit from treatment. Factors correlating with or contributing to progression of disease have been evaluated in several cohorts. Two studies found that persistent antigenaemia with loss of core antibody was associated with poor outcome in children.^{12,13} Though measures of viral activity (core antigen levels) had little predictive power, tests of immune activation (serum neopterin and β_2 microglobulin concentrations) and immune deficits (absolute numbers of CD4+ T cells) were shown to predict accurately the progression to AIDS in infants born to mothers infected with HIV (C Courpotin *et al*, C Tuset *et al*, Vith international conference on AIDS, San Francisco, 1990). There is, however, a need to establish the normal range of serum concentrations of neopterin and β_2 microglobulin in children.

Although treatment with zidovudine prolongs survival in adults with low CD4+ counts¹⁴ no placebo controlled trials have been done in children. Though most paediatricians would give zidovudine to children with AIDS, the optimal dosage, route, and frequency of delivery have not been determined. Reports of early phase I trials in children

recommended treatment with high doses of zidovudine,^{15 16} a practice that must now be questioned given that in adults low doses may be adequate. Multicentre trials are urgently needed to evaluate the safety and efficacy of zidovudine in children with early HIV disease.

On 31 December 1990, 32 countries reported a total of 2120 cases of AIDS in children under 13 years of age, half of whom were Romanian children with iatrogenically acquired disease.⁷ The outbreaks of nosocomial HIV infection in Romania and the Soviet Union highlight the continued need for screening of blood donors and for adequate sterilisation of medical equipment. Much has been learnt about vertically transmitted HIV disease, and large cohorts of children with horizontal transmission of HIV now need studying.

So far little attention has been paid to the problem of HIV infection and adolescents. A more complete understanding of the current epidemiology and natural course of HIV disease in this population is urgently required, followed by attempts to ascertain how best to care for infected adolescents. Only then can services be planned for those children now infected who may reach adolescence.

Although the longer term outlook remains unknown, HIV infection appears compatible with prolonged survival, with or without medical intervention. With this will come clinical, psychological, and social problems—for example, are staff and parents prepared to integrate children and adolescents infected with HIV into mainstream schools? And what are the financial implications of caring for “AIDS orphans”—young people who are not themselves infected with HIV but have lost one or both parents from AIDS? The World Health Organisation estimates that in the 1990s more than a million

uninfected children will be orphaned throughout the world as their infected parents die of AIDS.¹⁷

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Avoidable blindness

The numbers affected are still increasing

About 30 million people in the world are blind (20 million more than in 1976), and a similar number are visually handicapped. Four fifths of this visual loss is avoidable. Last year's general assembly of the International Agency for the Prevention of Blindness produced several recommendations for action. Better use should be made of existing scarce resources. One in four of the world's ophthalmologists practise in the United States. In Africa there is an average of one ophthalmologist for every million people, but whereas 85% of Africa's people live in rural areas most of the ophthalmologists work in the large cities.

The needs of the developing world demand local solutions: techniques developed in Western hospitals—for example, yttrium, aluminium, and garnet lasers and intraocular lenses—may be irrelevant to eye work in rural areas of developing countries. In the Third World cataract tops the list of causes of bilateral blindness. Intracapsular cataract extraction and a pair of standard +10.00 glasses would cure half of the world's blind. One third of all patients attending eye clinics require a pair of spectacles—by setting up edging workshops to fit standard spherical lenses into cheap frames much needed spectacles could be provided for less than \$5. The world's poor are not well served by expensive imported eye medications, often unnecessary and harmful mixtures (steroids and antibiotics), promoted by seductive, glossy advertising. Eye drops manufactured in rural hospital pharmacies and put

into recyclable bottles can cater for almost all common eye diseases at a fraction of the price. (The World Health Organisation recently published a paper on the local production of eye drops.)

How should the number of ophthalmologists serving the Third World be increased, and is a Western style training the best preparation for ophthalmologists working in under-equipped rural locations? In Francophone Africa (22 countries with a population of 141 million) four centres providing postgraduate training in ophthalmology (Mali, Senegal, the Ivory Coast, and Zaire) produce only 10 specialists a year, which is hardly enough. An “average” ophthalmologist operates on 300 cataracts each year; half a million new cases of cataract develop annually in Africa, and a backlog exists of three million already blind. Perhaps other staff could be more easily trained—for example, general surgeons and dexterous ophthalmic nursing assistants have been successfully taught cataract surgery elsewhere. Realistic goals for manpower might be one ophthalmologist for every half million people and one cataract surgeon for every 250 000.

Experiences in several countries, most notably in Kenya, have shown the advantages of establishing a national committee for the prevention of blindness. Such a committee, under the auspices of the ministry of health, should include representation from all groups interested in eye care. A national survey into the incidence and prevalence of blindness