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Cover

HIV particles in lymphocyte culture
Courtesy of Prof G Lecatsas, Dept of Virology, MEDUNSA

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As the exponential spread of the HIV virus continues in South Africa, it is appropriate that the Editors of *The Leech* should muster the diverse talents of academics in areas related to the epidemic, to contribute to this edition. From the perspective of an infectious disease specialist, the destruction of the host immune system, consequent on HIV infection, challenges the ingenuity and resourcefulness of virologist, bacteriologist, mycologist and parasitologist alike. The virological, serological and epidemiological aspects of the infection are covered in the first articles as well as a discussion of the potential economic impact of the disease. Many students and qualified doctors are at present on the start of a learning curve in terms of the management of HIV infected people. These skills will soon be essential to effective medical practice in South Africa. Diagnostic tests appropriate for opportunistic infections, clinical care in adults and children, as well as the specific viruses of HIV and pregnancy, HIV and TB and aspects of counselling are covered in this issue. There is also an article detailing the classification and diagnosis of AIDS as well as one giving practical preventative information. Finally there is a thoughtful article on the political and socio-economic scenario that encourages the spread of AIDS. The plea is made that AIDS not be seen simply as a threat to society, but rather as an opportunity to reduce the forces in the future that are currently fuelling this epidemic amongst social outcasts, the poor and the oppressed. Perhaps, too, the myriad of social, medical and psychological problems of the AIDS patients we will all treat, will foster greater collaboration between all health care professionals to the betterment of the quality of care for all our patients.

Prof. Keith Klugman  
Dept of Medical Microbiology  
University of the Witwatersrand and SAIMR

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Virological features of HIV in the pathogenesis of AIDS

AIDS is a unique disease of man in a number of respects, not least of which is the uniqueness of the causative virus, HIV. Because of the eccentric activities of scientists such as Duesberg who have sown confusion by questioning whether AIDS is really due to HIV, it needs to be stated from the outset as unambiguously as possible that AIDS is unquestionably a venereal viral infection due to HIV (which can also be spread by blood because of its lifetime persistence in the bloodstream). What is, however, strikingly unusual, is that HIV at first glance appears to be a puny opponent - delicate, inefficient in its transmissibility, requiring a relatively large dose to establish infection, restricted in its available portals of entry into the body, and of quite low virulence in its cell killing ability. Nevertheless, once it has established infection, the powerful immune system of the body - a system well able to effectively cope with far more virulent invaders - appears to be impotent to stop the inexorable march of the virus to a fatal outcome.

Essentially there are five basic properties of the virus and the virus-host interaction which are fundamental to the understanding of how this fragile virus can cause such a devastating disease. These are: the specific tropism of the virus for the CD4 receptor protein, its hypervariability, its extraordinarily complex regulatory mechanisms, its ability to powerfully amplify the killing of cells and, lastly, its exceptional ability to evade the immune response of its host.

**CD4 protein - the major receptor site for HIV**

In-vitro HIV has been shown to infect a number of cells lacking CD4 protein. However, the precise role in nature of these alternate routes into cells remains to be established. Undoubtedly the major receptor of the virus is CD4 protein to which the third variable segment of gp120 envelope glycoprotein of the virus (the V3 loop) attaches.1,2 This attachment results in conformational changes in the gp120 molecule exposing cleavage sites in the V3 loop which causes proteolytic cleavage of this loop to expose the underlying gp41 fusion glycoprotein of the viral envelope. This then fuses with a so-called fusion protein on the host cell membrane allowing the virus to enter into the cytoplasm of the cell for replication.

This restricted tropism has put the virus at a distinct disadvantage in terms of its transmissibility as the portals of entry used by most highly contagious viruses, the respiratory tract and the gastrointestinal tract, do not have readily exposed CD4 bearing cells. The target cells for HIV are not as easily accessible, i.e. the mucous membrane of the genitalia and the bloodstream itself.

Although CD4 protein has been demonstrated on the surface of a number of cells, it is three main cells which are of importance in the pathogenesis of infection - cells of the dendritic cell lineage, especially the epithelial Langerhans cells, monocyte/macrophage cells and T-helper lymphocytes (CD4-lymphocyte).3,4 The Langerhans cell which is found in profusion in genital mucosa, is the major cell with which the virus initially makes contact. It is sensitive to infection, although resistant to the killing effect of the virus. Infection therefore readily occurs even through intact mucous membrane and it then acts as an efficient vehicle to transport virus to the lymph nodes and the immune system. The monocyte macrophage cells are also readily infected and are resistant to viral killing. They thus constitute the major reservoir of the virus in the body and transport virus throughout the body including the central nervous system. Therefore, the monocyte/macrophage cells form the major site of HIV infection in the body, as with the classical animal lentivirus infections of visna-maedi and related infections.5,6 However, HIV infects an additional cell type with dire consequences, the CD4-lymphocyte - the principal regulatory cell of the immune system. Unfortunately this cell is highly sensitive to the killing effect of the virus, possibly because of the large concentration of CD4 protein on its cell membrane (which relates directly to the cellular lethality of the virus). Not surprisingly, the latter stages of HIV infection are characterized by a profound depletion of CD4 lymphocytes and a consequent precipitous decline in immune function.

The Langerhans cell therefore initiates the infection, the monocyte/macrophage cells are the major reservoir of the virus in the body and the CD4-lymphocyte an unfortunate supplementary cell infected by HIV which is responsible for the devastating collapse of the immune system.

**The Hypervariability of HIV**

Viruses which have RNA genomes tend to be highly variable because of the lack of a repair mechanism. The retroviruses are particularly variable because the unique viral enzyme, reverse transcriptase, is particularly
prone to make errors in replication. HIV thus displays great variability of its genome manifesting in extensive variation of many of its properties. Antigenic variability (antigenic drift) confers on the virus the very valuable ability to continually evade the host’s immune response (see below), as seen with the influenza virus. There is also considerable variability in many of the virus’ biological properties, for example, strains which have a tendency to infect monocytes/macrophages are referred to as monocytotropic and those tending to infect lymphocytes as lymphocytotropic. Other variations affect growth rate and virulence. Thus there are slow/low (replicate slowly in cells with low yields of virus) and rapid/high (replicate rapidly with high yields). The latter are further subdivided into high replicating/non-syncytial and high replicating/syncytial viruses - the ability to induce syncytia (giant cells) correlates with greater virulence. Associated with these growth rate variations are tropisms for different organs, for example, neurotropic variants tend to have lower virulence than variants found in the blood. Thus an infected individual may harbour a population of various virus variants which are biologically so different from each other that they are termed quasi-species.3

The Extraordinarily Complex Regulatory Mechanism

The genome of HIV, which codes for the structural proteins of the virus, is a very simple one consisting of three genes: gag (coding for the internal proteins), pol (coding for the enzymes) and env (coding for envelope glycoproteins gp120 and gp41). However, the virus genome responsible for regulatory functions is of extraordinary complexity, seemingly out of all proportion to such a simple structural genome.7 There are at least seven regulatory genes which have been identified so far, as well as the LTR (long terminal repeat) on either side of the genome which also regulate gene expression. Four of these genes have a positive regulatory function, i.e. they stimulate expression of the three structural genes. These are the tat, rev, vif and vpu genes (in the case of HIV-1). There is a single negative regulatory gene called nef, which inhibits structural gene expression and may be responsible for latency, and an additional two genes of as yet unknown function, vpr and vpt.

This complex regulatory mechanism with positive and negative controls of gene expression furnishes the virus with a powerful adaptive ability to respond to hostile host defences by, for example, suppressing its replication to survive in a temporary phase of low replication or dormancy. It also enables the virus to respond to regulatory signals, for example, for activation coming from the host cell, or alternately it may itself influence the genetic regulation of its host cell or surrounding cells and may thereby promote tumour formation, such as with Kaposi’s sarcoma.4

Ability to Amplify Cell Killing

One of the earliest of the extraordinary observations of the properties of HIV was the ability of the virus to cause a dramatic depletion of CD4+ lymphocytes, even though the virus itself could be demonstrated to have infected only some one in a thousand or even fewer cells. However, with more advanced diagnostic techniques, especially PCR, it has now been shown that this ratio is, in fact, very much lower - perhaps only one in ten. Nevertheless, an amplification mechanism appears to be present whereby “bystander” non-infected cells are also killed beyond those directly infected. Thus, the resultant pathogenic effects of infection are out of proportion to the virulence of the virus itself.3 Postulated mechanisms for this amplification have included auto-immunity and a process called apoptosis.9 The latter was first described in relation to the physiological mechanism by which the thymus is able to rid the body of unwanted clones of lymphocytes and is essentially a form of programmed cell death.5

Ability to Evade the Host’s Immune Response

An important feature of the natural history of HIV is the apparent ability of the virus to cause progressively extensive infection and disease in the face of a seemingly potent immune response. A number of its properties may facilitate this. For example, genomic variability translating into antigenic variability may result in escape mutants not affected by specific neutralizing antibodies. Indeed, non-neutralizing antibodies attaching to the virus may enhance infection by acting as a means of conveying the virus into monocytes via their Fc receptors. In addition, the surface of the virus is covered by a carbohydrate-rich coating which protects it from the immune response. Finally, the ability of the virus to undergo a phase of low replication, or near dormancy, allows it to escape immune detection.

A Hypothesis of the Pathogenesis of HIV

Taking all these viral and host factors into account, one could construct a scenario which would explain the apparent contradictions of how such a puny virus causes such a devastating disease.

To initially establish infection a spectrum of quasi-species is required containing both low/slow and rapid/high variants. This may explain why a relatively high dose of virus is needed to establish infection. The rapidly replicating lymphotropic variants cause the characteristic suppression of CD4+ lymphocytes seen in the early stages of infection. However, these variants also stimulate a vigorous immune response which eliminates this variant, leaving behind the slowly replicating monocytophagotropic variants to continue the infection. These latter variants then progressively increase in the major reservoir of the body, that is, the monocytes/macrophages, without causing much damage (not being generally lethal to their host cells) and also providing shelter for the virus from the host’s immune response.

The monocytes/macrophages are also able to disseminate the virus to various parts of the body, including the central nervous system. In time, however, as the viral mass increases mutants arise with variants of a more virulent nature. In addition, the complex regulatory mechanism will be sensitive to internal signals as well as having an antenna out for outside
Serological diagnosis of HIV infection

Contrary to popular understanding, there is no such thing as a test for AIDS. What many mistakenly refer to as "the AIDS test" is in fact a test to determine whether or not an individual has been infected by Human Immunodeficiency Virus (HIV). Once infected by HIV the individual may then gradually develop an Acquired Immune Deficiency Syndrome (AIDS), approximately 50% of infected persons taking 10-20 years to reach this stage. The erroneous use of the term "AIDS test" or describing someone as "testing positive for AIDS" therefore creates a serious misinterpretation of that person's health status and may produce adverse psychological and sociological effects. However, it is important that persons found to be HIV-positive are informed during post-test counselling that this means that they are now latently infected with the virus, may therefore develop AIDS at some future date, and must henceforth consider themselves to be potentially infectious to others via blood, sexual contact or, in the case of women of child-bearing age, by birth.

Table 1: Types of HIV tests

<table>
<thead>
<tr>
<th>Detection of anti-HIV antibodies:</th>
<th>Screening tests:</th>
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<tbody>
<tr>
<td></td>
<td>Immunodot assays</td>
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<tr>
<td></td>
<td>Particle agglutination</td>
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<tr>
<td></td>
<td>Enzyme-linked immunosorbent assay (ELISA)</td>
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<tr>
<td>Supplementary tests:</td>
<td>Indirect Immunofluorescence (IFA)</td>
</tr>
<tr>
<td>Western Blot</td>
<td></td>
</tr>
<tr>
<td>Detection of the virus itself:</td>
<td>ELISA test for p24 core antigen</td>
</tr>
<tr>
<td></td>
<td>Virus growth in lymphocyte culture</td>
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<tr>
<td></td>
<td>Detection of proviral DNA in infected cells</td>
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</tbody>
</table>

Types of HIV tests

There are a number of ways in which to determine HIV infection, divided into methods which detect anti-HIV antibodies and methods which detect the virus itself. (Table 1).

HIV antibody tests may in turn be divided into screening tests, which should be of very high sensitivity in order to exclude false negative results, and supplementary tests, which should be of very high specificity in order to exclude false positive results. Screening tests, likewise, can be di-
vided into simple, rapid tests such as immunodot or particle agglutination assays which are suitable for use where only small numbers of specimens require testing, and more complex tests such as enzyme-linked-immunosorbent assays (ELISA or EIA) which require sophisticated equipment and can be used for batch testing.

The most widely used screening test is the ELISA which first became generally available in early 1985 and is the method most suited to the automated processing of large numbers of specimens (e.g. in blood banks). The tests in current use in South Africa detect antibodies to both HIV-1, the primary cause of the global pandemic, and HIV-2 which is still found mainly on the African continent with few cases being recorded to date in South Africa. The reported sensitivities of these test are all 100%. In the ELISA test disrupted virus particles (HIV lysates) or selected HIV proteins produced by either recombinant DNA technology or chemical synthesis are used to coat the surfaces of either beads or small wells in plastic microtitre plates. Serum from the blood specimen is added and if antibodies to HIV are present they will attach to the viral proteins, all unbound antibodies being removed by thorough washing procedures. The detection system consists of animal antibodies to human antibody. These animal antibodies, which have been conjugated to an enzyme, will attach to any human antibodies held on the bead or well. The dye substrate of the enzyme is then added and the resulting colour change, which is read spectrophotometrically, is in proportion to the amount of human anti-HIV antibody present in the original blood specimen. Most ELISA kits detect human IgG antibodies to HIV but new 3rd generation ELISA’s also detect IgM antibodies to HIV, thus giving identification of HIV infection during the early primary immune response.

In the particle agglutination assays the HIV proteins are bound to a solid substrate such as gelatine particles or minute latex beads which are cross-linked when specific antibodies to HIV are present, producing visible clumping of the particles in a positive test. Immunodot assays work on the ELISA principles but the HIV proteins are spotted onto membrane discs or onto strips or combs of nitrocellulose or plastic with the eventual colour-change reactions showing up as a dot or line. These tests are simple and rapid in that they require no instrumentation and in some cases can be performed in less than ten minutes. They are suitable for use where smaller numbers of specimens are involved, with costs varying from less than to twice the cost of ELISA.

The above methods, although highly sensitive and specific, are not completely free from false reactions. Therefore, all sera which are found “antibody reactive” in a screening test are confirmed as positive by a supplementary, more specific assay. Currently, the most commonly used supplementary tests are indirect immunofluorescence (IFA) and Western blot, both of which are technically demanding and relatively expensive.

In the IFA, cells infected with HIV are spotted onto slides, human serum is added, and specific HIV antibody is detected by the addition of anti-human antibody which has been conjugated to a dye which fluoresces when the slide is examined in a microscope using ultra-violet light. This method is time-consuming and labour intensive and interpretation of low positive results is difficult.

The most specific and informative method, and most expensive, is Western Blot. Following their electrophoretic separation in agarose gel, HIV proteins are blotted onto nitrocellulose sheets which are cut into the narrow strips used to perform the test. Again, the basic principle is similar to ELISA with the colour-change reaction showing up as dark bands across the strip. Strict criteria for the interpretation of Western blot results have been laid down by the World Health Organisation (WHO) and the USA Centers for Disease Control (CDC).

Blots are considered positive when bands indicating the presence of antibodies to both HIV core and envelope proteins are present. The SAIMR uses the CDC criteria which require the presence of any two of p24 (core protein), gp41 (inner viral membrane glycoprotein), gp120/160 (outer viral membrane/precursor glycoprotein). Strips with no bands are considered to be negative, and any band pattern not meeting the positive criteria is reported

### Table 2: Testing strategy recommendations

<table>
<thead>
<tr>
<th>Transfusion/donation safety:</th>
<th>one ELISA or rapid/simple assay positive samples discarded positive donors referred for diagnosis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Surveillance:</td>
<td>A. HIV prevalence &gt; 10% - one ELISA or rapid/simple assay</td>
</tr>
<tr>
<td></td>
<td>B. HIV prevalence &lt; 10% - one highly sensitive ELISA or rapid/simple assay followed by a highly specific ELISA or rapid/simple assay</td>
</tr>
<tr>
<td>Diagnosis:</td>
<td>C. persons with clinical signs/symptoms - all prevalences two tests as in B above doubtful or discrepant results referred to reference laboratory</td>
</tr>
<tr>
<td></td>
<td>D. asymptomatic persons - HIV prevalence &gt; 10% - as in C above</td>
</tr>
<tr>
<td></td>
<td>- HIV prevalence &lt; 10% - as in B plus a third and different test</td>
</tr>
</tbody>
</table>
Serology

as indeterminate with a request for follow-up specimens. Those persons for whom no change from an indeterminate band pattern is found after a period of six months may then also be reported as HIV-negative. The Western blot may also yield information useful to the clinician as the band patterns change from that seen following early seroconversion after infection, to that of full HIV antibody development and finally to that of the patient with HIV-associated disease or terminal AIDS.

Other approaches to the diagnosis of HIV infection are directed towards detection of the virus itself. These include the detection of HIV p24 core antigen by an adjusted ELISA procedure, culture of the virus from patient specimens, the recognition of HIV gene sequences in human cells using specific nucleic acid probes, and the polymerase chain reaction (PCR) which is a method of gene amplification whereby minuscule amounts of HIV genetic material are multiplied to the level at which they can be detected by specific probe hybridisation. However, virus culture and PCR are carried out only in specialised centres with expensive containment facilities and highly trained staff.

The ELISA test for HIV p24 core antigen when positive is indicative of the presence of virus particles in the specimen. However, although it has been reported to be highly sensitive in detecting the presence of viral antigen in the supernatant medium of HIV cell cultures, it is less sensitive when used to test samples of human serum due to the low concentration of HIV particles normally found in the blood. Therefore, while a positive HIV antigen test result on a blood specimen can be diagnostic, a negative result does not necessarily mean that the specimen is virus free.

A real need exists for diagnosis by viral detection, particularly in the case of infants born to HIV infected mothers. As all infants are born with a goodly supply of maternal antibodies the currently available tests for HIV antibody, which do not distinguish between maternal and infant’s antibodies, do not help to determine which infants are truly infected with the virus. Unless the infant first develops signs or symptoms related to HIV infection one must wait up to eighteen months for a firm diagnosis based on the presence of antibodies to HIV. The availability of a test specifically for HIV IgM antibodies, which do not cross the placenta and hence are diagnostic of an immune response to infection by the infant itself, is badly needed in Africa, including Southern Africa, where the expanding epidemic in the heterosexual population is now leading to the appearance of increasing numbers of infants with HIV infection or AIDS.

Objectives and strategies of HIV testing

The conventional strategy of HIV antibody testing to date has been the use of a highly specific confirmatory test (Western blot). Western blot is expensive, time consuming and requires sophisticated equipment and, as the number of positives detected by a screening test constantly increases, constitutes an ever-expanding unaffordable cost to health services in third world countries. However most 2nd and 3rd generation screening tests are 100% sensitive and 95-100% specific. Therefore, if two differently based screening assays are used, 100% sensitivity and specificity may be obtained at a greatly reduced cost.

Test selection is obviously critical to this approach and the exact strategy employed will depend upon the particular objective of HIV antibody testing. The WHO Global Programme on AIDS has issued recommendations in this respect.

Test strategy will depend on:

- the objective of the test;
- the sensitivity and specificity of the test(s) used; and
- the prevalence of HIV infection in the population being tested.

Four main objectives have been identified:

Transfusion/donation safety

Screening of blood and blood products, and of serum from donors of tissues, organs, sperm or ova.

Surveillance

Unlinked anonymous testing of serum for the purpose of monitoring the prevalence of, and trends in, HIV infection over time in a given population.

Diagnosis of HIV infection

Voluntary testing of serum from asymptomatic persons, persons with clinical signs and symptoms suggestive of HIV infection or AIDS, and persons whose HIV antibody status may be required for insurance, travel, immigration or employment purposes.

Research

Voluntary testing of serum from subjects of epidemiological, clinical, virological or other HIV-related studies.

Finally, it should be said that in view of the wide range of personal, social and financial implications of a positive diagnosis of HIV infection, a test to determine HIV infection in an individual should be performed only after pre-test counselling has been given and consent to the test obtained. In addition, for those newly diagnosed HIV-positive on the first sample, a second blood sample should be obtained and tested in order to help eliminate any possible laboratory or clerical error.
Prevalence of HIV Infection Amongst Patients at Baragwanath Hospital

Introduction

As the referral hospital for a large urban population, Baragwanath Hospital is an important surveillance site to monitor the emergence of the HIV epidemic in Southern Africa. The prevalence of HIV infection amongst patients in the hospital can be used as a guide to clinical decisions on the likelihood that patients may be infected by opportunistic pathogens; these data are necessary to plan counselling services, as well as patient follow-up services in the form of clinics at the hospital and in the community; these data can also be used as part of a national surveillance network.

Methods

It is a mandatory requirement of clinical practice at Baragwanath Hospital that all blood specimens taken for diagnosis of HIV infection are taken following informed consent. Blood is currently tested using the Abbott recombinant HIV-1/HIV 2, 3rd generation ELISA assay (Abbott Gmbh Diagnostika, Wiesbaden, Germany), which is repeated on positive specimens and then confirmed with Western blot using viral lysate as the antigen (HIV Viral Lysate, Organon Teknika, Durham, North Carolina, USA). Western blots are performed by the department of serology, SAIMR. Some clinical specimens are tested by a rapid method (Testpack, Abbott Laboratories, Weisbaden, Germany). Positive results on the rapid test are always confirmed on ELISA and then Western Blot. A duplicate specimen is always requested on confirmed positive cases. All specimens received for HIV testing from January 1992 to June 1992 are included in this analysis.

Results

During the first six months of 1992, we identified 737 infected individuals from 25 393 sera submitted for diagnostic testing. Thus, in this hospital population, 2.9% of sera are positive for HIV 1/2 antibodies as defined above. The prevalence of HIV infection as detected in the medical, surgical, gynaecological, and paediatric wards is presented in Table 1. Also shown in Table 1 is the prevalence of HIV infection amongst clinic attenders in Soweto, from whom HIV testing is only done on clinical suspicion of AIDS or HIV-related illness. The final category presented in Table 1 is the seroprevalence in women attending ante-natal clinics (ANC) or presenting unbooked to deliver a baby at the hospital.

Discussion

Almost 3% of specimens sent to the Baragwanath Hospital Microbiology Laboratory for HIV testing during the period under review were confirmed to contain antibodies to HIV virus. The range of seroprevalence was 1.7% to 9.2% depending on the patient population studied. The prevalence of 1.8% in the gynaecological wards and 1.7% in the surgical wards probably reflects the seroprevalence of the populations likely to be admitted to those wards. The overwhelming majority of specimens are collected prior to surgery on these patients and very few specimens are taken at this time on the basis of clinical suspicion of AIDS. The higher seroprevalence of 3.3% in antenatal clinic attenders compared to 1.8% in the gynaecological wards is presented in Table 1. Also shown in Table 1 is the prevalence of HIV infection amongst clinic attenders in Soweto, from whom HIV testing is only done on clinical suspicion of AIDS or HIV-related illness. The final category presented in Table 1 is the seroprevalence in women attending ante-natal clinics (ANC) or presenting unbooked to deliver a baby at the hospital.

Table 1: Seroprevalence of HIV infection January - June 1992 at Baragwanath Hospital

<table>
<thead>
<tr>
<th>Category</th>
<th>No. tested</th>
<th>No. positive</th>
<th>% positive</th>
</tr>
</thead>
<tbody>
<tr>
<td>All specimens*</td>
<td>25 393</td>
<td>737</td>
<td>2.9</td>
</tr>
<tr>
<td>Medical wards</td>
<td>6 632</td>
<td>250</td>
<td>3.7</td>
</tr>
<tr>
<td>Surgical wards</td>
<td>7 039</td>
<td>121</td>
<td>1.7</td>
</tr>
<tr>
<td>Gynaecological wards</td>
<td>2 512</td>
<td>45</td>
<td>1.8</td>
</tr>
<tr>
<td>Paediatric wards</td>
<td>1 343</td>
<td>55</td>
<td>4.1</td>
</tr>
<tr>
<td>Peripheral clinics**</td>
<td>563</td>
<td>52</td>
<td>9.2</td>
</tr>
<tr>
<td>Ante-natal clinics</td>
<td>4 562</td>
<td>153</td>
<td>3.3</td>
</tr>
</tbody>
</table>

* Includes specimens received from specialist units and clinics.
** Testing only performed on suspicion of HIV-related illness.
ological wards probably reflects the increased seroprevalence of HIV infection in young women in obstetric wards compared to the, on average, more elderly population in the gynaecological wards. Previous surveys of the antenatal population at this hospital reveal the extent of the progression of the epidemic amongst urban women over the past 2 years. In a survey conducted between December 1989-February 1990, only 0.26% of women were serologically positive for HIV infection, while follow-up data one year ago revealed a seroprevalence of 1.07% in this population. As the current seroprevalence is 3.3%, these data suggest a doubling time of the rate of infection in this population of less than one year and we would thus anticipate a seroprevalence in excess of 5% during 1993.

As approximately 50% of these women give birth to infected babies, we can extrapolate that 1.6% of babies born at the hospital are infected, and as these babies are at greatly increased risk of paediatric infections, it is not surprising that the seroprevalence in the paediatric wards is already 4.1%. The emerging HIV epidemic represents the greatest challenge to the present generation of medical practitioners. We may be judged as laboratory workers, administrators, clinicians and care-givers by our response to this challenge.

REFERENCES

Demographic and Economic Implications of AIDS in South Africa

The potential impact of HIV/AIDS on a country's economy has emerged as one of the most important concerns of the epidemic. At the level of the health sector, this concern reflects the substantial amount of additional resources that are required to provide adequate care for people with HIV/AIDS. However, part of this concern reflects the fact that HIV/AIDS has an economic burden beyond the value of those resources diverted to the health sector to care for patients. HIV/AIDS affects relatively young and economically active members of society disproportionately and thus has enormous costs in terms of loss of potential output.

This paper considers the potential impact of HIV/AIDS on South Africa's population and its economy. The first part describes the demographic impact of HIV/AIDS on the adult population aged 15-49. In the second part we present estimates of the health sector costs of HIV/AIDS, as well as the costs in lost productivity that will result from illness and premature death associated with HIV/AIDS. We conclude with some observations that should inform our actions as we respond to the epidemic.

Demographic implications

The "Doyle Model" represents seminal work in the area of modelling the demographic impacts of HIV/AIDS, and has gained wide local and international recognition as being an eminently sound and reasonable one. Figure 1 shows two scenarios developed in the "Doyle Model". The first scenario shows that if there is no change in sexual behaviour, the HIV prevalence among adults will reach a plateau in about 2010. At that stage 27% of the adult population will be infected. Evidence from around the world suggests, however, that some change in sexual behaviour occurs once a significant number of people begin to die from AIDS. If this expected change in behaviour occurs the epidemic will reach a peak in 2005, with 18% of the adult population infected.

Figure 2 shows the number of adults who are likely to get sick with AIDS. In the more optimistic scenario, almost 200 000 people will be sick with AIDS and other AIDS related illnesses by 2000. This number rises to 500 000 by 2005. The projected total deaths in the population, including people dying from AIDS is shown in Figure 3. The base trajectory shows normal deaths in the population without AIDS. The projections of the two scenarios clearly show the increasing impact of AIDS from 1995. By 2005 2.9 million people are likely to have died from AIDS if no significant behavioural changes occur. In the event of people changing sexual behaviour, the cumulative total deaths will be lower.

The crucial demographic implication of the model is that though the human costs of the epidemic are enormous, at no stage does the epidemic result in a negative population growth rate. If there is no change in sexual behaviour, then the population growth rate will be reduced to 1.2% by 2010. With the expected change in sexual behaviour the population would continue to grow at about 1.7% per year. A realistic estimate is that in 2005 the population will be approximately 50% greater than the 1985 figure (53 million in 2005 compared...
Demographics

THE LEECH 1992: 61(3)

Figure 2: AIDS sick: Adults aged 15-49

Your no change in sexual behaviour
- change in sexual behaviour

Figure 3: Total deaths (all ages)

to 32 million in 1985).

Economic implications

The measurable economic consequences of HIV/AIDS are usually categorised as direct and indirect costs. Direct costs are those involved in all aspects of prevention of the disease, treatment and counselling of patients. Direct costs reflect the magnitude of the resources diverted from other sectors of the economy to the health sector to care for people with HIV/AIDS. Indirect costs on the other hand, reflect the value of lost production as a result of morbidity, disability and premature mortality associated with HIV/AIDS.

A wide range of other potentially measurable costs should theoretically be included in an estimation of the total economic burden imposed by HIV/AIDS. These include important economic consequences borne by HIV positive individuals and their families, such as job losses, discrimination in employment, inability to obtain insurance coverage, and withdrawal from jobs by informal carers of persons with AIDS. In addition, there are intangible costs of the disease, such as the psychological effects of pain and suffering.

In practice, the difficulty of accurately measuring these costs means that they are almost universally omitted. Most studies have in fact focused on a fairly narrow range of direct costs of HIV/AIDS, while a few have sought to assess indirect costs.

Measuring indirect costs

Our model estimates indirect costs by attaching average earnings to productive life years lost due to HIV/AIDS. Thus, morbidity costs measure the potential wages foregone as a result of disability and morbidity, while mortality costs reflects the value of future income lost as a result of premature death. These lost earnings are then discounted at a rate of 4% to convert future earnings into their present value.

Table 1 shows that productivity losses increase from R296 million in 1991 to R9.3 billion in 2000. The impact on the economy is quite small however, and ranges between 0.36% - 1.28% of GNP in 2000. These losses may well be sustainable, especially if GNP growth rate picks up in the post apartheid era.

Measuring direct costs

A complete assessment of direct costs should cover both personal and non-personal costs of managing patients at all stages of the disease. In practice, however, difficulties of data collection have meant that a vast majority of studies have focused on the costs of full blown AIDS, and have excluded the costs of the pre-AIDS phases. This omission is particularly serious in developing countries where symptomatic TB causes significant morbidity and mortality in the pre-AIDS phase of the illness; omission of these costs thus seriously underestimates the overall economic burden of the disease in these countries.

Ideally, relevant data should be collected by prospectively studying the utilisation patterns and subsequent costs of a randomly selected group of patients. However, the extreme difficulties of both random selection and prospective follow up in HIV/AIDS have meant that, without exception, all studies have relied on retrospective analysis of a convenience sample, such as a group of AIDS patients treated at a particular hospital. The usual source of data in retrospective utilisation analyses are
Table 1: Total costs of HIV/AIDS (1991 Rand - Rounded millions)

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Indirect</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Direct*</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low</td>
<td>74</td>
<td>685</td>
<td>4,713</td>
</tr>
<tr>
<td>High</td>
<td>112</td>
<td>1259</td>
<td>10,007</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low</td>
<td>370</td>
<td>2,700</td>
<td>14,058</td>
</tr>
<tr>
<td>High</td>
<td>408</td>
<td>3,273</td>
<td>19,352</td>
</tr>
</tbody>
</table>

* Direct costs were calculated on assumptions of low and high hospital costs.

Figure 4: Total direct costs of HIV/AIDS vs. total health expenditure

patient records, either from a particular institution, or from the insurance company paying for that patient's care. An important problem with this approach is that these records might not reflect all costs incurred, since patients may receive care from a number of institutions.

Since there is as yet very little retrospective data on utilization of health services by AIDS patients in South Africa, our model estimates direct costs through a realistic assessment of the likely utilization of health care resources. We calculate the costs of treating patients with HIV-associated tuberculosis, pre-AIDS complications and AIDS.

Table 1 also shows that the costs of HIV/AIDS to the health service increase from R94 million in 1991 to approximately R7.4 billion in 2000 (mean of low and high figures). Direct costs increase so much because the number of persons with HIV/AIDS rises dramatically over these years. Hospitalization of patients during the active AIDS stage is by far the major contributor to cost.

Direct costs vs total health expenditure

One useful way to judge the impact of the epidemic on the health services is to project the proportion of total health expenditure that will go to the care of patients.

Figure 4 shows that the proportion going to AIDS care begins to increase rapidly after 1994, and reaches a peak of 19% - 40% of all health expenditure by 2000. By 2005 expenditure on HIV/AIDS care could reach 34-75% of South Africa's total health expenditure.

These figures are quite alarming. Even if one takes the median figures of 34% and 54% of total health expenditure, HIV/AIDS care could still consume a substantial proportion of health expenditure, leaving us with only half of the total health budget to do all the things we are currently doing.

Even in a well endowed health care system, this order of expenditure would have a drastic impact on the health services. In the light of the current shortage of resources for health care in South Africa, and the likelihood that this shortage will become worse due to competing social spending demands, this expenditure will be unsustainable. Thus there is likely to be substantial reallocations within the health budget, away from primary health care and towards the care of people sick with AIDS.

It is crucial therefore that policy measures be developed urgently to prevent the "crowding out" of non-AIDS patients from the health care system, something which is already commonplace in several African countries. Policy interventions should attempt to mitigate the negative impact on health services while ensuring adequate care; encourage appropriate treatment settings for persons with AIDS; and encourage the treatment of other sexually transmitted diseases as the most optimal way of reducing the number of AIDS cases.

Conclusion

This paper has presented estimates of the demographic and economic impact of HIV/AIDS in South Africa, and has attempted to communicate some fundamental messages which should inform our actions as we attempt to respond to HIV/AIDS.

The first message is that the impact of HIV/AIDS on the health services will be profound, and may well be devastating. These effects will only be mitigated if policy decisions that will protect the health services and ensure adequate care are taken soon, and if action based on these decisions is undertaken as a priority.

The second is that though the indirect costs of AIDS will be sustainable over the next 15 years, they may become a major obstacle to development after 2005 if the epidemic follows the predicted worst case scenario.

The last, and probably the most important message is that the HIV/
AIDS epidemic will be a desperately serious human tragedy. South Africa is on the brink of a vast burden of potentially avoidable illness and death associated with HIV/AIDS. The consequences for our economy and health service will be enormous. For individuals, their families and communities the consequences may well be devastating. If the experience of other African countries is any indication, the burden on families who have to care for those people who cannot get access to the health service will be enormous. Such burden will, unfortunately, fall disproportionately on women, and will be exacerbated by inadequate social support systems.

These observations demand that we urgently develop policies to respond to the unique range of issues that HIV/AIDS presents. It is already too late to stop the death of thousands who are now carrying the HIV virus. It is not too late, however, to prevent further millions from dying. It is not too late to mitigate the impact that HIV/AIDS will have on our health services, and on our society as a whole. The responsibility lies with all relevant stage agencies as well as with a range of NGO's, including trade unions and employers. The responsibility lies with everyone of us. Whether or not we succeed will depend on the actions we take now and in the immediate future.

REFERENCES

THE UNIQUE H.I.V. PROTECTION INVESTMENT PLAN

The advent of H.I.V. infection in the 1980’s has heralded a new approach to social interactions and usual Medical, Dental and Nursing services. The implications of H.I.V. infection ranges from personal tragedy and misery to national and international economic catastrophe.

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3. Contribution rates are guaranteed.
4. Cover may escalate.
5. Guaranteed life cover.
6. Payment effected immediately upon diagnosis.
7. Cover irrespective of source of infection.
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9. This product is exclusive to the Financial Workshop (Pty) Ltd.

The above detailing clearly illustrates that the “H.I.V. Protection Investment Plan” is indeed unique. This product provides greatly needed financial security for the high risk worker as well as simultaneously providing a long term investment.

For further information contact Brenda Soicher
Tel: (011) 884-7690 (o/h), (011) 440-2520 (a/h).
Investigating the symptomatic HIV-positive patient for an infectious disease

Part 1: Oral and cutaneous infections

Introduction

General constitutional symptoms in a patient known to harbour HIV should prompt the clinician to make a thorough clinical assessment of the patient. Whilst symptoms may point to a specific site, it is important to remember that many opportunistic infections may affect multiple sites. In addition, it must be remembered that tumours may also be the cause of the symptoms.

General investigations which may be undertaken are shown in Table 1.

Investigating oral infections

Oral candidiasis
This may affect the hard and/or soft palate, buccal mucosa, pharynx and hypopharynx.

The incidence of oral candidiasis increases as the CD4+ count decreases. Clinically:

- pseudomembranous candidiasis with "cottage cheese" plaques;
- flat erythematous lesions;
- hyperkeratotic lesions (Candidal leucoplakia);
- angular cheilitis.

Diagnosis

- Specimen: scraped material or a mucosal smear from a plaque for KOH preparation.
- Culture provides information on the species involved.
- Biopsy distinguishes between various forms of leucoplakia.
- Response to antifungal therapy.

Hairy leucoplakia
This produces white thickenings of the oral mucosa mainly on the edges of the tongue, often with corruga-

Table 1:

<table>
<thead>
<tr>
<th>Full clinical history and examination</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>General</strong></td>
</tr>
<tr>
<td>Full blood count and platelets</td>
</tr>
<tr>
<td>Urea and electrolytes, creatinine, LFT's</td>
</tr>
<tr>
<td>Blood glucose</td>
</tr>
<tr>
<td>Chest X-ray</td>
</tr>
<tr>
<td>Arterial blood gases</td>
</tr>
<tr>
<td><strong>Infection screen</strong></td>
</tr>
<tr>
<td>Blood cultures</td>
</tr>
<tr>
<td>Sputa:</td>
</tr>
<tr>
<td>MC&amp;S for general bacteria</td>
</tr>
<tr>
<td>MC&amp;S for Mycobacteria spp</td>
</tr>
<tr>
<td>stains for pneumocystis</td>
</tr>
<tr>
<td>Urine:</td>
</tr>
<tr>
<td>MC&amp;S for general bacteria</td>
</tr>
<tr>
<td>MC&amp;S for Mycobacteria spp</td>
</tr>
<tr>
<td>virus culture (incl. CMV)</td>
</tr>
<tr>
<td>Throat swab:</td>
</tr>
<tr>
<td>MC&amp;S for bacteria</td>
</tr>
<tr>
<td>Stool:</td>
</tr>
<tr>
<td>cytes, parasites, ova</td>
</tr>
<tr>
<td>MC&amp;S for general bacteria</td>
</tr>
<tr>
<td>MC&amp;S for Mycobacteria spp</td>
</tr>
<tr>
<td>biochemistry</td>
</tr>
<tr>
<td>MC&amp;S</td>
</tr>
<tr>
<td>cryptococcal India ink stain</td>
</tr>
<tr>
<td>cryptococcal antigen detection</td>
</tr>
<tr>
<td><strong>Where indicated</strong></td>
</tr>
<tr>
<td>CT scan</td>
</tr>
<tr>
<td>Bone marrow trephine</td>
</tr>
<tr>
<td>Bone marrow aspirate</td>
</tr>
<tr>
<td>Lymph node biopsy</td>
</tr>
<tr>
<td>Liver biopsy</td>
</tr>
<tr>
<td>Bronchoscopy</td>
</tr>
</tbody>
</table>

Dr Ute Jentsch  
MBBCh  
Registrar, Department of Medical Microbiology, WITS  
Prof KP Klugman  
Head, Department of Medical Microbiology

It appears assymptomatically when immunosuppression has progressed to an advanced stage.

The aetiology is unclear (?EBV).

Diagnosis

- Macroscopic appearance.
- Failure of the lesions to scrape off with a tongue blade.
- Failure to respond to antifungal therapy.
- Biopsy: typical histological appearance.

Herpes Simplex
Orallab HSV infection may be caused either by HSV-1 or HSV-2. HSV-2 typically causes outbreaks in
the buttocks, perineum, scrotum/vulva, glans and shaft of the penis. It can also cause a severe herpes proctitis.

**Diagnosis**
- Specimen: scrapings of the lesions, aspirated fluid from a blister, mucosal swab. The specimen must be placed in viral transport medium if direct processing of the specimen is not possible and be kept refrigerated at 4°C.
- Tzanck preparation is done on a fresh specimen placed on a glass slide.
- Direct immunofluorescent technique: the specimen needs to be fixed with acetone onto a glass slide.
- Viral culture
- Serology: ELISA’s for HSV and HZV (IgM and IgG) are usually of little value in diagnosis of recurrent disease because a significant increase in antibody titre are normally only found in primary disease. It may help to differentiate between HSV and HZV.

**Herpes Zoster**
Both chickenpox and shingles may present with oral lesions and secondary bacterial infection is common.

**Diagnosis**
- Usually clinically.
- Antibody assays: ELISA.
- Direct immunofluorescent techniques and culture are not routinely done but may be requested for if it is clinically difficult to differentiate between HSV and HZV.

**HIV associated bacterial gingivitis and periodontitis**
Oral mucosal lesions associated with Klebsiella pneumoniae and Enterobacter cloacae have been diagnosed on culture. Unusual rapidly progressive forms of gingivitis and periodontitis of uncertain aetiology are seen in association with HIV disease.

**Diagnosis**
- Specimen: oral mucosal swab for bacterial MC&S.

**HPV-Warts**
Venereal transmission seems unlikely in these warts, since HPV types 7, 13 and 32 have predominantly been isolated.

**Diagnosis**
- Biopsy: histology.

**Investigating infectious cutaneous disorders**
Skin disease occurs in up to 90% of cases. Commonly two or more skin conditions are present simultaneously. In Table 2 the more frequently occurring skin infections are listed.

<table>
<thead>
<tr>
<th>Condition</th>
<th>Morphology/location</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Staphylococcal folliculitis</td>
<td>Erythematous follicular pustules and papules; may be pruritic; face, trunk and groin are frequently affected.</td>
<td>In relapsing cases check for nasal carriage of <em>Staphylococcus aureus</em>.</td>
</tr>
<tr>
<td>Bacillary angiomatosis: The causative organism is felt to be closely related to the bacterium causing cat-scratch disease</td>
<td>Friable vascular papules, cellular plaques, subcutaneous nodules.</td>
<td>Uncommon chronic infection. Difficult to culture; so diagnosis is established by histopathology. PCR has also been used. Fatal if untreated with dissemination to bone, liver, spleen and lymph nodes.</td>
</tr>
<tr>
<td>Herpes Zoster (shingles)</td>
<td>Grouped vesicles on erythematous bases. May present atypically in a non-dermatomal distribution and differentiation from HSV may be clinically difficult. Dissemination may occur.</td>
<td>Commonly occurs during the asymptomatic period of HIV disease.</td>
</tr>
<tr>
<td>Herpes Simplex</td>
<td>Vescular rash rapidly evolving into mucocutaneous ulcerations. Face, hands or anogenital areas are usually affected.</td>
<td>Any persistent non-healing ulcer in an HIV-infected person must be suspected of being HSV related. It is not unusual for the lesions to be secondarily infected.</td>
</tr>
<tr>
<td>Molluscum contagiosum</td>
<td>2-5mm pearly flesh-coloured papules often with central umbilication. Face (esp. eyelids) and ano-genital area commonly affected.</td>
<td>Common in patients with symptomatic HIV disease. Diagnosis is made histopathologically.</td>
</tr>
</tbody>
</table>

**Investigations**

**Table 2**
CONGRATULATIONS!

NOW

AFTER UMPTEEN YEARS IN MED SCHOOL, CAN YOU AFFORD A PRACTICE?

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World Health Organisation Staging System for HIV Infection and Disease

Clinical stage 1

1. Acute retroviral infection.
2. Asymptomatic.
3. Persistent generalised lymphadenopathy (enlargement of the lymph nodes).

Performance scale 1: asymptomatic, normal activity.

Clinical stage 2

4. Weight loss, <10% of body weight.
5. Minor mucocutaneous manifestations (seborrhoeic dermatitis, prurigo (chronic itchy skin), fungal nail infections, recurrent oral ulcerations, angular cheilitis (inflammation of the corners of the mouth)).
6. Herpes zoster (shingles), within the last 5 years.
7. Recurrent upper respiratory tract infections (i.e. bacterial sinusitis).

And/or performance scale 2: symptomatic, normal activity.

Clinical stage 3

8. Weight loss, >10% of body weight.
9. Unexplained chronic diarrhoea, >1 month.
10. Unexplained prolonged fever (intermittent or constant), >1 month.
12. Vulvovaginal candidiasis, chronic (>1 month) or poorly responsive to therapy.
14. Pulmonary tuberculosis, within the past year.
15. Severe bacterial infections (e.g. pneumonia).

And/or performance scale 3: bed-ridden, <50% of the day during the month.

Clinical stage 4

(AIDS - defining conditions)

16. HIV wasting syndrome, as defined.
17. Pneumocystis carinii pneumonia.
18. Toxoplasmosis of the brain.
19. Cryptosporidiosis with diarrhoea, >1 month.
20. Cryptosporidiosis, extrapulmonary.
21. Cytomegalovirus (disease of an organ other than liver, spleen or lymph nodes).
22. Herpes simplex virus infection, mucocutaneous >1 month, or visceral any duration.
23. Progressive multifocal leukoencephalopathy (selective destruction of the central nervous system).
24. Any disseminated endemic mycosis (i.e. histoplasmosis, coccidioidomycosis).
25. Candidiasis of the oesophagus, trachea, bronchi or lungs.
27. Non-typhoid salmonella septicaemia.
29. Lymphoma.
30. Kaposi’s sarcoma.
31. HIV encephalopathy, as defined.

And/or performance scale 4: bedridden, >50% of the day during the last month.
Clinical care of the HIV infected adult

The management of HIV infection involves caring for a person with a chronic progressive viral infection. Advanced disease associated with severe immune dysfunction represents only a part of the spectrum. The doctor should attempt to benefit the patient by improving his or her sense of well-being, reducing morbidity and prolonging survival; and thereby help the patient to maintain self-sufficiency and productivity for as long as possible. Education and psychosocial support are of great importance in achieving these goals.

Current medical management rests on five pillars:

- Good doctor-patient communication.
- Timely staging of disease progression.
- Prevention of opportunistic infections.
- Early recognition of complications of immune deficiency.
- Use of antiviral therapy to improve the immune deficit or to delay its progression.

The model of care presented here will need to be adapted according to disease presentation in different groups of patients, resource availability, and health infrastructure. Examples of this are the infrequency of Pneumocystis carinii pneumonia (PCP) in black patients as compared to white ones, and the fact that most patients in this country do not have access to antiviral agents such as zidovudine.

Initial evaluation (Table 1)

A complete baseline physical examination should be done. The chest x-ray is needed mainly to exclude active tuberculosis. A false-positive RPR may be seen as part of the polyclonal B-cell activation caused by HIV.

Toxoplasma serology can be postponed until illness suggestive of toxoplasmosis occurs.

Once the diagnosis of HIV infection is made, staging the patient by identifying the degree of immune system dysfunction is vital for proper counselling and medical management. T-lymphocyte subset analysis is probably the single most useful and readily interpretable measurement of immune function in HIV infected patients.

Table 1: Initial evaluation of the HIV infected person

<table>
<thead>
<tr>
<th>Routine history and physical examination</th>
<th>Complications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Baseline mental status assessment</td>
<td>Normal count</td>
</tr>
<tr>
<td>Weight</td>
<td></td>
</tr>
<tr>
<td>Urinalysis</td>
<td></td>
</tr>
<tr>
<td>Chest X-ray</td>
<td></td>
</tr>
<tr>
<td>Full blood count (FBC)</td>
<td></td>
</tr>
<tr>
<td>Syphilis serology (RPR/FTA or TPHA)</td>
<td></td>
</tr>
<tr>
<td>T-lymphocyte subsets</td>
<td></td>
</tr>
</tbody>
</table>

Table 2: CD4 count related to presentations

<table>
<thead>
<tr>
<th>CD4 counts</th>
<th>Complications</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt; 600/mm³</td>
<td>Normal count</td>
</tr>
<tr>
<td>200-500/mm³</td>
<td>Tuberculosis, Kaposi's sarcoma, thrush, and oral hairy leukoplakia</td>
</tr>
<tr>
<td>&lt;200/mm³</td>
<td>Pneumocystis carinii pneumonia, toxoplasmosis, mycobacterium avium complex, cytomegalovirus, and lymphoma.</td>
</tr>
</tbody>
</table>

Table 3: The follow-up physical examination

<table>
<thead>
<tr>
<th>General</th>
<th>Overall well-being, weight, fever, sweats</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mouth</td>
<td>Candidiasis (pseudomembranous and erythematous), hairy leukoplakia, aphthous ulcers, periodontal disease</td>
</tr>
<tr>
<td>Lymphatic</td>
<td>Localised lymphadenopathy, * splenomegaly, hepatomegaly</td>
</tr>
<tr>
<td>Skin</td>
<td>Rashes, drying, pruritus</td>
</tr>
<tr>
<td>Respiratory system</td>
<td>Cough, shortness of breath</td>
</tr>
<tr>
<td>Gastrointestinal system</td>
<td>Diarrhoea</td>
</tr>
<tr>
<td>Neurologic or Psychologic</td>
<td>Headache, mood, psychomotor slowing, fundoscopy</td>
</tr>
</tbody>
</table>

(* Generalised lymphadenopathy does not correlate with increased disease progression).
Second line markers are B2-microglobulin and p24 antigen. The former marker of immune activation has poor specificity and the latter test is expensive. These ancillary markers should be used selectively, if at all. The limitations of the CD4 (T-helper cell) count include interlaboratory variability, and intrapatient variability associated with ageing, diurnal rhythms, and intercurrent illness. Despite these drawbacks, CD4 counts provide very useful guidance and determine important landmarks in the management of AIDS patients. Specific complications of HIV infection can be roughly anticipated to occur at different levels of the CD4 count (Table 2).

Follow-up examination

Repeated routine physical examinations have proven unhelpful. However, a focused examination may uncover important new data (Table 3).

It must be emphasised that these abridged recommendations apply only when there has been no change in clinical status. The development of noteworthy symptoms necessitates a complete re-examination. Patients should be referred for significant psychiatric or social problems.

The optimal frequency of follow-up visits and laboratory assessments have yet to be determined. Table 4 contains recommendations for those for whom AZT is available. One approach for the others is to stratify according to CD4 count and clinical well-being. Asymptomatic individuals with normal CD4 counts need be seen only 6-12 monthly. Those with moderately reduced CD4 counts (200-500/mm³) can be seen 3-4 monthly. More frequent visits may be required for psychosocial support and counselling. Once patients are symptomatic or embark upon medical therapy, then such intervals must be determined on clinical grounds. Disease monitoring using the CD4 count, if it is available, can be repeated 6-12 monthly, especially if prophylaxis for PCP is to be instituted. It is pointless repeating the CD4 count once it falls below 200/mm³, except possibly in the setting of untreated tuberculosis which can depress the count.

Using the differential white cell count, a total lymphocyte count of less than 500/mm³ appears to correlate with a CD4 count of less than 200/mm³.

It is recommended that women have an annual Pap smear to exclude cervical neoplasia. Contraceptive methods should be discussed since condoms are primarily for the prevention of HIV-transmission.

Table 4: Guidelines for zidovudine treatment

<table>
<thead>
<tr>
<th>CD4 count</th>
<th>Follow-up 3-6 monthly with CD4 count</th>
<th>Repeat CD4 count after one week</th>
<th>Recommend zidovudine therapy if CD4 count &lt; 500/mm³ again</th>
<th>Start zidovudine</th>
<th>Follow-up after two weeks</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt; 500/mm³</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt; 500/mm³</td>
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</tbody>
</table>

Prophylaxis of opportunistic infections

A CD4 count of 200/mm³ is the signal to begin primary prophylaxis for PCP in those at risk. There seems to be a much higher likelihood of PCP and hence need for prophylaxis in white patients. The drug of choice is cotrimoxazole at a dose of two tablets twice daily three times per week. An alternative is dapsone 100 mg daily.

Isoniazid prophylaxis has been shown to be beneficial in preventing tuberculosis in those who are not HIV infected. Efficacy and feasibility studies are underway to determine the usefulness in asymptomatic people with dual infection (tuberculosis and HIV). It can be offered to patients with CD4 counts of 200-250/mm³ and less and should be continued for twelve months. Questions of compliance, costs, resistance, and toxicity still need to be addressed, and thus it has not achieved general acceptance in Africa.

Pneumococcal vaccine can be given to those with early disease who can be expected to mount an appropriate response. Seasonal influenza vaccine is recommended, though influenza is not more severe in these patients.

Treatment for HIV infection

The modified deoxynucleosides, which include zidovudine (Retrovir) and dideoxyinosine or ddI (Videx), are HIV reverse transcriptase inhibitors and chain terminators. They reduce the ability of HIV to spread to uninfected cells.

Zidovudine was initially shown in a placebo-controlled trial, in patients with AIDS or ARC, to increase survival, improve performance status, decrease the number of opportunistic infections, and transiently increase the number of CD4 cells.

Two double-blind placebo-controlled trials of zidovudine in asymptomatic and mildly symptomatic HIV infected people, showed
that zidovudine reduced the rate of progression to an AIDS-defining event in people with less than 500 CD4 cells/mm³. The studies did not demonstrate prolonged survival, nor did they address the question of long-term toxicity of zidovudine given to asymptomatic people.

On the basis of these data, any patient with an AIDS-defining opportunistic infection, wasting syndrome ("Slim" disease), symptomatic or asymptomatic HIV infection and a CD4 count <500/mm³ should be considered a candidate for zidovudine therapy. The results of ongoing trials will clarify the benefits for asymptomatic patients.

Table 4 provides guidelines for initiating zidovudine therapy. The rationale for therapy and the potential adverse effects should be discussed. Cost is most often the limiting factor in starting antiviral treatment.

Adverse effects of zidovudine which have limited its use include severe anaemia, and neutropenia. All patients develop megaloblastosis with increased mean cell volumes. The haematologic changes are usually reversible with dose reduction. Blood transfusions may be required. Other toxicities include nausea, headache, insomnia, and myopathy.

The recommended dosage is 100 mg of zidovudine five times a day (four hourly but the 04h00 dose is omitted). The minimal effective dose has not been established. A dose of 100 mg three times a day with probenecid may be as effective and is being evaluated. The benefits of zidovudine in AIDS patients are not permanent.

ddI has recently been licensed. In most studies it has been used after zidovudine failure or in combination with zidovudine.

Its major toxic effects are peripheral neuropathy and pancreatitis. Rarer side effects include hepatitis, electrolyte disturbances, diarrhoea, hyperuricaemia, and seizures. It causes much less bone marrow suppression than zidovudine. Recommended doses are 5-8 mg/kg/day in two divided doses, though lower doses are being assessed.

Conclusion

Routine history taking and focused physical examination play an important role in the assessment of HIV infection. Laboratory tests are useful in staging and in diagnosis of infection. These guidelines may change as more clinical questions are answered and new drugs are developed.

BIBLIOGRAPHY

HIV and tuberculosis

The incidence of tuberculosis (TB) in the United States of America is increasing for the first time since 1984 and is especially marked in areas where there is a high frequency of human immunodeficiency virus (HIV) infection, such as New York City and the states of Florida and California. Tuberculosis is widely recognised in sub-Saharan Africa as the most common opportunistic infection in persons infected with HIV. In South Africa, infection with *M. tuberculosis* is endemic, especially among the black and coloured populations. The case rate for all population groups is approximately 200/100 000, but this can vary from 10/100 000 (RSA whites) to 800/100 000 (blacks and coloureds in certain parts of rural western Cape). With HIV infection showing significant entry into the heterosexual population, particularly the black heterosexual population, an increasing number of cases with both infections can be expected.

Pathogenesis

To understand the interaction between HIV and TB, it is necessary to consider the natural cycle of TB (Figure 1). The TB infection commences with the acquisition of bacilli by a susceptible person via droplet infection from an infectious case. Following a primary infection, usually in the mid-lung region, the bacilli multiply, pass via the lymphatics to the bloodstream and a bacteraemia (usually "silent") results. The circulating bacilli "seed" various secondary (metastatic) foci, usually in sites where the oxygen tension is high and establish foci of infection. The common sites involved are the apices of lungs, meninges, kidneys, long bones and vertebrae. By this stage cellular immunity has been established and this strong cellular response terminates the infection and in 85% of cases complete healing (sterilisation) of the lesions takes place. This is usually accompanied by scar formation. In a small percentage of cases, progression to overt disease can take place at this stage. In the remaining 15%, incomplete sterilisation of the lesions occurs and viable bacilli remain within the scar and they have the capacity, under certain circumstances, to reactivate and cause disease. These foci are called dormant foci and the reactivation process is referred to as endogenous reactivation.

HIV infection leads to a compromise of the infected individual's cellular immunity (Figure 2). It can therefore be readily seen that HIV can have an effect both earlier and later in the natural cycle of TB infection. In the early stage, progression of the primary lung infection occurs and disease at various extra-pulmonary sites results from the early bacteraemia. It is well known that extra-pulmonary TB (EPTB) is a common accompaniment of HIV infection. Because of compromised cellular immunity, HIV infected persons are likely to have rapidly progressive primary disease instead of a sub-clinical infection. The effect exerted by HIV early in the TB cycle is commonly seen in areas where TB is non-endemic and immunosuppressed individuals encounter the TB bacillus for the first time.

In many areas where TB is endemic (sub-Saharan Africa), most adults have been previously infected with TB and many harbour latent (dormant) infection. In these patients a reactivation of the TB occurs consequent on the immunosuppressive effect of the HIV infection. In this regard it is important to note that *M. tuberculosis* is a high-grade pathogen and is able to establish infection early in the course of immunodeficiency and in fact may be the first opportunistic infection encountered by the HIV infected patient. This is in contradistinction to low-grade pathogens, such as *M. avium intracellulare*, where...
infection is associated with more advanced immunodeficiency. Exogenous re-infection rather than endogenous reactivation may be an important mechanism in cases of relapse following a standard course of anti-TB chemotherapy.

Clinical features

Tuberculosis in HIV infected patients, as in other populations, is primarily a pulmonary infection. HIV-associated cases seen early in the course of infection demonstrate the more "classic" tuberculosis picture, namely cavitating upper lobe disease. With waning immunity as measured by a depression of CD4+ lymphocyte counts, the clinical picture is different with more involvement of extra pulmonary sites.

Symptoms include fever and night sweats, weight loss, anorexia, cough, sputum production, dyspnoea and pleuritic chest pain. As many of these symptoms are common to AIDS with an accompanying opportunistic infection, diagnosis of tuberculosis may be difficult or delayed. However, abrupt onset of pulmonary symptoms is unusual for TB and is more suggestive of pneumonia caused by *Pneumocystis carinii* or a pyogenic organism.

The World Health Organisation (WHO) has proposed a clinical case definition for AIDS, which may be useful in regions lacking facilities for laboratory testing of HIV infection or confirmatory testing of opportunistic infections. Both tuberculosis and HIV infection lead to chronic ill health and wasting and both are associated with persistent cough and fever. These similarities, compounded by difficulties in diagnosis, may lead to patients with tuberculosis being diagnosed as having AIDS alone and might therefore fail to receive appropriate treatment. This was illustrated in a study in Zambia where serum samples were found to be negative for HIV antibody in 25% of 72 patients being treated for tuberculosis who fulfilled the WHO's clinical criteria for AIDS. The presence of diarrhoea, generalised lymphadenopathy, oral candidiasis and current or previous herpes zoster infection tends to be predictive of concurrent HIV infection.

Extrapulmonary disease may be present with or without co-existing pulmonary disease. The common sites involved are lymph nodes, blood, bone marrow, urinary tract and central nervous system. Other sites which may be involved included the pleura, pericardium and the bowel.

Diagnosis

Radiological features

The radiographic appearance of TB in HIV disease many vary with the degree of immunodeficiency. With more advanced HIV disease (low CD4 count), a diffuse pulmonary infiltrate is more often seen, although focal consolidation may be present. Cavitatory lesions are uncommon. Intrathoracic adenopathy may be found in up to 25% of patients with HIV-related TB. This is an important finding and should arouse suspicion of tuberculosis as this finding is not usually associated with *P. carinii pneumonia* (PCP) or persistent generalised lymphadenopathy. In patients with less immunosuppression, chest radiographs are more "classic" or typical with upper lobe infiltrates that may cavitate. This is due to a granulomatous response resulting from a reasonably intact cell-mediated immune mechanism. The chest radiographs in several patients with HIV infection, who had documented pulmonary TB, have been reported to be normal at presentation. In TB meningitis in particular, both in patients with or without HIV infection, the chest radiographs may be normal. It is important to remember that HIV infected individuals with tuberculosis may develop PCP, cytomegalovirus, pneumonitis and other pulmonary manifestations of HIV disease as their immunosuppression progresses. Evaluating new infiltrates under these circumstances may be particularly difficult.

Laboratory investigations

Specimens of induced sputum should be stained for acid-fast bacilli and cultured for mycobacteria. Sputum smear examination has long been a cornerstone in the diagnosis of TB, particularly in rural areas, where culture and chest radiography may not be available. However, recently problems regarding the sensitivity of the smear examination have been highlighted in a study in Zambia. In this study among patients proven to have pulmonary TB, 37% of HIV-positive patients had negative sputum smears.
compared with only 18% of those sero-negative for HIV. The specificity of a positive smear test is high because atypical mycobacterioses occur infrequently in sub-Saharan Africa. Because culture results may often be delayed, a positive acid-fast smear should be presumed to be M. tuberculosis and therapy should be initiated while awaiting culture confirmation. Delay in commencing treatment is to be avoided at all costs because outbreaks of nosocomially acquired TB in HIV-units can occur and these infections may progress with rapidity.

Tuberculin skin testing
Tuberculin skin testing with 5 tuberculin units of purified protein derivative (PPD) should be performed in all HIV-infected patients. Although many patients with advanced HIV infection may be anergic, one-third to one-half of patients with AIDS and TB have a 10 mm reaction to PPD. One-half to three-quarters of HIV-seropositive patients with tuberculosis, but without AIDS react to PPD. Because HIV infection causes a decreased re-action in the tuberculin test, as a general guideline, reactions of 5 mm induration should be considered indicative of tuberculosis. When available, PPD-negative patients should be tested for delayed type hypersensitivity (DTH) using antigens such as candida, mumps or tetanus toxoid (commercial kits are available). Persons with a positive DTH response to one or more of the DTH antigens, but not to PPD tuberculin, are not considered to be infected with M. tuberculosis. Patients anergic to both DTH and PPD whose risk of tuberculosis is high should be considered for chemoprophylaxis after tuberculosis is excluded. A CD4 count is recommended in an assessment of anergy, but should not be regarded as a substitute for anergy testing. In the assessment of PPD reactions a prior history of BCG (Bacillus of Calmette and Guérin) administration must be taken into account. Prior administration of BCG appears to maintain tuberculin reactivity at higher levels than in persons with "natural" mycobacterial infection. Therefore, prior BCG vaccination complicates the interpretation of skin test results and decisions about preventive therapy.

Diagnosis of extrapulmonary disease
Extrapulmonary disease may present with or without co-existing pulmonary disease. The common sites involved are lymph nodes, blood, bone marrow, urinary tract, liver and central nervous system. Mycobacterial blood cultures should be performed as a routine and can be positive in up to 40% of patients with dual infection. When the clinical picture suggests EPTB, aspiration biopsy of the involved organ/lymph node should be done and the specimen submitted for staining and culture. Fine needle aspiration is particularly suitable if peripheral lymphadenopathy is present. Pleural effusion should be aspirated, and, if necessary, pleural biopsy should be performed. Central nervous system disease can produce ring-enhancing lesions on computed tomography.

Treatment
Standard antituberculosis drugs are effective for treating tuberculous patients with HIV infection. Regimens as recommended by the CDC include isoniazid(INH), rifampicin and pyrazinamide. These regimens are compatible with those in use in South Africa. Ethambutol may also be used if resistance to isoniazid is suspected or in the presence of central nervous system involvement or in disseminated tuberculosis infection. Pyrazinamide and ethambutol should be discontinued after 2 months of therapy if the isolate is susceptible to INH. Continuation therapy should include INH and rifampicin. Some clinicians have recommended streptomycin by injection twice weekly for 3 months. However, there may be objections to its use in Africa. The total duration of treatment is unclear. The CDC recommended that treatment should be given for at least 6 months beyond conversion of sputum cultures (at least 3 negative cultures). Extrapulmonary disease should be treated with standard regimens for at least 9 months - 1 year. The question of life-long chemoprophylaxis after completion of the primary course of treatment remains controversial. Some authorities recommend continuing with INH indefinitely, whereas other recommend careful monitoring of the patient. As a consequence of the immunosuppression associated with HIV infection, reinfection with TB is a real risk in endemic areas. There is a higher incidence of adverse drug reactions in HIV infected patients. Thiacetazone, in particular, has been most implicated, but reactions have occurred with other TB drugs. This may, in fact, be due to a greater degree of abnormal liver function in patients with AIDS. Rifampicin and INH can interact with ketoconazole and fluconazole and can render antifungal treatment ineffective. If ketoconazole and rifampicin are taken at the same time, rifampicin absorption is inhibited and failure of the tuberculosis treatment can result.

Cases of multi-drug resistant TB isolates are being reported in HIV infected patients. This is also becoming a problem in the developing world. The reasons for this are numerous, among them lack of compliance, lack of access to health care and unavailability of "front-line" drugs. The implications of dissemination of multi-drug resistant organisms in the community at large are enormous.

Several proposed new approaches to the therapy of TB include intensive short course therapy, combination of drugs in a single tablet to improve compliance, and immune therapy using suspensions of killed M. vaccae by injection.

Chemoprophylaxis
It is important that all HIV-positive patients have a Mantoux skin test with 5 units of tuberculin PPD. If the skin induration is 5 mm or greater, a chest radiograph should be obtained and the patient examined for extrapulmonary disease. It must be remembered that some patients may be negative on testing. If active tuberculosis is excluded, chemoprophylaxis should be carried out. Chemoprophylaxis should commence relatively early in the course of the HIV infection as break-through infections occur relatively early in the course of the disease. In one study the median CD4 count in HIV-seropositive patients was 326/mm³ compared with 928/mm³ in HIV-seronegative patients.
Various prophylactic regimens have been proposed. Lifelong prophylaxis with INH alone, or INH alone for 12 months and a full short course regimen have been suggested. Clearly, further research is necessary in this regard.

**BCG vaccination**

Although a theoretical risk exists, evidence for an increased rate of adverse reactions after BCG immunisation among asymptomatic HIV infected individuals remains inconclusive. In developing countries where the risk of acquiring TB is high (as is the case in South Africa), BCG vaccination is recommended at birth or as soon as possible thereafter. Vaccination is recommended for asymptomatic HIV infected individuals who have not been vaccinated previously. For symptomatic HIV infected individuals, BCG should be withheld.

**Conclusion**

TB remains a major health problem in South Africa. The emergence of the HIV epidemic is likely to have significant implications for the diagnosis, management and control of TB in this country. The unusual clinical features emphasize the importance of considering a diagnosis of TB in a person with known or possible HIV infection and, conversely, a diagnosis of HIV infection in a person with an aggressive or atypical presentation of TB.

**REFERENCES**

HIV infection in pregnancy

Introduction

Humans are immunodeficiency virus (HIV) infection has become one of the most common serious infections encountered in obstetrics. It has been estimated that an obstetrician in the USA presently has a higher chance of seeing an HIV-positive pregnant woman in his or her practice than an eclamptic woman or a child with congenital herpes disease. Despite this, there is relatively little literature on the practical aspects of the management of HIV-positive pregnant women or clear evidence about the risks of transmission to the fetus and ways to reduce this.

The majority of the world’s three million infected women are in Africa, living in developing country conditions with little access to medical care. The sexually active age group is at risk of HIV infection and these women are also in the reproductive age range. The incurable nature of the infection, the poor long term prognosis for the mother and the risk of transmission to the fetus during pregnancy make HIV infection and AIDS extremely difficult to manage for many doctors.

Pregnant women constitute an important sentinel group to monitor the progress of the HIV epidemic within the community. They are widely accepted as an indicator of the greater "normal risk" sexually active population. At Baragwanath, serving the Soweto area, HIV positivity in women attending the antenatal clinic has risen from 0,03% in 1989 to 3,5% in mid 1992. The doubling time remains in the region of 9 to 12 months.

Testing

Many obstetricians have embarked upon a policy of routine testing for HIV antibodies in antenatal women, even in those populations where there is a very small chance of a woman being infected. A number of advantages have been put forward for this. Foremost may be the opportunity to advise women about their HIV-positive status, enabling them to make informed decisions about the current pregnancy, their future fertility and their future sexual conduct. In addition, should they decide to proceed with pregnancy, some alteration in their antenatal care and in the conduct of the labour may be advised, screening for possible related complications and trying to prevent practices which may add to the risk of transmission to the baby at the time of delivery.

A recent editorial comment in the SAMJ from a group of Cape Town academics put forward the view that HIV testing in pregnancy was not only justifiable, but essential. They argue that diagnosis in pregnancy will reduce the numbers of AIDS orphans and increase awareness of the disease in the community.

While this viewpoint may have sound economic and medical reasons, it may not take into account some of the social problems which are faced by the population of women at high risk. Decisions on future fertility and modification of sexual behaviour including condom usage, require the knowledge and consent of both partners. Our own experience at Baragwanath, and that in some other African countries has been that women are very reluctant to inform the male partner and that they face rejection and possible physical harm if they do. Other studies have shown that less than half of the HIV-positive women identified during pregnancy will agree to termination, and that subsequent decisions about fertility are also not always affected by knowledge of the disease.

To be acceptable and successful in changing obstetric practice and maternal behaviour, testing must be done with the knowledge and consent of the patient. There must be provision for full post-test counselling and a positive result must not be used as an excuse to refer the patient on to another institution for fear of the disease on the part of the doctor. Unfortunately, particularly in the private sector of South African obstetrics, this is not always the case.

Effect of HIV on pregnancy

HIV infection may affect either the mother or the fetus. In asymptomatic HIV infected pregnant women there may be no effect and no way in which the infection would be picked up other than testing. HIV-positive mothers should be screened for other sexually transmitted diseases, given the associated risk factors. A Baragwanath study showed that 33% of HIV-positive pregnant women also had positive syphilis serology as opposed to 10% of the HIV-negative women.

Infected mothers appear to be at higher risk of serious infections during the pregnancy. They should be screened for tuberculosis, the most common opportunistic infection associated with HIV in this country. They may also be at higher risk of urinary tract infections during the pregnancy and have a higher prevalence of chorioamnionitis.

While many studies from Europe and the USA have shown no effect on the outcome of pregnancy in HIV-positive women, other African studies have shown a higher rate of stillbirth and other pregnancy loss, intrauterine growth retardation and prematurity. It may well be, as with other features of HIV disease in pregnancy, that these differences are related to the stage of the HIV infection, with more complications as the women progress further in the time scale of the disease.
Where a woman is known to be HIV-positive during the pregnancy, antenatal care should include regular follow up to detect intra-uterine growth retardation, either by symphysis fundal height measurement or, if available, serial ultrasonography.

Treatment with Zidovudine (AZT) has been given during pregnancy in a growing number of women in the western world. The drug crosses the placenta and reaches levels equivalent to those of the mother in the fetus. One of the fears about its use in pregnancy has been that it would cause severe anaemia in the fetus. Reports from the United States seem to indicate that it can be used in pregnancy with relative safety, given in the same doses as to non-pregnant women. Current recommendations, where the drug is available, are to use it where CD4 cell counts have dropped below 400, even in the presence of pregnancy. The drug does not cure HIV disease but has been shown to improve the quality of life of patients by decreasing the number of serious infections in the later stages, and may improve survival if started at a relatively early stage.

Effect of pregnancy on HIV disease

Some early reports suggested that progression of HIV infection and AIDS was hastened by the effects of pregnancy. This was based on reports of a rapid progression to symptomatic AIDS in some series and on a more rapid drop of CD4 cells during pregnancy which did not resolve after delivery. More recent work has not confirmed these findings and the present state of knowledge suggests that, in asymptomatic or early HIV infection, there is no increase in progression of the disease. A recent study from Edinburgh has shown no difference in survival times of HIV positive women who became pregnant compared with those who did not. This may not be true in women who have full blown AIDS at the time of pregnancy, where there may be deterioration of their condition. As with other areas of study it is difficult to extrapolate the results of European and American studies, based predominantly upon women with other social and medical problems such as intravenous drug use, to the situation in Africa and further local studies are required to confirm these findings.

Transmission to the infant

"Vertical transmission" from mother to child is the source of infection for over 80% of the infected children world-wide. Reported rates of transmission vary from under 20% in some European studies to 60% in a study from Zaire. The factors affecting the rate of transmission remain unclear. It is accepted that more advanced ma-
Pregnancy

Pregnancy viraemia at this time. If this is increased risk of transmission to the fetus, as are low CD4 counts and previous delivery of an infected child. More recently it has been suggested that transmission is increased if the women is pregnant within the first year after seroconversion, assumed to be due to the increased viraemia at this time. If this is confirmed, it would suggest that the rate of fetal infection would be increased in areas of rapid spread of the virus. It would also be increased where women have been HIV-positive for longer. Both of these conditions apply to areas of central Africa, where reports of high transmission rates are common.

The mechanism of infection of the infant has not been clearly demonstrated. Three possibilities exist. The virus could be transmitted in utero during the pregnancy, at the time of birth during passage through the birth canal and by means of breast feeding.

Several studies have demonstrated the presence of the virus in fetal tissue from late first and early second trimester specimens. Recent attention has, however, focused on the possibility of infection during birth. These reports have been based on a reported higher rate of infection in first born twins. One series showed an incidence of infection of 52% in first born and 24% in second born twins, thought to be possibly due to the longer period of exposure to infectious cervical and vaginal secretions. Further work is needed to confirm these suggestions.

The role of breastfeeding in the transmission of HIV to infants also remains controversial. The virus has been isolated from breast milk and is shown to be infectious by this route. The risk of this mode of infection does appear to be higher in women who become infected while breast feeding or shortly before birth, and some believe that the additional risk of transmission by breast milk in a mother who has been HIV-positive through the pregnancy is small. This has been questioned by studies such as the European Collaborative study which have shown an increased rate of infant infection where mothers breast feed. A number of conflicting recommendations have been put forward by various bodies either in favour of or against breastfeeding. Where adequate social and financial facilities exist, many medical workers would advise in favour of bottle feeding.

Once again it may not be possible to take First world findings as appropriate for Africa. Ryder et al in a study from Zaire, showed that, in their circumstances, there was no significant increase in the rate of infected children from breast feeding mothers. Those children who were breast fed had significantly lower rates of diarrhoea, bacterial respiratory tract infections and fever than the bottle fed babies. Since these common infections are the major causes of death for HIV infected infants in our local situation, this should be borne in mind when advising patients.

Management of HIV-positive pregnant women

The management of HIV-positive women during and after their pregnancies requires both medical expertise and a high level of acceptance and concern from the medical practitioner. Most infected pregnant women only discover their diagnosis during the pregnancy. The psychological trauma of this is immense. From a state of excitement about their ability to bring new life into the world, they have to deal with the diagnosis of an incurable disease, to confront their own mortality and the possibility that their child may also be affected.

Counselling has to address the woman’s knowledge of the disease, the implications for the child and her sexual partner and has to attempt to persuade her of the need to tell her partner and take appropriate precautions. Termination of pregnancy may be offered, if the woman so desires, if the diagnosis is made early enough in the pregnancy.

Regular antenatal care as described above should be offered. During labour any procedure which may break the skin of the infant may, theoretically, increase the risk of infection. Thus scalp electrodes should be avoided unless absolutely necessary, as should scalp blood sampling and vacuum extraction deliveries, which are more likely to cause small lacerations than forceps. At present there has been no conclusive evidence of an advantage of Caesarean section delivery and the mode of delivery should be determined by the prevailing obstetrical indications.

Conclusion

HIV disease and AIDS in pregnancy will become a common clinical problem in obstetrics over the next few years. Medical staff working with infected women will need to be informed of the medical and social consequences in order to adequately treat and help these patients. AIDS will challenge not only our ability to tackle medical and obstetrical problems but also our humanity.

REFERENCES

HIV infection in children

The vast majority of HIV infections in children occur as a result of vertical transmission from an HIV infected mother to her baby. Available studies have documented varying HIV transmission rates ranging from 13% to 65%. A diagnosis of HIV infection should be considered if the mother is known to be HIV-positive or if the child presents with signs and symptoms compatible with HIV infection.

Children at risk for HIV infection

In contrast to "First World" experience, adult-adult HIV transmission in Africa is mainly through (hetero-) sexual contact. At the current stage of the epidemic in South Africa, infected mothers are relatively well educated and no more promiscuous than uninfected mothers. An important risk factor that stands out strikingly is travel, either by the mother or the father, to the north of South Africa. An additional risk factor may be the acquisition of the infection by the mother soon before, or during the pregnancy. Seroconversion during breast-feeding may also be a risk factor for enhanced transmission risk via this route.

Presentation of paediatric HIV infection

Current laboratory tests are not always helpful in distinguishing between infected and non-infected babies born to HIV-positive mothers. As a result of transplacental passage of maternal antibodies the infant will invariably test positive with the HIV ELISA test. The infection status of these babies is then designated as indeterminate (Class P0) unless they develop typical signs and symptoms. Using sophisticated techniques (see "Other Aspects", below) it may occasionally be possible to identify infants that are asymptomatic but infected (Class P1).

Symptomatic children (Class P2) may be divided into:

Symptomatic-Not AIDS

Children who are symptomatic but without AIDS indicator disease:

- Persistent/recurrent oral candidiasis;
- Persistent parotitis;
- Persistent diarrhoea;
- Persistent hepatomegaly/splenomegaly;
- Persistent generalized lymphadenopathy;
- Thrombocytopenia;
- Severe recurrent varicella infection;
- Nephropathy;
- Cardiomyopathy.

Symptomatic-AIDS

Children with AIDS indicator disease:

- Opportunistic infections;
- Lymphocytic interstitial pneumonitis (LIP);
- HIV encephalopathy;
- Severe recurrent bacterial infections;
- Severe failure to thrive;
- Malignancy.

Natural history of HIV infection

About one third of children with vertically transmitted HIV infection develop severe disease in the first year of life. The rest present with a more slowly progressive course. Children presenting under 1 year of age with opportunistic infections or HIV encephalopathy have a poorer survival than those presenting at an older age with bacterial infections or LIP. LIP is a slowly progressive chronic lung disease with a characteristic reticulonodular infiltrate on the chest radiograph. The children are initially asymptomatic and later develop dyspnoea, hypoxia, and digital clubbing.

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Serologic tests for HIV antibody

All serologic tests detect anti-HIV antibodies by their ability to bind to viral antigens. An antibody test is considered positive only if a screening test such as an ELISA is repetitively reactive and a confirmatory test such as a Western Blot has been performed to validate the result.

"Rapid" HIV test

A number of kits are available and results may be obtained within 10 minutes of receipt of a specimen by the technologist. As the sensitivity of the rapid test is approximately 100%, a final negative report can be issued immediately. However, as the specificity is less than 100% (high risk of false positives), only an interim positive report can be issued to the doctor concerned, pending confirmatory tests. The patient should not be informed of a positive result until a confirmatory report is issued.

HIV Enzymes Linked Immunosorbent Assay (ELISA)

The sensitivity and specificity of this test exceeds 99%. Test serum is incubated with HIV antigens and treated to detect a spectrophotometric colour change which can be graded depending on the amount of antibody present in the sample.

Western Blot

The Western Blot assay is a more specific test and is used for confirmation of positive ELISA tests. A Western Blot can be interpreted as positive on the identification of two of the fol-
lowing HIV gene products: p24, gp41, or gp 120/160. If fewer bands are present, the test is considered indeterminate. It is interpreted as negative only if no bands are present on the blot.

Other assays
Other means of detecting HIV infection include testing for viral antigen (p24), viral DNA (polymerase chain reaction) and viral culture.

Immunologic abnormalities

One of the earliest immunologic manifestations of AIDS is a polyclonal hypergammaglobulinaemia. The $\beta_2$ microglobulins are often elevated. Enumeration of lymphocyte subsets and helper-suppressor (CD4:CD8) ratios often forms part of the evaluation of a child with HIV infection. The usefulness of these tests in paediatric populations with HIV infection has not been well studied and age specific values still need to be established.

Management of the child with HIV infection

Follow up of the child born to an HIV-positive mother
A child's infection status may be determined by identification of early manifestations of the disease or evidence of immunosuppression. Maternal HIV antibodies may persist for up to 15 months and a negative test after this time implies that the child is not infected. With the combination of careful clinical evaluations and the use of surrogate markers it is usually possible to determine whether a child is infected or not.

Immunizations
The World Health Organisation recommends that all vaccines be given as normal except for BCG which should not be given to symptomatic children.

Prophylaxis

**Pneumocystis carinii pneumonia**
Prophylaxis for pneumocystis carinii pneumonia should be offered to any child who previously required treatment for this infection. If CD4 counts are available primary prophylaxis may be offered depending on CD4 counts (Table 1).

<table>
<thead>
<tr>
<th>Age</th>
<th>CD4 counts</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-11 months</td>
<td>&lt;1500</td>
</tr>
<tr>
<td>12-23 months</td>
<td>&lt;750</td>
</tr>
<tr>
<td>2-6 years</td>
<td>&lt;500</td>
</tr>
<tr>
<td>6 years</td>
<td>&lt;200</td>
</tr>
</tbody>
</table>

Drug: Co-trimoxazole (Trimethoprim 150 mg/m², Sulfamethoxazole 750 mg/m²) 3 times weekly.

**Bacterial infections**
It is possible that pneumocystis prophylaxis may also prevent recurrent bacterial infections. The use of intravenous immunoglobulin infusions to prevent recurrent bacterial infections is currently under investigation.

**TB Prophylaxis**
HIV infection is considered the highest known risk for progression to active TB. Every effort must be made to diagnose and treat TB as per standard protocols. INH prophylaxis has been advocated for HIV infected children. Factors that need to be evaluated before widespread INH prophylaxis is recommended are the potential toxic effects of INH and the development of INH resistance, especially once large numbers of patients are treated.

Breast feeding
At this stage studies suggest that transmission via this route is uncommon. It is generally believed that in developing countries breast feeding should be encouraged as protection provided by breast milk against diarrhoea and other infectious disease may be critical to infant survival. It has been suggested that breast feeding may delay the onset of symptomatic disease in the child infected with HIV.

Other aspects
Apart from preventing infections (by immunization and prophylaxis) prompt treatment of bacterial and opportunistic infections is necessary. Early nutritional support to prevent failure to thrive may be necessary. As HIV may affect a number of family members, family centred care where all members of the family can receive medical and social care and follow up needs consideration. A number of resource centres are being established throughout the country. Home based care forms an important facet to the management of HIV infected individuals.
HIV and AIDS - a counsellor’s perspective

Embarking on my studies in psychology in the late seventies I was the epitome of innocence and well intentioned philanthropy. There I was, a first year student with bright eyes and a bushy tail, determined to bring light and cheer to the world. Fifteen years later the transformation is complete. Now I tell people they are HIV-positive and help them to look at why they have been singled out to bear the brunt of a relentless disease and societal revulsion. Now I deal with pain and bitterness, and anger and depression, guilt and blame, hope and despair. In the absence of a cure or a therapeutic vaccine, this is a job which stretches to the limit one’s ability to deal with endless misery and helplessness. Yes, there are times when one is able to help people to live more productive and interesting lives and there is a sense of satisfaction in helping someone survive a crisis. But in the end it boils down to what one of my clients said to me once - “Have you heard about wild animals when their leg is caught in a trap, they bite the leg off to escape. Being HIV positive makes you want to do the same.”

This work challenges all of us who deal with HIV in any way to confront our prejudices around sex and sexuality, our understandings of social forces, our ultimate powerlessness in the face of the inevitability of death. But most of all we are challenged to confront our own discomfort with human pain and our unwillingness to delve in the muck and gore of emotions. We are so tempted to “make nice”, to cure, to treat that we dismiss, patronise and ultimately diminish the people we help.

If I was to give any advice to a health worker when working either with someone contemplating the HIV test or someone who is HIV-positive it would be: to treat your patient as someone who is capable of making decisions (even if it takes time and thought for the decision to be made), give your patient as much information as possible to make informed choices, consider the patient’s social context and most of all, be prepared to acknowledge the fears and feelings associated with an HIV diagnosis. Your patient, once identified as being infected with HIV, is living with a sense of loss and uncertainty. He or she is often forced to contemplate a shortened future and there are many tough decisions to be made.

A corollary of all of this is that health workers need to be aware of how their own prejudices, fears and attitudes impinge on their relationships with patients. If you have never confronted your own mortality, how can you possibly help someone else to confront theirs? The bottom line of a healthy doctor/patient relationship is: give the person space to be human. Patients are not objects, they have lives, relationships and emotions.

A good place to put this into practice is with HIV test counselling. Far too often this test is seen as just another in a long list of investigations. But the reality is that once you are diagnosed HIV-positive, life changes forever. We need to give people time and space to make thoughtful and considered decisions to test for HIV. How do we do this?

By exploring the reasons for coming for the test we help the person to clarify their understanding of HIV and AIDS and put their risks into perspective. By examining the costs and benefits of testing we encourage people to carefully evaluate how HIV will impact uniquely on their lives. By exploring how someone will react to a diagnosis we help them to start preparing for the result and we get an idea of their support system. By explaining how the tests work we allay fears of mistakes. This kind of preparation is an opportunity to build rapport with a person and lays the groundwork for giving the result. It can also be done in twenty minutes (this should be seen as a minimum). Obviously, if you have had counselling training it can take much longer.

I encourage my clients to think about the decision and even to come back if they are not sure. I tell them about safer sex so that if they choose not to have the test they still have information (written, if available) on how to protect themselves and their sexual partners from contracting the virus. I try not to judge the sexual lives of my clients and rather discuss ways of making what they do in bed safer for them. I refrain from making the decision for the client - they have to live with the consequences, not me. I make sure the client knows he or she will not get the result over the telephone because it is too serious. Above all, I acknowledge that many fears and feelings are aroused by pre-test counselling and I support him or her in the vulnerabilities which are thus exposed.

What can you do if you give someone an HIV result? When it is negative, make sure your patient understands the implications of this, i.e. they do not have special immunity, they might be in the "window period" and they should still (or start to) practice safer sex. I find it useful to normalise the tensions of waiting for the result and to explore what the test process has meant for the person. This tends to leave them more resolved and "talked through" about what for some feels like a near-death experience.

When the result is positive you are confronted in a most disturbing way with your own helplessness and it is at such a time that one feels "deskilled". What you can do is listen and acknowledge your patient’s feelings. Allow as much time as your patient needs to ventilate and to take in such profound news. Long
silences, crying, disbelief, questions about years left are all appropriate. All these (and other) responses must be seen as normal and natural coping mechanisms. Try and avoid the temptation to reassure and cheer up the patient - at best this is well-intentioned, at worst it is insulting and meets the needs of the health worker only. Focus on small pieces of information and try to give your patient something to take away and read. Explore how your patient will pass the next 24 hours and if possible arrange a follow-up appointment for the next day. By then the person will usually be able to start discussing "where to from now?" questions.

I also find it helpful to identify one person for the patient to tell about the result as there is often the temptation to confide in crisis, with disastrous results. As time passes and the person begins to come to terms with the result, most of them choose to tell very few people.

Now you are in a position to look at referral, management and support. No one really knows what the future holds but if you are willing to work honestly and empathically with your patient a trust relationship may develop. This allows for an open doctor-patient dialogue. Remember though that some people go into denial about their HIV status because they are unable to deal with such information. This is a protective mechanism and it is not possible to force someone out of denial. This denial is often indicated by not returning for follow-up. Like the trapped animal, there is a need to lick one’s wounds. Remember also that when someone has accepted their HIV diagnosis it does not mean they are happy about it - acceptance means learning to live with the virus.

One issue which remains difficult is the involvement of the sexual partners of someone with HIV. In my experience most people with HIV are willing to inform their partners about their HIV status and are concerned about infecting others. Where there is a steady relationship of some standing, inevitably both partners are infected and there are children (potential or existing) to consider.

Sometimes there is a reluctance to inform partners for fear of rejection, violence and withdrawal of financial support. It is absolutely essential that we understand two things here. Firstly, if we rush in and inform the partner ourselves we have absolutely no control over how this information is received and acted upon. This is no time to play God. Secondly, we need to disabuse ourselves of the notion that we can single-handedly change the course of this epidemic - the forces operating on our patient’s lives are much greater than us. What we can do is to encourage the patient to take on the responsibility of telling by acknowledging their anxieties and exploring the complexities of breaking such news. It is also my belief that most people who pass on the virus do so without even knowing that they are HIV-positive. Partner notification should be carried out with sensitivity and forethought - it is but one tool in the armoury of the HIV battle.

All of us have a role to play in the HIV/AIDS story. If we take up this challenge we must acknowledge our limitations, we must be prepared to look into ourselves and try to learn to tolerate the pain and misery our patients (and sometimes we ourselves) feel.

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Preventing HIV Infection by Safer Sex

Introduction

Safer sex means preventing the exchange of body fluids during sexual intercourse, or ways of having and enjoying sex without the man's penis entering his partner's body.

Preventing the exchange of body fluids during sexual intercourse

The HIV virus is transmitted in semen and vaginal fluid. If you prevent these fluids from entering each other's body then you will prevent the possible spread of HIV.

Condoms are the only way to prevent this exchange of fluid during sexual intercourse. Condoms need to be available and they must be used properly.

How to use a condom effectively

Advise the following about condoms:

• Condoms should only be used once. Old condoms or condoms which have been left to dry out in the hot sun will break easily and should not be used.

• Squeeze the air out of the tip of the condom with your thumb and forefinger as this will help prevent an air bubble forming at the tip of the condom.

• Place the condom on the penis when it is erect and role the condom all the way down the penis.

• Immediately after the man has ejaculated he should remove his penis from his partner. He must not remain in his partner as his penis will become soft and semen may leak out of the condom into his partner. He should hold on to the base of the condom as he withdraws. This will help prevent the condom slipping off inside his partner.

• Wrap the condom in tissue or toilet paper and dispose of it away from the reach of children.

• Do not use petroleum jelly (vaseline) or other oil based lubricants as these can weaken the rubber and cause the condom to break. It is best to use water basedjels such as KY jelly if you need lubrication. Saliva is a useful lubricant in times of an emergency!

Try to make condoms readily and easily available at all health services especially in primary care clinics, family planning centres, child health clinics, ante-natal clinics, sexually transmitted disease clinics, etc.

Ways to enjoy sex without penetration

A condom may not be readily available or it may be unacceptable for religious or other reasons. In this situation people can still enjoy sex without penetration. The following are some ways to enjoy sex without penetration.

• Masturbation can be enjoyable and satisfying and is a common method of achieving an orgasm. Each partner can masturbate each other. Some partners enjoy masturbating each other at the same time or separately.

• General body caressing can be very satisfying and partners can explore various ways of sexually caressing each other. Partners should talk and discuss with each other what is best and which body areas are most sensitive. Climaxing this caressing with masturbation can be very satisfying.

• Body sex is another safer sexual option. Here the man can have sex between his partner's thigh or on other parts of the body, e.g. the armpits.

• Oral sex may not be safe and if it is done, it should be done with a condom. With women it may be problematic and some use thin plastic such as Gladwrap to cover the vulvae during oral sex.

• Sex toys such as vibrators often help people to have sexual pleasure.

Anal sex is the most risky sex. If possible avoid anal sex or use an extra strong condom or 2 condoms for anal sex.

Alcohol, drugs dagga (marijuana, ganja) may make you more carefree and careless and influence you to have sex and to have it without taking precautions. If you are having alcohol or dagga or other stimulants then you may find yourself getting involved in unsafe sex and be unable to take control of the situation.

Sexual advice to people who are HIV-positive or who have AIDS

People who have HIV/AIDS must practise safer sex. In order to be safest it is best to avoid penetrative sex and to have other means of sexual enjoyment as discussed above. If penetrative sex is not avoidable then it is essential at the least to use a condom and to use it carefully and correctly. Kissing is not thought to transmit HIV but it is best to avoid deep kissing and oral sex.

Changing sexual habits and activities can be extremely difficult and may stress a relationship. Counselling may be required to help a couple cope with these changes.

Adapted from "Primary AIDS Care", Chapter 14 (In publication).
Aids, angst and apartheid

Finding ways in which to challenge the AIDS epidemic has proved to be one of the most difficult ever faced by health workers and social scientists. On the face of it the information appears to be very simple - a virus, which, leads to the destruction of the immune system, which is transmitted through sex, and which can with certain practices being adopted, be controlled. But it is perhaps this simplicity which belies the complexity of the disease and the challenge facing those of us who work towards finding ways to reduce its spread.

All epidemics can be seen as social events, even though they may, at first, appear to be natural, random phenomena. This is firstly because they have environmental and social causes and secondly because they become the focus of struggles for control over and allocation of resources. Epidemics tend to throw into relief, as the historical examples of syphilis and the Black Death have shown, deeply held social tensions and anxieties. The key issue is why did this disease, at this time, become the symbolic carrier of such a weight of meaning. Other new diseases have emerged in the recent past - Legionnaire's disease is the best known - and there have been some epidemics of others. Some such as genital herpes and Hepatitis B, have caused major bouts of anxiety and much social philosophising, in ways that prefigure the reaction to AIDS. But it was AIDS that became the disease of the eighties, and it was AIDS that came to public consciousness as the twentieth century plague.

AIDS confronts any society with all the prejudices, stereotypes and discrimination which do exist but tend to be ignored or even denied - from homophobia, racism and puritanism across to political participation and health care. In dealing with this epidemic we have to address these issues as well as the basic medical and clinical facts of the illness.

The legacy of apartheid in the area of health, and the consequences of years of violations of human rights will be with us for a long time. Many of the health care problems stem from migrant labour, the rural urban drift, urban living conditions and squatter camps. Poverty remains the primary cause of the prevalence of many diseases, and of widespread hunger and malnutrition. Diseases such as TB, pneumonia, gastroenteritis, measles and polio are preventable with adequate nutrition and good immunisation programmes, along with sanitation and water supplies. These diseases have all but been eliminated among the white population because of adequate standards of living and health care. Yet they are still common among black children and adults - a consequence of both dreadful living conditions and inferior or absent health care. On top of all this we now have to add AIDS which will serve to highlight and exacerbate the existing conditions.

In this light, it is important to treat AIDS in an objective and rational way. It is not just a question of telling people of a sexually transmitted disease that they can control by changing their behaviour. All too often peoples' behaviour is a direct consequence of the conditions under which they live and much as they might receive and understand the message they are unable to act upon it. This is something that is often overlooked in the education and information campaigns designed to confront the rapid rate of infection. Messages are no more homogeneous than the population - messages which might have some relevance to white middle class people hold little for families struggling with unemployment and no housing.

We have reached a point now where there is beginning to be widespread understanding of the nature of AIDS and its mode of transmission, but the way in which the epidemic has been handled over the past decade means that people have been subjected to a series of mixed, misguided or plainly inaccurate messages which have succeeded in confusing and scaring many people. Much of this damage could have been avoided if it had been realised that the ways in which the message is crafted and conveyed, and to whom, is just as important as what is being said.

For example - many campaigns still emphasise the need to reduce the number of sexual partners. The implication here is that the fewer sexual partners one has, the less the risk of infection. That is true as far as it goes, but it is actually beside the point. The message ignores the fact that a single unsafe act with an infected person is sufficient to transmit the virus. A more accurate and clearer message would state that it is what you do sexually, not how many times you do it, or with how many partners, that determines your risk of infection. The problem is that to "reduce the number of partners" is an epidemiologists message, relevant to rates of infection in the overall population, but irrelevant to the individual who wants to eliminate risk.

It is quite clear that people in different communities and classes can't make equal choices about their lives, and to suggest that they can, and that they can equally take responsibility for the way they live, is hypocritical. For example, men who are forced by the socio-economic system to become migrants cannot exercise the same control over their lives as someone who is able to live in a secure and comfortable environment. The messages must address these disparities - but they must also address the migrant labour system as part of the problem. So it is not the sex life of the miners alone and how

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many partners they do or don’t have which might aid the spread of the epidemic, but the policies of the mining houses and other industries who make use of hostels that contribute to the spread. The employers are part of the problem, and can only be fully part of the solution when they recognise that it is their employment practices coupled with the policies of the state that contribute to the spread of the virus, the stigma and discrimination and the denial.

When people are dealing with a daily battle against poverty, retrenchments, inflation, unemployment, collapse of schooling, boycotts and violence, it is very difficult for debate about HIV/AIDS to get the priority it deserves. Likewise when one is discussing AIDS, one is dealing with the most intimate aspects of peoples' lives - when they have sex, who with, how often, in what manner and so on. Up until now all the messages about sex have been couched in judgemental terms - gay, bisexual, promiscuous, safe people (heterosexuals) and dangerous people (all the rest). In these terms it is often made very difficult for people to discuss openly their fears and levels of risk for fear of being labelled and judged. The conservative legacy in the country, the strict censorship and the obsession with "morality" means that to get people to recognise what it is in their sexual behaviour that puts them at risk is very difficult. It seems almost as if people rather than acts define what is safer sex. Safe sex in these terms ceases to be a practice of sexual pleasure, but becomes instead an avoidance of sexual danger and as a threat to us and our society, the time has come for us to see AIDS as a threat to us and our society, the time has come for us to see AIDS as a threat to us and our society, the time has come for us to see AIDS as a threat to us and our society, the time has come for us to see AIDS as a threat to us and our society.

Along with developing new health care structures to care for people with HIV/AIDS and give support to their families, we must prepare the society for the other consequences of this epidemic - the loss of family members and friends, the experience of living in communities where there are many very sick people, the economic effects of home based care, the added disruption to the economy and education system, and the despair and frustration of those affected. We are generally used to having people die away from view, in hospitals, and we are unpracticed in talking about death. This must change. We must work towards a society where fear, prejudice and irrationality are replaced with reason, responsibility and collective action. In doing so we must also work towards a society where the position of women is challenged and corrected, where sex education and AIDS is taught in secondary and primary schools, where the human rights of all infected people are recognised, where the rights of orphaned children are defended and where we recognise that even in the face of all we know, of all the information available, of all the pain already experienced, people will not be able to change their behaviour in the face of this epidemic unless they can see hope for the future, an improved and secure lifestyle, as well as an honest approach to this epidemic from the health profession where they recognise that they are as much personally at risk as all the rest of us.

For too long AIDS has been seen as a threat to us and our society, the time has come for us to see AIDS as something that can liberate us from past oppressions, enable us to be more honest and open about our feelings and as a way of cementing our commitment to a future where this epidemic is controlled. Ultimately the nature and strength of the future society we wish to create is up to us.

Sensitivity of HIV-1/HIV-2 3rd Generation EIA Tests

HIV diagnostic screening tests are presently going through an upgrade from a 2nd generation format that only detected IgG antibodies to HIV-1 and HIV-2; to a 3rd generation format that detects both IgM and IgG antibodies to HIV-1 and HIV-2. The addition of the IgM antibody detection allows earlier identification of HIV positive specimens than was possible with the second generation test.

In practice numerous laboratories around the country have been able to demonstrate this earlier detection ability in specimens that are HIV-1/HIV-2 3rd generation EIA positive, but Western Blot Negative - initially thought to be false positives. These specimens had come from persons in the process of seroconversion.

Meanwhile these same laboratories have adopted confirmatory antigen testing to be carried out on all specimens which prove to be Western Blot Negative, but with an original positive EIA result by a HIV-1/HIV-2 3rd generation test.

Ongoing studies in this area expect to confirm the above findings. Potentially this will have major implications on HIV confirmatory algorithms as well as on the choice of EIA test used in blood screening.

Erratum

Nasogastric Tube Placement - A Plea for Safety, The Leech, 1992; 61(2): Page 26 Column 3 Line 6 - "seem" should be "seen". Page 27 Figure 3 should read CT Scan.