HIV Infection In 2011 And Beyond

Modern antiretroviral therapy can convert infection with the human immunodeficiency virus (HIV) from a uniformly lethal disease to a manageable chronic condition with estimated life-expectancies approaching that of the general population.

Any individual in Australia who is diagnosed with HIV infection in 2011 can expect to avoid hospital admissions, serious opportunistic infections, continue to work, travel, and have relationships, children and families. This is contingent upon a diagnosis being made before severe destruction of the immune system has occurred as well as life-long engagement with health services and strict adherence to daily antiretroviral therapy. Australia remains a low prevalence country in general with sections of the community who are relatively well-informed about HIV and would present early after a possible exposure to request testing. However there have been rising rates in the last few years, involving a greater diversity of cases outside the more well-informed groups. WA in particular is experiencing shifts in the epidemiology which are unique compared to other states and which mean that general practitioners will see patients who are unaware that they have HIV infection and indeed may have developed symptoms associated with immunodeficiency. GPs are often in the position of communicating the first positive test results to these individuals. Furthermore, aging HIV-infected individuals are requiring primary care over longer periods of time, particularly with respect to their risks of a number of long term “non-AIDS” complications, including cardiovascular and cerebrovascular disease, neurocognitive decline and selected malignancies.

HIV in Western Australia

Notifications to the WA Health department of newly diagnosed HIV infections first peaked in 1986, and reflected infections likely to have been acquired over a number of preceding years. The annual rate of new cases subsequently declined until the year 2000, but since then, the numbers have steadily increased each year, with a new peak established in 2010, exceeding that of 1986 (Figure 1) (1). In contrast to the first two decades since the start of the epidemic, and unlike any other state in Australia, heterosexual transmission has increased to become the most common exposure category (57% of cases in 2010) exceeding transmissions among men who have sex with men (MSM) (35%) in WA (2).

Among both men and women, heterosexually transmitted infections acquired in high prevalence countries, predominantly in Asia and Sub-Saharan Africa have contributed to this rise in annual notifications.

HIV natural history and the effects of treatment

HIV specifically targets T lymphocytes bearing the CD4 molecule on their surface in the lymph nodes, small bowel lymphoid tissue and blood, and therefore the CD4 T cell count measured by flow cytometry is a marker of immune depletion. The CD4 T cell count correlates with the degree of vulnerability to a relatively narrow set of opportunistic pathogens (Figure 2). The one to ten weeks after transmission may be asymptomatic or associated with a mononucleosis-like seroconversion illness corresponding to the host mounting an immune response to infection.

Research in recent years has shown that early destruction of Peyers patches in the ileum during this time plays a major role in activating the immune system and accelerating the loss of peripheral CD4 T cells (3). Though HIV antibodies are always produced and are measured in diagnostic HIV tests, they do not clear the virus in-vivo. The levels of HIV replication in the blood may be variably controlled by the host’s cellular immune response thereafter but in almost all individuals, HIV will eventually overcome host immunity and cause AIDS over a median of 10 years if untreated.
Although the optimal timing of treatment initiation is a subject of ongoing studies, treatment is currently recommended to individuals once their CD4 T cell count falls to 350 cells/µL and at higher levels than this under certain circumstances.

A combination of agents over two to four main drug classes are used and are now available as convenient, once daily or twice daily regimens which will be tolerated by the majority of patients. One of the most commonly prescribed first regimens to patients in WA is a single tablet co-formulation taken once a day.

The majority (~80%) of patients will achieve such potent and sustained suppression of HIV replication with these drugs, that the virus will become undetectable in their blood using current standard assays and will remain so for years.

**Role of the GP and primary care**

Table 1 indicates the circumstances that should prompt HIV testing among patients presenting to their GPs. In the event of a result indicating HIV infection, the quality of the initial disclosure can often greatly influence the patient’s subsequent attitudes to medical services and their likelihood of adhering to treatment, safe behaviours and general health advice. It is now possible to be optimistic about the prognosis associated with HIV infection in the newly diagnosed patient, provided they can access standard of care treatment. Accurate information and reassurance at this early point can promote a sense of self-efficacy and internal locus of control, both of which are associated with better outcome in the long term. This will be especially important for the increasing number of patients born in high prevalence countries who may still fear the stigma associated with HIV infection as well as assume a descent into AIDS and death is inevitable, as is indeed the case for many in their countries of birth.

The care of the treated HIV-infected patient is now a long term endeavour, with individuals living and working in the community and increasingly focused on preventative health measures against chronic prevalent diseases. It is now recognized that the immune activation associated with HIV infection contributes to chronic vascular disease and persistent immune dysfunctions increase the risk of some cancers. Antiretroviral treatment reduces the incidence of these “non-AIDS” complications by reducing immune activation and allowing immune restoration. While HIV treatment prescription and advice in WA is delivered largely by metropolitan specialist clinics and a small number of S100 GP prescribers, the GP can contribute to the preventative health care interventions that they deliver for many others in their practices, such as monitoring and figure showing the natural history of immune decline and effect of treatment.

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**Figure 2. Natural history of immune decline and effect of treatment**

- CD4 T cell count
- Primary HIV Infection
- Antiretroviral therapy
- PCP, Kaposis sarcoma
- Mucosal candidiasis
- Seborrhoeic dermatitis, HSV, HPV, VZV
- Molluscum contagiosum
- TB, Strep pneumonia
- Cryptococcosis
- Cryptosporidium
- Toxoplasmosis
- PML, CMV, MAC, CNS lymphoma

10 weeks | 5 years | 10 years
treating nicotine addiction, dyslipidemia, hypertension, diabetes and obesity. The use of Framingham or similar cardiovascular risk calculations and targets for good control of all of these conditions in HIV infected individuals are no different to those recommended for the general population. Lifestyle modification advice and most pharmacologic therapies for these conditions are also no different, though some lipid lowering drugs have specific, well documented interactions with some antiretroviral drugs. Screening for human papilloma virus (HPV) infection and associated malignancies are also important in the long term care of women and men with HIV infection. As with other chronic diseases, HIV infection is most successfully managed when there is an individualised management plan with good communication between specialist and GP and which engages the patient as much as possible in their own health monitoring and lifestyle modification.

Information resources are available for health providers and patients (given below), and a GP mentorship program directed by the Australian Society of HIV Medicine (ASHM) is now offered to all GPs in WA who have requested HIV serology on a patient which subsequently confirms a new case of HIV infection.

WA Specialist clinical services

Royal Perth Hospital
Department of Clinical Immunology
Wellington Street Campus
Wellington Street, Perth WA 6000
T: 08 9224 2899

Fremantle Hospital
Infectious Diseases (B2 Clinic)
Level 2, B Block, Alma Street
Fremantle WA 6160
T: 08 9431 2149

Other useful resources

Australasian Society for HIV Medicine (ASHM)
T: 02 8204 0700
E: ashm@ashm.org.au
W: www.ashm.org.au

The Western Australian AIDS Council (WAAC)
W: www.waaids.com

Department of Health: Public Health
W: www.public.health.wa.gov.au

Table 1 – HIV antibody testing is indicated in the following circumstances:

- Patient request
- Identification of clinical signs or symptoms
- Identification of risk factors in the patient history
- Unprotected sexual contact in MSM
- Sharing of intravenous drug use injecting equipment.
- Being the sexual partner of a person with HIV infection
- Being from a country or region with a high HIV prevalence, e.g. Sub-Saharan Africa, South East Asia, Papua New Guinea, the Caribbean
- Recently overseas travel with unprotected sex, injecting drugs and medical procedures
- Part of a screening process, e.g. pregnancy
- Presentation for post-exposure prophylaxis after occupational or non-occupational exposure to HIV
- Diagnosis of another sexually transmitted infection (other infections, especially if ulcerative, place individuals at increased risk of acquiring HIV)

References
1. The Epidemiology of Notifiable Sexually Transmitted Infections and Blood-Borne Viruses in Western Australia 2009. Eds (Kellie Kwan, Donna Mak and Byron Minas). Communicable Disease Control Directorate, Department of Health, Western Australia. P 42-7.
2. Quarterly Surveillance Report of Notifiable STIs & BBVs in Western Australia (2010). Epidemiology & Surveillance Program, Communicable Disease Control Directorate, Department of Health, Western Australia. Eds (Kellie Kwan and Byron Minas). Vol. 8 (1):8-10

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