Infection prevention

Preventing the spread of HIV infection

In this article...

› HIV prevalence statistics
› Methods for preventing HIV
› The use of HIV treatment to prevent infection spreading

Author
Nicky Perry is lead clinical research nurse and manager HIV/GUM, Brighton and Sussex University Hospitals Trust.

Abstract

Approximately 96,000 people are living with HIV in the UK, a quarter of whom are unaware they are infected. While in some parts of the world the number of people newly infected with HIV has fallen, in the UK in 2011 there was a rise in the number of men who have sex with men being diagnosed. HIV prevention strategies are a public health priority, while ongoing research into HIV testing in all clinical settings remains a priority.

This article explores preventive measures that can be used to reduce the spread of HIV and offers advice on how nurses can contribute to these.

More than 34 million people worldwide were living with HIV at the end of 2011. An estimated 0.8% of adults aged 15-49 years worldwide have the infection, although the burden of the epidemic continues to vary considerably between countries and regions (Joint United Nations Programme on HIV/AIDS, 2012). The number of people newly infected is continuing to fall: the overall number worldwide acquiring HIV infection in 2011 (estimated at 2.5 million) was 20% lower than in 2001 (Joint United Nations Programme on HIV/AIDS, 2012).

HIV in the UK
An estimated 96,000 people were living with HIV in the UK by the end of 2011, an increase from 91,500 in 2010; a quarter of them are unaware they are infected. In 2011, 6,280 people were newly diagnosed.

While this is a decline from the peak in 2005, the decrease is largely due to a reduction in the number of diagnoses reported among people born outside the UK. New diagnoses among men who have sex with men (MSM) have been increasing since 2007, with 3,010 reports in 2011, representing an all-time high (Health Protection Agency, 2012). However, Aids diagnosis and deaths among people with HIV have continued to decline since 1998 (Figs 1 and 2).

Since the introduction of highly active antiretroviral therapy (HAART) in the late 1990s, HIV has been transformed from a fatal illness into a manageable long-term condition, provided that people are tested and diagnosed early enough and have access to treatment and care. Today, those who are diagnosed early in the course of infection have an excellent prognosis, with life expectancy approaching that of the general population. People with undetectable viral loads (HIV below the levels of detection) who achieve a CD4 count of 350 cells/mm³ or above within a year of starting HAART are predicted to have a normal life-expectancy (May et al, 2012).

The decline of HIV and Aids-related mortality, along with continuing high levels of new infections, has resulted in an increase in the prevalence of the infection, and, since treatment is lifelong, an increase in NHS costs. Estimated treatment and care costs in the UK were £176m in 2010 and the average lifetime cost of treating HIV infection is estimated to be between £280,000 and £360,000 (HPA, 2012). These costs alone mean it is critical to reduce the incidence of HIV infection;
HIV Association guidelines recommend an HIV test at the first presentation as well. This offers the opportunity to discuss other means of HIV prevention (Benn, 2011).

One problem associated with PEP or PEPSE is that completion rates can be low due to side-effects of the medications. Research studies are under way to evaluate more tolerable regimens and to develop behavioural interventions to reduce risk behaviour in MSM.

Pre-exposure prophylaxis
Research is ongoing into the penetration of antiretroviral drugs into the male and female genital tracts, and the protective effects of oral or topical (microbicide) pre-exposure drugs. The first results were reported in the CAPRISA study undertaken in South Africa; 889 high-risk women used an applicator that delivered 1% tenofovir gel into the vagina up to 12 hours before and within 12 hours after intercourse. The study reported a 39% reduction in overall acquisition of HIV, 28-day course of antiretroviral medications; it can also be used following sexual exposure (PEPSE).

Treatment should be started within 72 hours of exposure, and is more effective the earlier it is commenced. The use of PEPSE is outlined in the UK guidelines for prevention of HIV following sexual behaviour (Benn, 2011). All recommendations are for either unprotected sexual exposure or where condom failure has occurred.

PEPSE is not indicated if the “source” is on antiretroviral therapy and the viral load is below the level of detection, unless the person presenting has had unprotected receptive anal intercourse (URAI); this is because the risk of transmission of HIV has been found to be low in this circumstance. However, this information is not always known or available.

HIV testing is performed three months after the 28-day PEP course. The British

HIV prevention
Approaches to HIV prevention are often talked about as “combination prevention” – one size does not fit all and various methods have been and are currently being researched (Fig 3). Commonly used HIV prevention interventions are discussed below.

Condoms
The only universal medically proven method for preventing the spread of HIV during sexual intercourse is the correct use of condoms. Condoms are the only method promoted by health organisations worldwide.

Circumcision
In sub-Saharan Africa, circumcision has been found to reduce the risk of HIV infection in heterosexual men by 38-66% over two years (Siegfried, 2009). The World Health Organization and UNAIDS have both recommended male circumcision as a method of preventing female-to-male transmission (WHO, 2007). At present, it is unclear whether circumcision is of benefit among men who have sex with men.

Post-exposure prophylaxis
Post-exposure prophylaxis (PEP) is standard care following risk of occupational exposure to HIV and involves a
and a maximum reduction of 54% in the most adherent women (Abdool et al, 2010).

Other studies with oral antiretroviral agents are ongoing. In the iPrEx study in 2010, HIV-negative MSM were given one tablet daily (tenofovir plus emtricitabine) for between two and eight years. The study recorded a 44% reduction in HIV acquisition and, as with CAPRISSA, efficacy was strongly associated with blood concentrations of the antiretrovirals, which is a direct marker of adherence (Grant et al, 2010).

In contrast, the FEM-PrEP trial offered to high-risk women was discontinued because an equal number of infections occurred in both the placebo and treatment groups (Padian et al, 2011). The reason for this is unknown; it may be due to insufficient concentrations of the drugs in the genital tract to prevent HIV. Recommendations of wide-scale promotion for women would be premature while studies are continuing.

The UK position on HIV prevention

Following the results of the iPrEx study, there was a call to make pre-exposure prophylaxis (PrEP) available for MSM reporting “high risk” sexual exposure. The British HIV Association (BHIVA) and British Association for Sexual Health and HIV (BASHH) position statement on PrEP states that “the momentum following these clinical trials creates the opportunity to rethink our overall strategy for HIV prevention at a time when the NHS is undergoing change” (McCormack et al, 2012).

The report goes on to recommend that ad hoc prescribing should be avoided and that PrEP should only be prescribed in the context of a clinical research study in the UK. A randomised controlled trial in MSM has started recruiting in the UK. The PROUD study will compare immediate versus deferred initiation of daily tenofovir plus emtricitabine in MSM who report unprotected intercourse (www.proud.mrc.ac.uk).

Treatment as prevention

Treatment as prevention (TasP) describes the public health or community benefits derived from the use of antiretroviral medication to decrease the transmission of HIV. The treatment works by reducing the viral load, thereby reducing infectiousness.

Five observational reports noted a substantial reduction in HIV transmission to a sexual partner when the person with HIV was given antiretroviral drugs. The HTPN 052 study is a randomised controlled trial examining the ability of antiretrovirals to interrupt HIV transmission from people with HIV to their sexual partners. Findings from the study show a 96% reduction in HIV transmission attributed to the use of antiretroviral drugs (National Institute of Allergy and Infectious Diseases, 2011).

On a global front, guidelines for HIV treatment support starting antiretroviral therapy early (WHO, 2009), which also favour the public health potential of this approach. The HPTN 052 trial has bridged a crucial gap by showing that TasP is effective.

However, despite this evidence and considerable international discussion in academic papers, publications, official statements and conferences, the HIV sector in the UK had not issued any guidance on TasP.

The Swiss Federal Commission for HIV/AIDS made the first definitive statement to offer advice on the impact of treatment on transmission between serodiscordant couples (couples where one partner is HIV positive and the other is HIV negative): “An HIV-infected person on antiretroviral therapy with completely suppressed viremia (‘effective ART’) is not sexually infectious, that is cannot transmit HIV through sexual contact” (Vernazza et al, 2008).

The statement specified that this is valid provided that:

- The person adheres to antiretroviral therapy, the effects of which must be evaluated regularly by the treating physician;
- The viral load has been suppressed below the limits of detection (below 40 copies/ml) for at least six months;
- There are no other sexually transmitted infections (STIs).

The UK position on TasP

The British HIV Association (BHIVA) and the Expert Advisory Group on AIDS (EAGA) recently published a position statement on the use of antiretroviral therapy to reduce transmission (Fidler et al, 2013). This notes that the published data is derived largely from heterosexual couples and there is insufficient data to conclude that antiretroviral therapy can provide similar levels of protection in relation to other sexual practices, including unprotected anal intercourse between men or between men and women. However, it is generally accepted by HIV specialists that an extremely low risk of transmission can also be anticipated for these practices, providing the same conditions are met as outlined above.

The statement goes on to recommend that health professionals discuss the impact of antiretroviral therapy on the risk of viral transmission to sexual partners with all people under their care who are living with HIV. These discussions should establish that there is no evidence of coercion and the person with HIV infection must be fully informed of the need to commit to long-term adherence to the therapy, frequent STI screening and regular viral load measurements, and be made aware of the potential side-effects of therapy.

BHIVA guidelines on the treatment of HIV-positive adults with antiretroviral therapy also recommend that the evidence showing treatment with antiretroviral therapy lowers the risk of transmission is discussed with all patients. They also recommend that an assessment of the current risk of transmission to others is made.
when commencing antiretroviral therapy. If a patient with a CD4 count above 350 cells a wish to start the therapy to reduce the risk of transmission to partners, this decision should be respected and therapy started (BHIVA, 2012). The National HIV Nurses Association (NHIVNA) is carrying out a survey to assess what skills and knowledge nurses working with people with HIV need to be able to assess and discuss TasP with patients.

The House of Lords Select Committee on HIV and AIDS (2011) recommended that, in developing a new prevention policy better testing is a priority. New efforts need to be made to diagnose those infected as early as possible.

HIV testing

Antenatal HIV testing is now provided on an “opt-out” basis, meaning it is carried out automatically unless a woman declines the offer; this has been a significant success. In 2007 a letter from the UK’s chief medical officer highlighted best practice on offering and recommending (where appropriate) HIV testing in all health settings. The purpose of this is to reduce the proportion of people with undiagnosed HIV infection, with the aim of benefiting both individual and public health (Donaldson, 2007).

In 2008, BHIVA published UK guidelines for HIV testing to help increase HIV testing in all health settings. The guidelines outlined the importance of universal testing, especially in areas of high prevalence in acute general medicine and general practice. They also stated that lengthy pre-test counselling was not required and that all doctors, nurses and midwives should be able to obtain informed consent for an HIV test in the same way that they would for any other medical investigation (BHIVA, 2008).

In a pilot study evaluating the effectiveness of the guidelines, it was found that fewer than 40% of patients admitted via acute general medicine were offered the test, but over 90% of those offered accepted (Perry, 2010). In the anonymised study, not only were high rates of undiagnosed infection found in acute general medicine, but also in other clinical areas where currently HIV testing does not form part of the guidelines, such as orthopaedics and surgery. Of those remaining undiagnosed, the majority would be missed by targeting and identified only by universal testing (Perry, 2010).

Guidance from the National Institute for Health and Clinical Excellence aims to increase HIV testing to help reduce undiagnosed infection and prevent transmission among men who have sex with men by recommending health professionals offer regular, routine testing to all men in high prevalence categories (NICE, 2011). The recommendations include the following:

- Promoting HIV testing among men who have sex with men;
- Primary and secondary care: offering and recommending an HIV test;
- Outreach: providing rapid point-of-care tests.

Conclusion

HIV testing is recognised as a crucial part of almost all programmes for HIV prevention, especially in view of new developments in TasP. Testing can identify people living with HIV/AIDS for the purpose of HIV prevention and care, and can also identify those who are HIV negative, who can then be prioritised for prevention interventions.

Health professionals all have an important role to play, regardless of their area or specialism, in promoting prevention, testing and early treatment of HIV.

References


National Institute of Allergy and Infectious Diseases (2011) Treatment for HIV-infected people with antiretroviral therapy. tinyurl.com/niaids.nih.gov/news


Box 1. Websites

British HIV Association: www.bhiva.org. The British HIV Association offers access to the HIV testing guidelines and other information on the care and management of people with HIV. National AIDS Manual: www.aidsmap.com. NAM works to change lives by sharing information about HIV and AIDS and is a resource for information and updates about HIV. National AIDS Trust: www.nat.org.uk. The trust provides information and help for individuals and organisations so they better understand and meet the needs of people living with HIV. National HIV Nurses Association: www.nhivna.org. The NHIVNA is the main UK professional association for nurses in HIV care. It provides a forum for the dissemination of original nursing research, and addresses nurses’ communication and support needs.