Welcome to the twenty-sixth issue of *HIV This Week*! In this issue, we cover resource needs (leading off in honour of the Technical Support Working Group for UNAIDS’ resource needs estimates which is meeting in Geneva this week!), population movement (migration effects in South Africa), male circumcision (public sector readiness for male circumcision service provision in Soweto), post-exposure prophylaxis (the evidence base), sexual behaviour (HIV perception and condom use in Mozambique; HIV risk in Cairo squatter camps), human resources capacity (Namibia: a diagnostic case study), HIV testing (why you should think again about social venue testing), antiretroviral treatment (paediatric treatment outcomes in Thailand; a head-to-head comparison of 2 class-sparing regimens), monitoring and evaluation (electronic medical records in Rwanda), infant feeding (good outcomes in Abidjan), epidemiology (the heterogeneous epidemic in Vietnam; comparing HIV-1 and HIV-2 in the Gambia), and basic science (the testis as a ‘pharmacological sanctuary’; selenium shows promise).

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Don’t forget that you can find a wealth of information on the HIV epidemic and responses to it at http://www.unaids.org.

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1. Resource needs


In sub-Saharan Africa, 43 million children under the age of 18 have lost one or both parents to AIDS, conflict or other causes. This large number strains systems by which families and communities have traditionally provided care for orphans. Support for some orphans is being provided by a variety of government, community and non-governmental organizations but this assistance reaches only a small percentage of those who need it. Stover and colleagues estimated the funding required for necessary support to those most in need. The authors estimate that US$1-4 billion will be required annually by 2010, depending on whether support is provided to all orphans living below the poverty line or just those in most need. The authors conclude that this is at least four times current funding and should be a priority topic for
HIV prevention funds are often allocated by decision makers at multiple levels. High-level decision makers may allocate funds to regions, and regional decision makers then allocate those funds to specific programmes. Often, funds are allocated proportionally (e.g., in proportion to HIV incidence) rather than efficiently (i.e., to maximise HIV infections averted). Zaric and Brandeau investigate the impact of efficient and proportional allocation methods at two different decision levels. The authors developed an optimisation model of resource allocation at two levels - an aggregate upper level and multiple local levels - and considered efficient allocation and allocation proportional to HIV incidence. Using data from 40 U.S. states, they compared 4 strategies for allocating HIV prevention funds. The greatest health benefit (HIV infections averted) occurred when efficient allocations were made at both levels. When funds were allocated proportionally at the higher level and efficiently at the lower level, the health benefit was about 5% less than when efficient allocations were made at both levels. When funds were allocated efficiently at the higher level and proportionally at the lower level, the health benefit was 15% less than when efficient allocations were made at both levels. The least health benefit (23% less than when efficient allocations were made at both levels) occurred with proportional allocation at both levels. The authors conclude that efficient allocation only at the higher level cannot overcome poor allocations at lower levels. Moreover, efficient allocation at the lower level is likely to yield greater gains than efficient allocation at the higher level. Thus, upper-level decision makers, such as donor organizations, should develop incentives to promote efficient allocation by lower-level decision makers. Editors' note: Incentives to promote efficient allocation by lower-level decision makers need to be supplemented by training on how to make decisions about prevention programming to maximise HIV infections averted. Understanding where the last thousand infections have occurred can help design programming tailored to have maximum effect.


Limited resources, whether public or private, demand prioritisation among competing needs to maximise productivity. With a substantial increase in the number of reported HIV cases, little work has been done to understand how resources have been distributed and what factors may have influenced allocation within the newly introduced Enhanced National AIDS Control Program of Pakistan. Husain and colleagues identified perceptions of decision makers about the process of resource allocation within Pakistan's Enhanced National AIDS Control Program. A qualitative study was undertaken and in-depth interviews of decision makers at provincial and federal levels responsible to allocate resources within the program were conducted. HIV was not considered a priority issue by all study participants and external funding for the programme was thought to have been accepted because of poor foreign currency reserves and donor agency influence rather than local need. Political influences from the federal government
and donor agencies were thought to manipulate distribution of funds within the programme. These influences were thought to occur despite the existence of a well-laid out procedure to determine allocation of public resources. Lack of collaboration among departments involved in decision making, a pervasive lack of technical expertise, paucity of information, and an atmosphere of ad hoc decision making were thought to reduce resistance to external pressures. The authors conclude that development of a unified programme vision through a consultative process and advocacy is necessary to understand goals to be achieved, to enhance programme ownership and develop consensus about how money and effort should be directed. Enhancing public sector expertise in planning and budgeting is essential not just for the programme, but also to reduce reliance on external agencies for technical support. Strengthening available databases for effective decision making is required to make financial allocations based on real, rather than perceived needs. With a large part of HIV programme funding dedicated to public-private partnerships, it becomes imperative to develop public sector capacity to administer contracts, coordinate and monitor activities of the non-governmental sector. Editors' note: As this assessment demonstrates, not only information and data inputs, but also the decision-making environment and available budgeting and planning skill sets, influence the likelihood of effective decision-making on financial allocations.

2. Population movement and HIV


Coffee and colleagues designed a deterministic mathematical model to evaluate the dynamic interactions between mobility, sexual behaviour, HIV, and sexually transmitted infections. The model was based on a population study of 488 adults, which included male migrants, male non-migrants and their rural partners in KwaZulu/Natal, South Africa. The model predicted that the impact of migration depends upon the epidemic’s stage and the pattern of migration. Early in the epidemic, frequent migration between populations with different HIV prevalence rates accelerated HIV spread; however, local sexual risk behaviour determined the eventual scale of the epidemic. If migration is coupled with increased sexual risk behaviour by migrant men, as has been reported in the South African communities studied, HIV prevalence would increase 10 times among migrants' female partners (1.8 to 19%). In contrast, if migration were to occur infrequently, with migration-associated risk behaviour assumed to be at current levels, the predicted epidemic would be one fifth that currently observed (2.8 versus 15.1%). The authors conclude that migration primarily influences HIV spread by increasing high-risk sexual behaviour, rather than by connecting areas of low and high risk. Frequent return of migrants is a important risk factor when coupled with increased sexual risk behaviour. Accordingly, intervention programmes in South Africa need to target the sexual behaviour of short-term migrants specifically, even though these individuals may be more difficult to identify. Editors' note: It is not migration per se but sexual risk behaviour that influences the level of the epidemic. Recreational programmes for migrant workers, housing and services for families, and HIV-specific migrant programmes promoting safer sex can help prevent HIV transmission.

3. Male circumcision
http://www.implementationscience.com/content/2/1/2

De Bruyn examined the public sector delivery of male circumcision in the only public sector hospital in Soweto, South Africa, to gauge local capacity to deliver this procedure as an intervention for prevention of HIV acquisition. During the period from July 1998 to March 2006, approximately 360 procedures were performed per annum with striking seasonal variations. The authors conclude that the relatively few procedures performed may create challenges for programme planning, if male circumcision is increased to a level required to have an impact on the incidence of HIV among this population. Editors' note: This is among the first published assessments of public sector readiness to increase access to male circumcision services. The WHO/UNAIDS consultation on the policy and programming implications of the results of three randomised controlled trials, which demonstrated a halving of the risk of HIV acquisition in adult men who became circumcised, takes place in Montreux, Switzerland 6-8 March. Guidance to countries, particularly those with areas of high HIV prevalence and low male circumcision levels, will be formulated. The results of rapid assessments of local capacity to deliver services will be among the factors influencing subsequent decision-making in countries.

4. Post-exposure prophylaxis

http://www.mrw.interscience.wiley.com/cochrane/clsysrev/articles/CD002835/frame.html

Populations such as healthcare workers, people who inject drugs, and people engaging in unprotected sex are all at risk of being infected with HIV. Animal models show that after initial exposure, HIV replicates within dendritic cells of the skin and mucosa before spreading through lymphatic vessels and developing into a systemic infection. This delay in systemic spread leaves a “window of opportunity” for post-exposure prophylaxis (PEP) using antiretroviral drugs designed to block replication of HIV. PEP aims to inhibit the replication of the initial inoculum of virus and thereby prevent establishment of chronic HIV infection. Young and colleagues evaluated the effects of antiretroviral PEP post-occupational exposure to HIV. The authors searched the Cochrane Central Register of Controlled Trials, Medline, Embase, AIDSearch, and the Database of Abstracts of Reviews of Effectiveness for studies published by May 2005. No randomized controlled trials were identified which assessed the effect of PEP on HIV seroconversion. Only one case-control study was included. HIV transmission was significantly associated with deep injury (OR 15, 95%CI 6.0-41), visible blood on the device (OR 6.2, 95%CI 2.2-21), procedures involving a needle placed in the source patient’s blood vessel (OR 4.3, 95%CI 1.7-12), and terminal illness in the source patient (OR 5.6, 95%CI 2.0-16.0). After controlling for these risk factors, no differences were detected in the rates at which cases and controls were offered post-exposure prophylaxis with zidovudine. However, cases had significantly lower odds of having taken zidovudine after exposure compared to controls (OR 0.19, 95%CI 0.06-0.52). No studies were found that evaluated the effect of two or more antiretroviral drugs for occupational PEP. Eight reports from observational comparative studies confirmed findings that adverse events were higher with a three-drug regimen, especially one containing indinavir. However, discontinuation rates were not
significantly different. The authors conclude that the use of occupational post-exposure prophylaxis is based on limited direct evidence of effect. However, it is highly unlikely that a definitive placebo-controlled trial will ever be conducted, and, therefore, on the basis of results from a single case-control study, a four-week regimen of post-exposure prophylaxis should be initiated as soon as possible after exposure, depending on the risk of seroconversion. There is no direct evidence to support the use of multi-drug antiretroviral regimens following occupational exposure to HIV. However, due to the success of combination therapies in treating HIV-infected individuals, a combination of antiretroviral drugs should be used for post-exposure prophylaxis. Healthcare workers should be counselled about expected adverse events and the strategies for managing these. They should also be advised that PEP is not 100% effective in preventing HIV seroconversion. A randomized controlled clinical trial is neither ethical nor practical. Due to the low risk of HIV seroconversion, a very large sample size would be required to have enough power to show an effect. More rigorous evaluation of adverse events, especially in the developing world, are required. Editors' note: Post-exposure prophylaxis with combination antiretroviral regimens should be initiated rapidly for deep injuries with an open bore needle that has just left a terminal patient's blood vessel with visible blood. Although completion rates for a four-week course can be low due to side effects, and the true efficacy of PEP will likely never be known, knowledge of the availability of PEP can have a major effect on health care worker job retention and satisfaction.

5. Sexual behaviour


The relationship between individuals' perception of their risk for acquiring HIV and their use of condoms is poorly understood. Understanding this relationship is crucial to the development of effective strategies to fight HIV. Prata and colleagues used data from the Mozambique 2001 Adolescent and Young Adult Reproductive Health and Behavior Risk Survey to compare 15-24-year-olds' assessments of their HIV risk with assessments based on current and past sexual behaviour. The authors used bivariate and probit regression analyses to examine the relationship between correct risk assessment and the likelihood of condom use at last intercourse. Twenty-seven percent of women and 80% of men who considered themselves to have no risk or a small risk of contracting HIV were actually at moderate or high risk. For both men and women, the prevalence of condom use at last sex was more than twice as high among those who assessed their risk correctly (30% and 16%, respectively) as among those who did not (14% and 6%). Multivariate analysis showed that correct assessment was positively associated with condom use; the association was driven by use among never-married individuals. Never-married males who assessed their risk correctly were 18% more likely than other males to report condom use; never-married females, 17% more likely than other females. The authors conclude that educational messages should aim at enabling individuals to correctly assess their own HIV risk and encouraging behaviour change based on self-assessment of risk. Editors' note: Overcoming denial of one's own risk is the first step toward making changes to avoid or reduce risk. These condom use rates seem very low but the trend in 2001 was in the right direction.

Shama and colleagues assessed HIV and AIDS perceptions and risky behaviours of adults living in squatter areas in order to take decisions about the relevant messages and health education methods that should be used to prevent HIV transmission. Two methods were used to collect data in this cross sectional study, focus group discussion and structured interview. The study was carried out in six squatter areas in Cairo, four of them located in west Cairo and two in east Cairo. Two hundred and thirty seven community members and community leaders shared in the study, 44.7% were males and 55.3% females, 64.1% were married and 34% single. Community members represented two-thirds of the sample while one-third was community leaders. Participants expressed strong eagerness to know more about HIV and AIDS. Poor knowledge and misconception about HIV and AIDS were remarkable. The study revealed several misconceptions regarding modes of transmission and preventive measures that could be used to protect oneself from HIV. Heterosexual extramarital relationships and intravenous drug transmission were the HIV risky behaviours considered to be prevalent in these communities. HIV risky behaviours appear to be more prevalent in the four squatter areas in west Cairo than in the two squatter areas located in east Cairo. Adolescents were considered at high risk of contracting HIV because of the risky behaviours they practice. Social non-acceptance of women who practice HIV risky behaviours is much stronger than non-acceptance of men who practice the same risky behaviours. Television movies were the main source of information about HIV. Parents played no role in providing adolescents with information about HIV. The possible role of teachers in HIV education is unclear because of the negative attitude of people towards teachers.

6. Human resources capacity


McCourt and Awases address an important practical challenge to staff management. In 2000 the United Nations committed themselves to the ambitious targets embodied in the Millennium Development Goals (MDGs). Only five years later, it was clear that poor countries were not on track to achieve them. It was also clear that achieving the three out of the eight MDGs that concern health would only be possible if the appropriate human resources were in place. The authors used a case study based on semi-structured interview data to explore the steps that Namibia, a country facing severe health problems that include an alarmingly high HIV infection rate, has taken to manage its health workers. In the 15 years since independence, Namibia has patiently built up a relatively good strategic framework for health policy in the context of government policy as a whole, including strong training arrangements at every level of health staffing, and it has brought HIV under the strategic umbrella through its National Strategic Plan for HIV and AIDS. Its major weakness is that it has not kept pace with the rise in HIV and TB infection: the community counselling service, still at the pilot stage at the time of this study, was the only specific response. That has created a tension between building long-term capacity in a strategic context and responding to the short-term demands of the AIDS and TB crisis, which in turn affects the ability of human resources to contribute to improving health outcomes. The authors conclude that it is suggested that countries like Namibia need a new paradigm for staffing their health services. Building on the existing strategic framework, it
should target the training of 'mid-level cadres'. Higher-level cadres should take on the role of supporting and monitoring the mid-level cadres. To do that, they will need management training and a performance management framework for staff support and monitoring.

7. HIV testing

Prost A, Chopin M, McOwan A, Elam G, Dodds J, Macdonald N, Imrie J. "There is such a thing as asking for trouble": taking rapid HIV testing to gay venues is fraught with challenges. *Sex Transm Infect* 2007 Jan 17 [Epub ahead of print]. [http://sti.bmj.com/cgi/rapidpdf/sti.2006.023341v1](http://sti.bmj.com/cgi/rapidpdf/sti.2006.023341v1)

Prost and colleagues explored the feasibility and acceptability of offering rapid HIV testing to men who have sex with men in gay social venues using a qualitative study with depth interviews and focus group discussions. The authors analysed interview transcripts for recurrent themes. A total of twenty-four respondents participated in the study. Six gay venue owners, four gay service users, and one service provider took part in depth interviews. Focus groups were conducted with eight members of a rapid HIV testing clinic staff and five positive gay men. Respondents had strong concerns about confidentiality and privacy, and many felt that HIV testing was 'too serious' an event to be undertaken in social venues. The majority also voiced concerns about issues relating to post-test support and behaviour, and clinical standards. Venue owners also discussed the potential negative impact of HIV testing on social venues. The authors conclude that there are currently substantial barriers to offering rapid HIV tests to men who have sex with men in social venues. Further work to enhance acceptability must consider ways of increasing the confidentiality and professionalism of testing services, designing appropriate pre and post-discussion protocols, evaluating different models of service delivery, and considering their cost-effectiveness in relation to existing services. **Editors’ note:** It is unclear whether there is demand for social venue HIV testing among men who have sex with men in the first place. Without such knowledge, trying to find ways to reduce barriers seems premature.

8. Antiretroviral treatment


Paediatric antiretroviral therapy programmes have recently been implemented in resource-limited settings. Their impact in a prospective cohort is not well documented. Puthanakit and colleagues evaluated the rates and causes of hospitalization and mortality among HIV-infected Thai children after receiving antiretroviral therapy. Children who started receiving ART from August 2002 to March 2005 were prospectively observed. The patients included in the study were antiretroviral-naive HIV-infected children who had CD4 cell percentages of 15% or less before treatment. All patients were observed for at least 48 weeks. One hundred ninety-two children were included. The mean age at ART initiation was 7.6 years (range, 0.4-14.8 years). At baseline, the mean CD4 cell percentage (+/-SD) was 5.2%+/-4.9%, and the mean plasma HIV RNA level was 5.4+/-0.5 log(10) copies/mL. Sixty-seven children (35%) were hospitalized a total of 108 times. The hospitalization rate decreased from 30.7% during the first 24-week period to 2.0% during weeks 120-144 after initiation of ART. Fifty-nine hospital admissions (54.6%) occurred during the first 24 weeks of ART. Causes of hospitalization were pneumonia and other bacterial infections (61.7%), immune reconstitution syndrome (23.4%), noninfectious illness (6.5%), opportunistic infection (5.6%), and drug-related events (2.8%). The mortality
rate decreased from 5.7% in the first 24 weeks to 0%-0.6% in the subsequent 24-week interval. The authors conclude that hospitalization and mortality rates significantly decreased among HIV-infected children receiving ART. Most hospitalizations and deaths occurred during the first 24 weeks of ART. Editors' note: Once again, we highlight encouraging findings demonstrating greatly decreased hospitalization and mortality rates as a result of paediatric antiretroviral treatment - this time in Thailand.


Complex antiretroviral regimens can be associated with increased toxicity and poor adherence. Fischl and colleagues compared the efficacy and safety of switching to two simplified, class-sparing antiretroviral regimens. The authors conducted a randomized, open-label study in 236 patients with virologic suppression who were taking a three- or four-drug protease inhibitor or non-nucleoside reverse transcriptase inhibitor regimen for at least 18 months. Patients received lopinavir/ritonavir (LPV/r) 533 mg/133 mg twice daily plus efavirenz (EFV) 600 mg once daily or EFV plus two nucleoside reverse transcriptase inhibitors (NRTI). Primary study endpoint was time to first virologic failure (confirmed HIV-1 RNA>200 copies/ml) or discontinuation because of study drug-related toxicity. After 2.1 years of follow up, patients receiving LPV/r plus EFV discontinued treatment at a greater rate than patients receiving EFV plus NRTI (P<0.001). Twenty one patients developed virologic failure (14 receiving LPV/r + EFV and 7 receiving EFV + NRTI) and 26 discontinued because of a study drug-related toxicity (20 receiving LPV/r + EFV and 6 receiving EFV + NRTI). Time to viral failure or study drug-related-toxicity discontinuation was significantly shorter for LPV/r + EFV than EFV + NRTIs (P=0.0015). A significantly higher risk of drug-related toxicity occurred with LPV/r plus EFV, mainly for increased triglycerides (P=0.021). A trend towards a higher virologic failure rate occurred with LPV/r plus EFV in an intent-to-treat and as-treated analyses (P=0.088 and P=0.063 respectively). The authors conclude that switching to EFV plus NRTI resulted in better outcomes, fewer drug-related toxicity discontinuations and a trend to fewer virologic failures compared to switching to LPV/r plus EFV. Editors' note: Reducing pill burden and simplifying antiretroviral regimens to spare a class could trade-off effectiveness. This head-to-head comparison revealed better outcomes and less toxicity for a double NRTI combination with the NNRTI efavirenz than ritonavir-boosted lopinavir with efavirenz. This is encouraging because WHO does not currently recommend protease inhibitors for first line therapy.

9. Monitoring and evaluation


While most people with AIDS do not yet have access to antiretroviral drugs, large antiretroviral treatment (ART) programmes are being rolled out in many areas in sub-Saharan Africa. ART programmes have substantial data management needs which electronic medical record systems are helping to address. While most sophisticated electronic medical record systems in low-income regions are in large cities, where infrastructure and staffing needs are more easily met, Partners In Health has pioneered web-based electronic medical record systems for HIV and TB treatment in rural areas. Allen and colleagues deployed the HIV
electronic medical record system developed in Haiti in two Rwandan health districts starting in August 2005. The authors report that addition of new features and adaptation to local needs is happening concurrently with the rapid scale-up and evolution of the medical programme itself. Editors' note: Electronic medical records, in systems which respect patient confidentiality and ensure record security, are being discussed and implemented in various settings following pilots such as these in operational research programmes.

10. Infant feeding


Little is known about the long-term safety of infant feeding interventions aimed at reducing breast milk HIV transmission in Africa. In 2001-2005, HIV-infected pregnant women having received in Abidjan, Côte d'Ivoire, a peripartum antiretroviral prophylaxis were presented antenatally with infant feeding interventions: either artificial feeding, or exclusive breast-feeding and then early cessation from four months of age. Nutritional counselling and clinical management were provided for two years. Breast-milk substitutes were provided for free. The primary outcome was the occurrence of adverse health outcomes in children, defined as validated morbid events (diarrhoea, acute respiratory infections, or malnutrition) or severe events (hospitalisation or death). Hazards ratios to compare formula-fed versus short-term breast-fed (reference) children were adjusted for confounders (baseline covariates and paediatric HIV status as a time-dependant covariate). The 18-month mortality rates were also compared to those observed in the Ditrame historical trial, which was conducted at the same sites in 1995-1998, and in which long-term breast-feeding was practiced in the absence of any specific infant feeding intervention. Of the 557 live-born children, 262 (47%) were breast-fed for a median of four months, whereas 295 were formula-fed. Over the 2-year follow-up period, 37% of the formula-fed and 34% of the short-term breast-fed children remained free from any adverse health outcome (HR 1.10, 95% CI 0.87-1.38; p = 0.43). The 2-year probability of presenting with a severe event was the same among formula-fed and short-term breast-fed children (14% versus 15%; HR 1.19, 95% CI 0.75-1.91; p = 0.44). An overall 18-month probability of survival of 96% was observed among both HIV-uninfected short-term and formula-fed children, which was similar to the 95% probability observed in the long-term breast-fed ones of the Ditrame trial. In summary, the two-year rates of adverse health outcomes were similar among short-term breast-fed and formula-fed children. Mortality rates did not differ significantly between these two groups and, after adjustment for paediatric HIV status, were similar to those observed among long-term breast-fed children. The authors conclude that given appropriate nutritional counselling and care, access to clean water, and a supply of breast-milk substitutes, these alternatives to prolonged breast-feeding can be safe interventions to prevent mother-to-child transmission of HIV in urban African settings.

11. Epidemiology

Tuan and colleagues studied patterns and determinants of HIV prevalence and risk-behaviour characteristics in different population groups in four border provinces of Viet Nam in April-June 2002. The authors used stratified random-cluster sampling and collected data concomitantly on HIV status and risk behaviours. The groups included were female sex workers (n = 2023), people who inject drugs (n = 1391), unmarried males aged 15-24 years (n = 1885), and different categories of mobile groups (n = 1923). They found marked geographical contrasts in HIV prevalence, particularly among female sex workers (range 0-24%). HIV prevalence among injecting drug users varied at high levels in all provinces (range 4-36%), whereas lower prevalences were found among both unmarried young men (range 0-1.3%) and mobile groups (range 0-2.5%). All groups reported sex with female sex workers. Less than 40% of the female sex workers had used condoms consistently. The strongest determinants of HIV infection among female sex workers were inconsistent condom use (OR 5.3, 95%CI 2.4-11.8), history of injecting drug use and mobility, and among people who inject drugs, sharing of injection equipment (OR 7.3, 95%CI, 2.3-24.0) and sex with non-regular partners (OR 3.4, 95%CI 1.4-8.5). The authors conclude that the finding of marked geographical variation in HIV prevalence underscores the value of understanding local contexts in the prevention of HIV infection. Although lacking support from data from all provinces, there would appear to be a potential for sex work to drive a self-sustaining heterosexual epidemic. That the close links to serious injecting drug use epidemics can have an accelerating effect in increasing the spread of HIV merits further study. Editors' note: This serological and behavioural information gathered from large numbers of people in key populations paints a picture of interlacing epidemic dynamics which vary by geographical location. But now, almost five years later, the picture may have changed. Timely data on epidemic dynamics over shorter time spans and at more frequent intervals can assist decision makers to “know their epidemic” and effectively focus prevention programming.


Although AIDS is less frequent following HIV-2 than HIV-1 infection, it is unclear whether the clinical picture and clinical course of AIDS are similar in the two infections. Martinez-Steele compared the pattern of AIDS-defining events, CD4 cell count at the time of AIDS diagnosis, survival from time of AIDS, and CD4 cell count near time of death in HIV-1 and HIV-2-infected patients. Adult patients with AIDS who attended the clinics of the MRC in The Gambia between 7 May 1997 and 1 July 2003 were enrolled. AIDS was diagnosed according to the expanded WHO case definition for AIDS surveillance (1994). Three hundred and forty-one AIDS patients with HIV-1 and 87 with HIV-2 infection were enrolled. The most common AIDS-defining events in both infections were the wasting syndrome and pulmonary tuberculosis. The median CD4 cell count at AIDS was 109 cells/mul in HIV-1 and 176 in HIV-2 (P=0.01) and remained significantly higher in HIV-2 after adjustment for age and sex (P=0.03). The median time to death was 6.3 months in HIV-1 and 12.6 months in HIV-2-infected patients (P=0.03). In a multivariate analysis controlling for age, sex and CD4 cell count, the mortality rates of HIV-1 and HIV-2-infected patients were similar (P=0.25). The median CD4 cell count near time of death was 62 and 120 cells/mul in HIV-1 and HIV-2-infected patients, respectively (P=0.02). The authors conclude that HIV-2 patients have a higher CD4 cell count at the time of AIDS, and a longer survival after AIDS. The mortality after an AIDS diagnosis is more influenced by CD4 cell count than HIV type.
12. Basic science


Semen represents the main vector for HIV dissemination worldwide and has been shown to harbour replication-competent virus despite otherwise effective highly active anti-retroviral therapy, which achieves undetectable viral load in plasma. Despite this, the origin of seminal HIV particles remains unclear, as does the question of whether the male genital tract organs contribute virus to semen. Roulet and colleagues investigated the presence of HIV receptors within the human testis using immunohistochemistry and quantitative real-time polymerase chain reaction. The authors analysed the infectivity of a dual tropic HIV-1 strain in an organotypic culture, as well as the impact of viral exposure on testosterone production. They establish that CXCR4+, CCR5+, CD4+, and DC-SIGN+ cells are present within the interstitial tissue of human testis and that these molecules persist throughout their organotypic culture. The data also reveal that the human testis is permissive to HIV-1 and supports productive infection, leaving testosterone production apparently unaffected. Infected cells appeared to be testicular macrophages located within the interstitial tissue. The authors conclude that the fact that the testis itself represents a potential source of virus in semen could play a role in preventing viral eradication from semen because this organ constitutes a pharmacological sanctuary for many current antiretrovirals. Editors’ note: Interesting terminology, “pharmacological sanctuary”!


Despite findings that selenium supplementation may improve immune functioning, definitive evidence of its impact on HIV disease severity is lacking. Hurwitz and colleagues evaluated high selenium yeast supplementation (200 µg/d) in a double-blind, randomized, placebo-controlled trial. Intention-to-treat analyses assessed the effect on HIV-1 viral load and CD4 count after 9 months of treatment. Unless otherwise indicated, values are presented as mean ± SD. Of the 450 HIV-1-seropositive men and women who underwent screening, 262 initiated treatment and 174 completed the 9-month follow-up assessment. Mean adherence to study treatment was good (73.0% ± 24.7%) with no related adverse events. The intention-to-treat analyses indicated that the mean change in serum selenium concentration increased significantly in the selenium-treated group and not the placebo-treated group (32.2 ± 24.5 vs 0.5 ± 8.8 µg/L; P<0.001), and greater levels predicted decreased HIV-1 viral load (P<0.02), which predicted increased CD4 count (P<0.04). Findings remained significant after controlling for age, sex, ethnicity, income, education, current and past cocaine and other drug use, HIV symptom classification, antiretroviral medication regimen and adherence, time since HIV diagnosis, and hepatitis C virus co-infection. Follow-up analyses evaluating treatment effectiveness indicated that the non-responding selenium-treated participants whose serum selenium change was less than or equal to 26.1 µg/L displayed poor treatment adherence (56.8% ± 29.8%), HIV-1 viral load elevation (+0.29 ± 1.1 log10 units), and decrease in CD4 count (-25.8 ± 147.4 cells/µL). In contrast, selenium-treated subjects whose serum selenium increase was greater than 26.1 µg/L evidenced excellent treatment adherence (86.2% ± 13.0%), no change in HIV-1 viral load (−
0.04 ± 0.7 log10 units), and an increase in CD4 count (+27.9 ± 150.2 cells/µL). The authors conclude that daily selenium supplementation can suppress the progression of HIV-1 viral burden and provide indirect improvement of CD4 count. The results support the use of selenium as a simple, inexpensive, and safe adjunctive therapy in HIV spectrum disease.

Editors' note: Perhaps we all should be eating more Brazil nuts!

That was HIV This Week, signing off.

Editors' notes on journal access

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