

# Clinical Review

Clinical Review identifies issues in the medical literature of interest to clinicians in Africa. Essential references are given at the end of each section

## STI Review

### STI research in sub-Saharan Africa

A recent review of research on sexually transmitted infections (STIs) finds that many important findings from the past three decades have come from sub-Saharan Africa.<sup>1</sup> Significant research on syndromic management, syphilis, chancroid, herpes, ophthalmia neonatorum, and on the interaction of HIV and other STIs has been conducted in sub-Saharan Africa. Thanks to extensive testing and evaluation of syndromic management protocols, often with World Health Organization (WHO) support, this method of diagnosing and treating patients with symptoms of STIs is practised worldwide. Some of the first studies on the prevention and treatment of STIs among sex workers and their clients took place in Nairobi, Kinshasa, and Adibjan. These showed the feasibility of reducing the incidence of HIV and other STIs among high-risk populations. Numerous studies conducted in sub-Saharan Africa highlighted the importance of pre-existing STIs and the risk of HIV transmission. One reason for this bounty of successful research is the existence of long-term, carefully nurtured international partnerships and collaboration. Working with international partners has significantly improved local capacity for research.

### STI/HIV co-infections

It is well established that STIs are significant risk factors for HIV infection. For those already infected with HIV, subsequent STI co-infection also poses serious health problems. A systematic review of 37 studies on STI co-infections among people living with HIV/AIDS found that the greatest prevalence of co-infections occurs among people newly diagnosed with HIV (19.6%).<sup>2</sup> However, studies show STI co-infections occur throughout the years of HIV infection. A significant proportion of people receiving HIV treatment are also infected with an STI. STI prevalence in the studies reporting participants receiving antiretroviral therapy (ART) was 16.2%, and this prevalence is about the same as among those not receiving ART. HIV treatment has been shown to reduce HIV infectiousness, but co-infection with another STI may impede efforts to reduce HIV transmission. While studies have shown that treating STIs can reduce HIV RNA in the genital tract, there is need for routine STI screening for patients receiving ART. The findings from this review also have implications for mathematical

models that forecast the effects of universal HIV testing and treatment for HIV prevention. Models that do not include the impact of STI co-infections are overly optimistic. This review estimates that the potential for ART to reduce genital tract infectiousness will be impeded for at least 15% of people receiving treatment who contract a new STI. The ongoing epidemic of STI/HIV co-infection undermines the potential benefits of using HIV treatment for prevention.

### Continuing STI education

While healthcare workers in many more developed countries are required to complete continuing education (CE, also known as Continuing Medical Education, CME, or Continuing Professional Development, CPD) to update their knowledge and skills, the opportunities for further education in developing countries, especially outside major urban areas, are limited. One alternative to didactic, classroom-based CE is internet-based CE (I-CE). The rapid expansion in access to the internet (even if not necessarily dependable) makes I-CE an appealing format for professional health education. A recent study from Peru evaluated an interactive I-CE course on STIs management for physicians and midwives.<sup>3</sup> The course focused on syndromic management of STIs and was based on the WHO guidelines for syndromic management of STIs, and on the Peruvian National Guidelines for STD management. Course content addressed four syndromes: vaginal discharge, urethral discharge, pelvic inflammatory disease, and genital ulcer disease. Case scenarios tailored to local STI problems were included for each syndrome. In addition, the course presented an overview of history taking, physical examination and counselling on risky behaviour, and included links to STI resources on the Internet, patient materials, opportunities to 'ask the expert', and responses to frequently asked questions. The course began with a 3-hour workshop for improving internet skills, followed by a 22-hour course and subsequent educational support. Of 642 participants, 510 were private sector clinicians and 132 were public sector. According to pre- and post-tests, physicians' and midwives' scores improved from 64.2% prior to the course to 77.9% 4 months after the course. The majority (95%) of the participants found the course useful for their work, yet self-reported STI management practices did not change. While not a randomised controlled trial, this study shows that an I-CE course is feasible, acceptable, and attracts significant interest among healthcare workers. Creating comprehensive online training centres may be useful for coordinating internet-based curricula between universities, government agencies, and the private sector.

In sub-Saharan Africa, there have been some attempts to make use of the internet to improve education and collaboration in medicine. These are often a mixture of long-distance healthcare delivery (telemedicine) and education. The Pan African eHealth Network, launched in 2009, is a project of the Indian Government, supported by the African Union, which aims to provide telemedicine and tele-education facilities to every African country. The e-education services will be provided from seven universities in India and five

leading universities in Africa. The e-health services for specialist healthcare services in Africa will be provided through 12 hospitals in India and 5 in Africa. Forty-seven African Union countries have signed agreements, and sites in African countries and India are in various stages of developing internet connectivity.<sup>4,5</sup>

**The Réseau en Afrique Francophone pour la Télé-médecine** (RAFT), based at the Geneva University Hospitals in Switzerland, is active in Mali, Mauritania, Morocco, Cameroon, Burkina-Faso, Senegal, Tunisia, Ivory Coast, Madagascar, Niger, Burundi, Congo-Brazzaville, Algeria, Chad, and Benin.<sup>6</sup> The RAFT focuses on webcasting of interactive courses targeted to physicians and other healthcare professionals. About 70% of these courses are now produced and webcast by experts in Africa. Other activities of the RAFT network include teleconsultations, tele-echography, and collaborative development of educational on-line material.

The African Medical and Research Foundation (AMREF) has been using e-learning to upgrade the skills of nurses throughout Kenya.<sup>7</sup> Since 2005, AMREF has partnered with the Nursing Council of Kenya, Accenture (a global management consulting, technology services and outsourcing company), the Kenya Medical Training Colleges, several private nursing schools, and the Ministry of Health to upgrade the skills of Enrolled Community Health Nurses (KECHN). These certificate-level nurses do not have the training required to treat major diseases, such as HIV, TB, and malaria. Because of limited opportunities for classroom-based training for the registered nurses' diploma, only 100 of the 20 000 certificate-level nurses could qualify each year. AMREF and its partners have developed computer-based training modules on General Nursing, Reproductive Health, Community Health, and Specialised Areas. The training, both face-to-face and computer-based, is delivered through 105 computer-equipped eLearning centres set up in eight provinces. To date, more than 5400 nurses have enrolled in the programme, using both print and eLearning modules. AMREF has also recently partnered with the UK-based Open University, a world leader in modern distance learning, to launch the Health Education and Training (HEAT) programme in Africa. This programme aims to train 250 000 Community Health Workers (CHW) over the next 5 years through distance learning modules to increase their skills and capabilities. The HEAT programme is now piloting in Ethiopia, but is ready to be taken to other African countries, and has the flexibility and potential to be adapted for use by midwives, doctors, nurses, and other health workers.

**The E-Learning Certification Programme in Global Health for Africa** is an initiative of the University of Oxford, UK. It seeks to forge partnerships with institutions in Africa to develop an interactive, internet-based education and training programme for health professionals to be delivered in, or close to, the workplace, and alongside healthcare delivery.<sup>8</sup> The programme will include several priority diseases (malaria, HIV/AIDS, TB) as well as knowledge and skills in evidence-based healthcare. The courses will be accredited jointly by students' own institutions as well as the University of

Oxford. The initiative has debuted with a pilot course in malaria designed primarily as a resource for Continuing Medical Education (CME) for junior doctors. This course is supported by the Bill and Melinda Gates Foundation. A report commissioned prior to the design of this initiative provides a comprehensive overview of the status of internet connectivity in Africa (although the data may no longer be current), and some of the problems internet-based communications face on the continent.<sup>9</sup>

The number of web- and internet-based health education projects grows daily, and many are collaborations between individual universities and/or hospitals. For example, the Treatment, Research, and Expert Education (TREE) Distance Learning Portal was established to access live and archived lectures by a US-based University of Washington (UW) faculty as part of the University of Nairobi Institute of Tropical and Infectious Disease (UNITID) Fellowship, but has since expanded to offer access to recorded seminars delivered by leaders in the fields of research and treatment of HIV/AIDS provided courtesy of the University of Washington's Harborview Medical Center Madison Clinic (the largest provider of HIV care in the northwest United States), the UW Center for AIDS Research, and the Northwest AIDS Education and Training Center.<sup>10</sup> TREE also offers international students free access to the University of Washington's graduate level course on Clinical Management of HIV.

**The International Union for Health Promotion and Education** is a decades-old organisation dedicated to improving the health and wellbeing of people worldwide through education, community action, and the development of healthy public policy.<sup>11</sup> While it does not have a regional office in Africa, it does collaborate with local organisations, like AMREF and the Pan African Society of Cardiology (PASCAR). One focus is on developing a comprehensive system for competency-based standards and accreditation to strengthen global capacity in health promotion.

The web- and internet-based information specific to STIs is somewhat limited. The Johns Hopkins Center for Clinical Global Health Education, based in the US, offers a distance learning course called 'Which Tests are Best: An Update on Laboratory Testing for Bacterial STDs'.<sup>12</sup> While this training is oriented to practitioners in the US the information on the various bacterial tests available in the US, along with the advantages and disadvantages of testing for gonorrhoea, chlamydia, syphilis, vaginitis, and trichomonas, are useful to practitioners worldwide.

WHO offers training modules for the syndromic management of sexually transmitted infections.<sup>13</sup> Since these modules are based largely on research done in sub-Saharan Africa (as mentioned in the opening paragraph), they are certainly applicable to local situations.

An intriguing e-learning project on sexual health and HIV is being developed by the British Association for Sexual Health and HIV (BASHH) in collaboration with the Federation of the Royal Colleges of Physicians and the UK Department of Health's e-Learning for Healthcare programme.<sup>14</sup> Launched in May 2010, e-SRH and eHIV-STI include dozens of e-learning sessions

written by subject matter experts. Each session includes self-assessment tools, video clips, case studies, and an extensive library of images. Topics range from 'Approach to Patient' and 'Problem-based Approach to STI Testing' to 'Vaginal Discharge, Vulvitis and Balantitis'. Unfortunately, at this time the modules are only available to UK National Health Service staff. Perhaps in the future, these sessions will be adapted for worldwide audiences and shared through the electronic media that have revolutionised global communication.

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## Medicine Review

### High profile for NCDs?

By the time this article is read by our African audience, the United Nations (UN) will have held their 'High Level Meeting' on non-communicable diseases (NCDs). This is recognition of the importance and seriousness of the growing global threat to morbidity and mortality of NCDs. The meeting is attracting much attention, and a number of groups are pressing for action.<sup>1</sup>

What are NCDs? Essentially, they are anything which is not infective, and include stroke and other neurological disability, cardiovascular diseases, trauma and

road traffic accidents (RTAs), mental health disorders, malignancies, and rheumatological disease. The definition has become increasingly difficult recently, since with modern antiretroviral treatment, HIV/AIDS has essentially become a chronic disease requiring similar approaches to the more classic NCDs.

Any discussions of how to control these diseases need a focus on underlying risk factors. For some (e.g. diabetes, lung disease, hypertension, etc) this involves tobacco use, diet, exercise, and the 'Westernisation' aspects of epidemiological transition and urbanisation. These are difficult issues requiring political initiatives as well as healthcare and cultural change.

Whatever the underlying factors, the basic NCD statistics are of great concern. At present, infective disease causes more deaths than NCDs in tropical countries; but the gap is closing fast and within the next 10 to 15 years it is likely that NCDs will lead the mortality table for Africa and many other areas of the tropics. Already, two-thirds of the world's NCD-related deaths are occurring in the poorest countries.

Many factors are operating in the NCD epidemic. The problems of tobacco, diet, exercise reduction, and urbanisation have been mentioned. But there are other more subtle factors. The increasing effectiveness of treatments for bacterial infections, TB, malaria, and HIV/AIDS has reduced their mortality, allowing patients in tropical countries to live longer. Though this is good news, the downside is that the longer you live, the more likely you are to develop a variety of NCDs – for example type 2 diabetes, hypertension, cancer, osteoarthritis, stroke, and heart failure.

Tropical medicine research has, over the last two decades, quite understandably focused on the major scourges of the tropics – TB, malaria, and HIV/AIDS. Funding for tropical NCD research has been scant, and this needs to be urgently reversed. Delivery of care systems needs to be explored, rationalised, and funded. Political will both nationally and continentally is vital.

The UN summit has the potential to redress the current imbalance between infective and non-infective disease support. Its outcome is very eagerly awaited.

### The end of polio?

The success of smallpox eradication many years ago led to what turned out to be false optimism that many other diseases would soon follow. None has – smallpox is the only disease in which a concerted global eradication campaign has been successful. There are, however, other potential candidates for eradication – in particular leprosy, polio, and guinea worm. In all cases these diseases have greatly declined in numbers, and are now relatively geographically localised. All have their individual problems, and perhaps guinea worm is the current best hope. However, polio has recently been drawn attention to in an independent report of the Global Polio Eradication Initiative (GPEI).<sup>2</sup>

The GPEI was set up as long ago as 1988 by the World Health Organization (WHO) in conjunction with UNICEF, Rotary International, and the Centers for Disease Control and Prevention (CDC),<sup>2,3</sup> also partnered by various governments and the Gates Foundation. An Inde-

pendent Monitoring Board was convened in 2010. They report that between 1988 and 2000, there was a 99% reduction in worldwide polio, but that this has been followed by a 'decade of stalemate', despite expenditure of 800 million dollars per year (£496 million).

The four major polio-endemic countries are Nigeria, India, Pakistan, and Afghanistan. Though progress is continuing in most areas, there have been recent increases in polio in Pakistan and Nigeria. Transmission has also resumed in some countries – for example Chad and Democratic Republic of Congo (DRC).

Overall, eradication in the near future does not seem likely. The independent report recommends heightened disease surveillance and an increase in political will. Nevertheless, eradication at some time is distinctly possible, and efforts are well worth intensifying and increasing.

### Ivermectin for malaria?

A fascinating short report recently appeared in the *American Journal of Tropical Medicine and Hygiene*,<sup>4</sup> and was also featured in the *British Medical Journal*.<sup>5</sup> The report concerned work in Senegal, and was by a collaborative team of researchers from Senegal and the USA. In an area where 'mass drug administration' (MDA) with ivermectin was being carried out to control filariasis and onchocerciasis, an unexpected effect on malaria transmission was noted. The research was sited in a rural area of south-eastern Senegal, and villages where the inhabitants received albendazole MDA were compared with an area about 12 km away where MDA was not given.

The local vector for *Plasmodium falciparum* is *Anopheles gambiae sensu stricto*, and insect samples in the respective areas were caught for 2 weeks after albendazole administration. In the MDA area there was a 79% reduction in *P falciparum*-infected mosquitoes.

Obviously, further studies are needed, but if the effect is confirmed, ivermectin MDA could be a useful addition to current malarial control strategies. The mode of action is presumably a lethal effect of albendazole on the mosquito taking a human blood meal, and this is quite different to other current control methods (e.g. bed nets, spraying, etc). The system may be particularly useful in areas where malaria transmission is mainly in a restricted period of time, such as the rainy season. During this time, ivermectin could perhaps be given monthly to the local population.

Obviously, it is too soon to recommend this form of malaria control, but the observation is an exciting one, and is sure to lead to more widespread and detailed research.

### Hepatitis C in Nigeria

Hepatitis C virus (HCV) is increasingly recognised as a major cause of worldwide chronic liver disease. The disease can be very slowly evolving, with transmission possibly many years before clinical presentation. Little research on HCV in the tropics is available, so a recent study from Nigeria is welcome.<sup>6</sup> From the gastroenterology clinic of Maiduguri University Teaching Hospital, 90 patients with chronic liver disease were selected,

and compared with 85 control patients without liver disease. Anti-HCV antibodies were present in 13/90 (14%) with liver disease, and 2/85 (2%) of those without (a statistically significant difference).

As with other patients with chronic liver disease, those with HCV infection presented typically with hepatomegaly, ascites, and jaundice. Over a third (37%) of patients had a past history of traditional surgery and/or scarification, and 13% had had a past blood transfusion.

Though in most areas of the tropics, hepatitis B (HBV) remains the major cause of viral-associated chronic liver disease, HCV is still an important cause. The Nigerian data suggest that about one in seven of all patients with established chronic liver disease may be HCV-associated. As with HBV, traditional surgery and scarification is an important aetiological factor. Perhaps an important preventive step for the future might be programmes of co-operation and education with traditional practitioners, to encourage sterile techniques and the use of disposable equipment.

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