

MTb

BULLETIN of the NETHERLANDS SOCIETY for TROPICAL MEDICINE and INTERNATIONAL HEALTH

N° 03 / SEPTEMBER 2014 - VOLUME 52

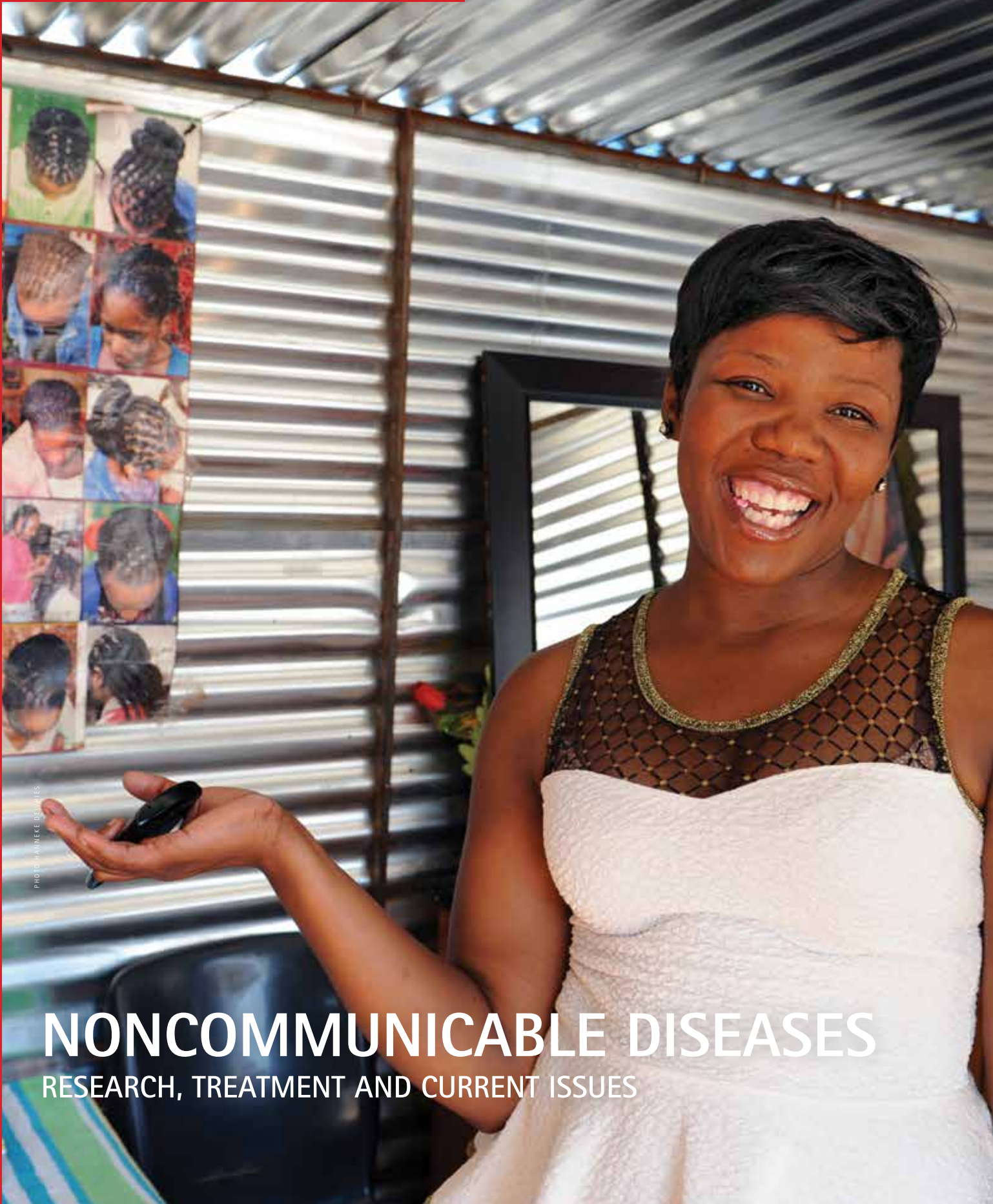


PHOTO: HANNEKE DEJONGES

NONCOMMUNICABLE DISEASES

RESEARCH, TREATMENT AND CURRENT ISSUES



NONCOMMUNICABLE DISEASES: THE NEW EPIDEMIC?

Noncommunicable diseases (NCDs) increasingly contribute to total worldwide mortality (65% in 2010) with 80% of deaths occurring in low- and middle-income countries (LMICs); these are

often premature deaths i.e. before 60 years of age. NCDs are now appearing everywhere in major articles and editorials of leading journals and are on the agenda of most research institutes and funding agencies. In 2011, the second meeting ever organized by the United Nations at the level of Heads of State, was on NCDs (the first one in 2001 was on HIV/AIDS). The UN and WHO, not be deterred from the somewhat embarrassing omission of NCDs from the Millennium Development Goals, have not unexpectedly come up with another slogan: '25 by 25' meaning a 25% reduction in mortality from NCDs among persons between 30-70 years of age, compared to 2010 NCD mortality levels.

Well, it is about time. However, one cannot ignore the feeling that all this prioritizing and media attention is driven by the impact that NCDs have in high income-countries. All tropical doctors know that NCDs in LMICs are part of everyday practice and that there has been an astonishing denial, or inactivity if you will, with regard to NCDs. Hypertension, diabetes, cardiovascular disease, respiratory disease and cancer have always been common. While some of the risk factors are the same (alcohol, tobacco), there are specific risk factors such as rheumatic heart disease, domestic exposure to smoke and common biological agents that can cause cancer such as Epstein-Barr virus (nasopharyngeal carcinoma, malignant lymphoma), hepatitis B virus (hepatocellular carcinoma) and schistosomiasis (bladder cancer). On top of this, compounded by rapid urbanisation, the adoption of an unhealthy (western) life style is alarming, noted by rapidly increasing levels of obesity that is seen as a sign of good health (so not 'slim' as in AIDS) and high economic status ('healthy and wealthy').

More recently introduced tropical diseases increase the risk of NCDs; for example stroke may be caused by infection in HIV disease. Another complex issue is the effect of HIV infection and

subsequent treatment with antiretrovirals that both may cause atherosclerosis. Managing conditions such as diabetes mellitus or hypertension in a LMIC context first requires understanding of underlying mechanisms and collection of essential data. All these are discussed in this issue. Snake bite is somewhat peculiar as it is 'communicable' but not from person to person and not infectious; nevertheless we feel it deserves a place here.

There is limited information on how to treat these conditions in a tropical context taking into account the availability of drugs, response to treatment in genetically different populations, lack of patient education, etc. Prevention and public health measures need more attention in most LMICs. A tailor-made approach based on epidemiological and clinical studies is needed.

What does this mean for us? We should realize that the field of Tropical Medicine is perhaps wider than we often assume; it includes the practice of Medicine (read: Surgery, O&G etc. as appropriate) in a tropical environment and encompasses (among other) infectious diseases, including HIV medicine, community health as well as travel medicine. We should educate ourselves and the public in general about the importance of NCDs and give it a firm place. It would be good to review our teaching in various courses with regard to NCDs such as the training for Doctor in International Health and Tropical medicine (AIGT) as well as our teaching capacity: do we have enough expertise in this field?

THE ERA OF NCDs HAS ARRIVED; NOW WE NEED TO FORMULATE A RESPONSE

ED ZIJLSTRA / E.E.ZIJLSTRA@ROCTM.COM

CONTENT

2 EDITORIAL

3 REVIEW

Hypertension in sub-Saharan Africa, how to address this rising pressure

6

A looming crisis of stroke in sub-Saharan Africa: few countries are prepared

8

PRACTICAL PAPERS

Diabetes mellitus in an African context: the Malawi experience

10

Snakebite, a neglected health problem!

12

Screening for and management of Cardiovascular Risk Factors in the HIV-infected patient

14

CONSULT ONLINE

Non-union of a lower arm fracture

Hypertension in sub-Saharan Africa, how to address this rising pressure



PHOTOS SHUTTERSTOCK

Noncommunicable diseases (NCDs) (predominantly cardiovascular diseases (CVDs), diabetes, cancer and chronic respiratory diseases) are increasingly becoming a looming threat that is creating a double burden in low- and middle-income countries (LMICs). The high-level meeting on NCDs

at the General Assembly of the United Nations in 2011 clearly underscores how NCDs now dominate the health agenda worldwide⁽¹⁾. This is rightly so because more than 60% of preventable deaths worldwide are now attribut-

able to NCDs. In LMICs, 48% of such deaths occur in persons <70 years of age, compared with 26% in high-income countries⁽²⁻⁴⁾. In sub-Saharan Africa (SSA) where infectious diseases are still the overall leading cause of death, the incidence of NCDs is increasing rapidly, a region in which urbanization and population growth are most extreme. In 2008, the age-standardized NCDs mortality rates for all ages were highest in the WHO African Region compared with the overall NCDs age-standardized death rates in LMICs⁽⁴⁾. CVD is the second leading killer overall and the leading cause of death among adults aged 30 years and older, who are in their most productive years of life in SSA⁽⁵⁾.



Hypertension is a major risk factor for CVD and it is increasingly becoming a major health burden in SSA^(5,6). During the first half of the twentieth century hypertension was real in sub-Saharan Africa (SSA), but estimates now show that in some settings in SSA more than 40 percent of adults have hypertension⁽⁷⁾. The estimated 80 million adults with hypertension in SSA in 2000 are projected to rise to 150 million by 2025⁽⁸⁾.

RELEVANT DRIVERS AND IMPLICATIONS

As socio-economic development in SSA societies continues, hypertension is expected to become more prevalent, particularly in urban populations. The increasing prevalence of hypertension and its related sequelae are driven mainly by changes in environmental and behavioural determinants associated with socio-economic development and prolongation of life expectancy. Whereas European and North American populations experienced similar changes in demography, determinants, and disease rates over the course of a century, SSA populations are passing through similar transitions in just a few decades⁽⁹⁾.

A major reason for the increase of hypertension rates in SSA is due to the high urbanization rate. Currently 395 million, almost 40 percent of the total population in SSA, live in urban areas⁽¹⁰⁾, but this is projected to grow to one billion in 2040, and to 1.23 billion in 2050. The levels of hypertension are structurally higher in urban than in rural settings^(11,12) mainly because of contextual and behavioural factors associated with urban environments such as dietary changes and sedentary lifestyle that together form a complex system conducive to developing hypertension⁽¹³⁾. An increase in hypertension prevalence will invariably lead to dramatic rises in the incidence of CVDs, which has the potential to overwhelm health care systems^(14,15). It will also have financial implications for national and local treatment plans because there is increasing evidence that the majority of patients with hypertension will require two or more drugs to achieve adequate blood pressure control⁽¹⁶⁾.

PREVALENCE OF HYPERTENSION IN SSA

Hypertension prevalence in SSA varies widely across countries. Reliable, large-scale, population based data on hypertension in Africa is scarce⁽¹⁷⁾. The WHO STEPS survey conducted between 2003 and 2009 in 20 African countries reported high rates of hypertension in most countries, particularly among men. The prevalence ranges from 19.3% in Eritrea to 39.6% in Seychelles⁽¹⁸⁾. In all countries where data is available from the World Health Study (WHS), the urban population has a higher prevalence of hypertension than the rural population, with South Africa and the Democratic Republic of Congo leading with almost 10 percentage points higher prevalence than the rural population. The huge differences in hypertension prevalence rates across SSA countries are probably due to variations in social economic development, cultural factors and the degree of adoption of unhealthy life styles across SSA countries.

It is well-known that urban averages mask great intra-urban disparities largely due to the presence of large populations in poor slum settlements that characterize most urban centres in Africa. Data from Nairobi collected from the adult popula-

tion in two slum settlements⁽¹⁹⁾ shows a high prevalence of hypertension (overall of 19%) with large sex and age-specific differences.

CHALLENGES OF AWARENESS, TREATMENT AND CONTROL OF HYPERTENSION IN SSA

The low rates of awareness, treatment and control of hypertension in SSA are a major public health concern⁽²⁰⁾. The low levels of these indicators are present in almost all settings on the continent and imply that there will be large populations of hypertensive patients unaware of their increased risk of hypertension-related complications in the coming years. A possible contributory factor to these worrying data could be the affordability of health care, which remains a major barrier in the African setting as out-of-pocket spending is the main source of funding for health care costs⁽²¹⁾.

Another challenge that is prevalent all over SSA is the non-adherence to treatment and follow-up for hypertension. In one intervention study in Cameroon, for instance, just about half of the participants were still in the programme at one-year follow-up⁽²²⁾. Indeed, patients are expected to be treated and controlled only if they can access appropriate health services, receive adequate advice and prescriptions and subsequently can afford and adhere to those prescriptions. Increasing awareness, treatment and control rates of hypertension will have a huge impact on CVD prevention in Africa⁽²³⁾. Whereas in Africa often only 5 to 10 percent is controlled at a blood pressure of less than 140/90 mmHg^(11,24,25), there are also studies from South Africa showing rates of control increasing from 48.4% in 2007–2008 to 53.3% in 2009–2010 indicating that with major efforts, improvement in hypertension control can be made in other SSA countries.

INTERVENTIONS TO ADDRESS THIS RISING PRESSURE

In SSA, providing medication is considered an important and cost effective way to reduce hypertension⁽²⁶⁾, but accessibility to and cost of the treatment are very often forgotten. Currently, African countries are 80 percent below the global average for pharmacological spending and 20 percent below the global average of behavioural risk factors for hypertension⁽²⁷⁾.

The efficacy of blood pressure lowering medications is well demonstrated and treatment of high-risk individuals has been advocated as a major strategy for CVD prevention in all regions, including Africa⁽²⁸⁾. However, the problem of defining a strategy for hypertension control confronts most societies⁽²⁹⁾. Hypertension is fully treatable, but social and economic conditions in many African countries make the implementation of blood pressure control programmes difficult. Lack of a clear strategy based on evidence has undermined these efforts further. Inadequate funds, inexperience, and lack of infrastructure remain important barriers to hypertension detection and treatment⁽³⁰⁾. Accordingly, the overall management of hypertension is as much a socio-economic as it is a therapeutic problem. Screening ideally not only detects hypertension but also forms the basis for education and therapy.

Finding practical solutions for prevention of hypertension in SSA is an enormous task that is achievable only through collaboration. An active approach to hypertension must be driven by the ministries of health as well as by local organizations, with support from influential bodies such as the International Forum for Hypertension Control and Prevention in Africa. The current enthusiasm for collaboration is crucial for the development and implementation of health care policies throughout the region.



STEVEN VAN DE VIJVER MD MIH

TROPICAL DOCTOR, GENERAL PRACTITIONER
AMSTERDAM INSTITUTE FOR GLOBAL HEALTH AND DEVELOPMENT (AIGHD); AFRICAN POPULATION AND HEALTH RESEARCH CENTRE (APHRIC)
SVIJVER@GMAIL.COM

CHARLES AGYEMANG MPH, PHD

EPIDEMIOLOGIST
DEPARTMENT OF PUBLIC HEALTH, ACADEMIC MEDICAL CENTRE, AMSTERDAM
C.O.AGYEMANG@AMC.UVA.NL

REFERENCES

1. United Nations. Political declaration of the high-level meeting of the General Assembly on the prevention and control of non-communicable diseases. United Nations, 2011.
2. Abegunde DO, Mathers CD, Adam T, et al. The burden and costs of chronic diseases in low-income and middle-income countries. *Lancet* 2007;370(9603):1929-38.
3. Gaziano TA. Economic burden and the cost-effectiveness of treatment of cardiovascular diseases in Africa. *Heart* 2008;94(2):140-4.
4. WHO. Global Atlas on cardiovascular disease prevention and control. Geneva, WHO, 2011.
5. Fuentes R, Ilmanemi N, Laurakainen E, et al. Hypertension in developing economies: A review of population-based studies carried out from 1980 to 1998. *J Hypertens* 2000;18:521-9.
6. Ibrahim MM, Damasceno A. Hypertension in developing countries. *Lancet* 2012;380(9841):611-9.
7. Addo J, Smeeth L, Leon DA. Hypertension in sub-Saharan Africa: a systematic review. *Hypertension*. 2007 Dec;50(6):1012-8.
8. Opie LH, Seedat YK. Hypertension in sub-Saharan African populations. *Circulation* 2005;112(23):3562-8.
9. The continuing epidemiological transition in sub-Saharan Africa. A workshop summary. Washington DC, The National Academies Press, 2012 <http://www.ncbi.nlm.nih.gov/books/NBK105418/>
10. UN-Habitat. The state of African cities 2010: governance, inequalities and urban land markets. Nairobi, UN-Habitat, 2010.
11. Damasceno A, Azevedo A, Silva-Matos C, et al. Hypertension prevalence, awareness, treatment and control in Mozambique: urban/rural gap during epidemiological transition. *Hypertension* 2009;54(1):77-83.
12. Agyemang C. Rural and urban differences in blood pressure and hypertension in Ghana, West Africa. *Public Health* 2006;120(6):525-33.
13. Godfrey R, Julien M. Urbanisation and health. *Clin Med* 2005;5(2):137-41.
14. WHO. STEPwise approach to chronic disease risk factor surveillance (STEPS) 2008, update 2012. Available from <http://www.who.int/chp/steps/riskfactor/en/index.html>
15. WHO. Cardiovascular diseases in the African region: current situation and perspectives. 2005.

Further references on our website: www.nvtg.org and available via the author.

Engaging communities in sickness and health

something old
something new
something borrowed
something blue

Organisers
Netherlands Society of Tropical Medicine and International Health (NVTG) - Uniting Streams (US) - Netherlands Red Cross (NLRC) - Share-Net - Tropical Doctors in Training (TROIE)

Wednesday October 22nd 2014

De Rode Hoed, Amsterdam

Preliminary programme symposium
October 22nd, 2014 (language: English)

9.00	Registration and coffee	
9.30	Welcome	
9.35	Something OLD: David Sanders	
10.20	Coffee / tea break	
10.50	Something NEW: Ayham Alomari	
11.35	CHWs: Colin Baynes and Ineke Petter	
12.35	Lunch	
13.30	Uniting Streams Scientific research presentations	Uniting Streams Scientific research presentations
	Rien Gotink Community case management: the UNICEF experience	Koos van der Velden & Karlien Stronks Dutch community health programmes in international perspective (something BORROWED)
14.45	Coffee / tea break & TROIE speeddates for tropical doctors and doctors IH&TM in training	
15.15	Uniting Streams Scientific research presentations	Share-Net Scientific research presentations
	Philips New technologies and new diagnostics in community health	Peter Bob Peerenboom & Cordaid The role of the community in performance-based financing (something BORROWED)
16.30	Drinks with something BLUE (music)	



See for more information and/or registration: www.nvtg.org



A looming crisis of stroke in sub-Saharan Africa: few countries are prepared

Sub-Saharan Africa (SSA) is at a crossroads. The World Health Organization (WHO) has projected that by 2020 SSA will have the largest increases in noncommunicable diseases (NCDs) deaths.⁽¹⁾ Unfortunately SSA will also continue to suffer from the effects of Infectious Diseases (IDs). One of the NCDs is cerebrovascular disease (stroke). In this article, the epidemiology, diagnostic capacity, available treatment and patient rehabilitation in SSA settings is briefly reviewed.

EPIDEMIOLOGY

The incidence of stroke is unknown in many of the SSA countries. Few studies have been done to look specifically at the burden of stroke in this setting with the exception of South Africa where stroke prevalence is as high as in developed countries.⁽²⁾ Most of the reports are hospital based. Prevalence of stroke between 0.26 and 300/100,000 have been reported.⁽²⁾ One-year mortality after stroke in a limited number of studies from Africa has been reported up to 60%.⁽³⁾ Community studies are required to establish the true burden of this important health problem.

ETIOLOGY OF STROKE

The causes of stroke in SSA are not well characterized. Hypertension is assumed to be the most common cause.⁽⁴⁾ Hypertension screening is not routine and is likely to be diagnosed late. Its treatment is usually suboptimal due to many factors including drug stock outs. When patients present with stroke it may not be easy to establish the causal relationship between hypertension and stroke. Hypertension may be an acute response to stroke in up to 60% of patients.⁽⁵⁾ Diabetes mellitus, hyperlipidemia and heart failure seem to contribute much less.⁽⁴⁾ The role of HIV and other infections is less appreciated. In SSA younger patients presenting with stroke are more likely to be HIV positive.^(6,7) CNS opportunistic infections (cryptococ-

cal meningitis, TB meningitis, CMV) contributed 23% of all stroke cases in one study.⁽⁶⁾ More than 80% of strokes happen in low- and middle-income countries where infections are also prevalent even without HIV risk.⁽⁸⁾ Some patients presenting with stroke lack the traditional risk factors for stroke. Black Africans develop stroke at an earlier age compared with Whites living in the same country.⁽⁴⁾ The role of rheumatic heart disease (RHD) and its complication has not been fully studied. More than 1 million people live with RHD and upward of 250,000 die each year of its complications.⁽⁹⁾ There is little data on the incidence of infective endocarditis in SSA. Where infective endocarditis has been looked at, it tends to affect young adults and RHD is a common cause.⁽¹⁰⁾ Infected emboli from the valves can and do cause stroke-like syndromes. Many other infections like neurocysticercosis, viral infections (herpes simplex, varicella zoster virus, CMV) have been known to cause stroke. Systemic infections have also been shown to cause stroke.⁽¹¹⁾

At the end of 2012, almost 10 million HIV-infected individuals were on HAART, 63% of these were in SSA.⁽¹²⁾ Short term HAART seems to ameliorate vascular dysfunction that leads to early atherosclerosis in HIV-infected individuals.⁽¹³⁾ However, HAART has also been shown to increase the rate of vascular events.⁽¹⁴⁾

Many Africans living in cities have adopted Western dietary habits. This has resulted in increasing rates of obesity in children and adults. Obesity increased by 35% between the years of 1992 and 2005. The increase was more than 50% at the poor end of the spectrum compared with 7% at the rich end of the spectrum.⁽¹⁵⁾ Increasing rates of obesity will result in increased rates of cardiovascular diseases, hypertension, type 2 diabetes mellitus and stroke. Abdominal obesity has been associated with increasing rates of stroke in all races.

The risk is much higher in younger people.⁽¹⁶⁾ Data on tobacco use in SSA is sparse. Data indicates that SSA is still in the early phase of a cigarette smoke epidemic.⁽¹⁷⁾ This situation can quickly change if smoking control measures are not quickly adopted by governments in the region.

DIAGNOSTIC PROCEDURES

National Institute for Health and Clinical Excellence (NICE) guidelines 2008 (<https://www.nice.org.uk/guidance/CG68>) recommend the investigations that should be done in all patients to evaluate the type of stroke so as to help in the management of the patient presenting with stroke. While Computer Tomography (CT) scan without contrast is available in many cities in SSA, this is not true of many district and sub-district hospitals where the majority of patients present. Furthermore, even where the scans are available, radiologists and neurologists to report on the CT scan findings may not be present. As a result diagnosis is mostly clinical in nature and thus likely to overestimate the prevalence of stroke in these settings. In settings where CT scans can be done, it may not be possible to investigate for the underlying cause of the stroke.

TREATMENT MODALITIES

One of the requirements for thrombolysis in patients presenting with occlusive stroke is the time interval between the beginning of symptoms and presentation at a health facility. Even in developed countries only 20-30% of patients with stroke present themselves to hospital within 4.5 hours.⁽¹⁸⁾ Therefore the majority of patients even in developed countries are not eligible for thrombolysis. In many sub-Saharan Africa settings, patients are deemed to have presented early to a health facility if they do so within 24 hours of onset of symptoms.⁽¹⁹⁾

SUCCESSFUL MANAGEMENT

Successful management of stroke patients is dependent on a coherent stroke management team comprising of stroke nurses, physicians, physiotherapists, occupational and speech therapists and social workers. Much of SSA is plagued with human resource for health crises. Many of the team members required for a successful stroke management are missing. In Malawi, there is 1 physiotherapist for almost half a million people.⁽²⁰⁾ Even in South Africa, considered to be much better resourced than other African countries, there are only 2 occupational therapists and 2.5 physiotherapists for every 100,000 population. In one study in rural South Africa, patients discharged from hospital were unable to continue physical therapy at home because of non-availability of rehabilitation facilities.⁽²¹⁾ Many categories of a good stroke management team are either forgotten or not considered to be essential health service providers in SSA. The World Bank report of the year 2000 that details the human resource crisis for health in sub-Saharan Africa looked at physicians, nurses, midwives and pharmacists among the human resource required. The report is silent on the crisis affecting the rehabilitation cadres of the health work force.⁽²²⁾

IN CONCLUSION

Although SSA has a looming crisis of non-communicable diseases including stroke, few countries if any are prepared to face this challenge. There is little data in the region that can be used for policy formulation. The teams required to manage stroke in its entirety are missing. There is an urgent need for well-designed studies (using standard definition for stroke) to characterize the incidence, prevalence, and type of stroke including the risk factors. Training for health providers to meet the challenge needs to start. There is need to review curriculums for doctors, nurses, physiotherapists and others to include NCDs

as major challenges that the continent will soon face.



JOHNSTONE J KUMWENDA MBCHB (NBI) FRCP (UK)

PROFESSOR OF MEDICINE
DEPARTMENT OF MEDICINE, UNIVERSITY OF NAMIBIA, SCHOOL
OF MEDICINE, WINDHOEK, NAMIBIA
E-MAIL: JONNYKUMWENDA@HOTMAIL.COM

REFERENCES

1. Lim SS, Vos T, Flaxman AD, Danaei G, Shibuya K, Adair-Rohani H et al. A comparative risk assessment of burden of disease and injury attributable to 67 risk factors and risk factor clusters in 21 regions, 1990-2010: a systematic analysis for the Global Burden of Disease Study 2010. *Lancet* 2012; 380: 2224-60.
2. Walker R, Whiting D, Unwin N et al. Stroke incidence in rural and urban Tanzania: a prospective, community-based study. *Lancet Neurology* 2010; 9: 786-92.
3. Heikinheimo T, Chimbayo D, Kumwenda JJ, Kampondeni S, Allain TJ. Stroke outcomes in Malawi, a country with high prevalence of HIV: a prospective follow-up study. *PLoS One*. 2012;7(3):e33765. doi: 10.1371/journal.pone.0033765. Epub 2012 Mar 29.
4. Connor MD, Modi G, Warlow CP. Differences in the Nature of Stroke in a Multiethnic Urban South African Population: The Johannesburg Hospital Stroke Register. *Stroke* 2009; 40: 355-62.
5. Qureshi AI, Ezzeddine MA, Nasar A, Suri MF, Kirmani JF, Hussein HM, Divani AA, Reddi AS. Prevalence of elevated blood pressure in 563,704 adult patients with stroke presenting to the ED in the United States. *Am J Emerg Med* 2007; 25: 32-8.
6. Kumwenda JJ, Mateyu G, Kampondeni S, van Dam AP, van Lieshout L, Zijlstra EE. Differential Diagnosis of Stroke in a Setting of High HIV Prevalence in Blantyre, Malawi. *Stroke* 2005; 36: 960-4.
7. Tipping B, de Villiers L, Wainwright H, Candy S, Bryer A. Stroke in patients with human immunodeficiency virus Infection: *J Neurol Neurosurg Psychiatry* 2007; 78: 1320-4.
8. Feigin VL, Lawes CM, Bennett DA, Barker-Collo SL, Parag V. Worldwide stroke incidence and early case fatality reported in 56 population-based studies: a systematic review. *Lancet Neurol* 2009; 8: 355-69.
9. Beaton A, Okello E, Lwabi P, Mondo C, McCarter R, Sable C. Echocardiography Screening for Rheumatic Heart Disease in Ugandan Schoolchildren. *Circulation* 2012; 125: 3127-32.
10. Koegelenberg CF, Doubell AF, Orth H, Reuter H. Infective endocarditis in the Western Cape Province of South Africa: a three-year prospective study. *QJM* 2003; 96: 217-25.
11. Fugate JE, Lyons JL, Thakur KT, Smith BR, Hedley-Whyte ET, Mateen FJ. Infectious causes of stroke. *Lancet Infect Dis* 2014. Published Online May 30, 2014.
12. Global update on HIV treatment 2013, results, impact and opportunities: WHO/UNAIDS/UNCEF v2 June 2013.
13. Francisci D, Giannini S, Baldelli F. HIV type 1 infection, and not short-term HAART, induces endothelial dysfunction. *AIDS* 2009; 23: 589-96.
14. Friis-Moller N, Weber R, Reiss P. Cardiovascular disease risk factors in HIV patients – association with antiretroviral therapy. Results from the DAD study. *AIDS* 2003; 17: 1179-93.
15. Ziraba AK, Fotsjo JC, Ochako R. Overweight and obesity in urban Africa: A problem of the rich or the poor? *BMC Public Health* 2009; 9: 465.

Further references on our website: www.nvtg.org and available via the author.

COLOPHON

MT Bulletin of the
Netherlands Society for
Tropical Medicine and
International Health

ISSN 0166-9303

CHIEF EDITOR
Hans Wendte

EDITORIAL BOARD
Joost Commandeur
Esther Jurgens
Steven Smits
Ed Zijlstra

LANGUAGE EDITING
Elsa van Gelderen

COVER PHOTO
Hanneke de Vries

DESIGN
Mevrouw VANMULKEN
Amsterdam



DIABETES MELLITUS IN AN AFRICAN CONTEXT: THE MALAWI EXPERIENCE

INTRODUCTION

Diabetes mellitus (DM) is among the most important noncommunicable diseases (NCDs); the International Diabetes Federation (IDF) estimates that 8.3% of adults (382 million people) have DM of which 80% live in low- and middle-income countries (LMICs)⁽¹⁾. DM causes considerable morbidity and mortality and it is a risk factor for cardiovascular disease, in particular myocardial infarction and stroke. DM has always been important in tropical medicine but it never received the attention it deserves. Type 2 DM is most common; the incidence of type 2 DM in LMICs is expected to increase, as elsewhere, because of life style changes that include eating fast food, lack of exercise and obesity, usually in the context of the metabolic syndrome. Ageing of the general population is another contributing factor. In addition, there is an interaction with another major tropical disease: HIV infection that can cause the metabolic syndrome, and antiretroviral drugs used to treat HIV, such as stavudine and lamivudine, may aggravate this, thus leading to newly developing diabetes.

Type 2 DM accounts for >90% of DM cases in Africa; the increase in type 2 DM in Africa is expected to be 161% by 2030 compared to 2000 which is considerably more than the worldwide increase of 114%. In contrast, type 1 DM is less common in sub-Saharan Africa than in Europe or North America for reasons that are not well understood; genetic differences, prolonged breast feeding and exposure to repeated infections that influence the immune system have all been suggested⁽²⁾.

The prevalence of DM in sub-Saharan Africa has not been described in detail in many countries.

THE SITUATION IN MALAWI

For Malawi, recently a survey (conducted in 2009) was published that estimated the magnitude of DM and impaired fasting blood glucose (FBG). In 3056 participants (70% females, 88% from rural areas) an overall prevalence of impaired FBG of 4.2% was found, more in men than in women. There were no differences in prevalence between rural and urban areas. The prevalence of diabetes that was recorded reflects an increase from <1% in the 1960s to 5.6% in 2009⁽³⁾.

There is a diabetes clinic at Queen Elizabeth Central Hospital, Blantyre, the only teaching hospital in Malawi; the hospital is affiliated to the College of Medicine. While the clinic has

existed for many years, there was little information on the patient population, and there was concern about the quality of care delivered as no data were available on the diabetic control in individual patients and common oral antidiabetic drugs such as glibenclamide and metformin were often out of stock. Patients are then advised to buy these drugs on the private market. Clearly this does not happen in most cases. The same applies to insulin that also requires refrigeration; if patients do not have a refrigerator they often use a clay pot that may help in reducing the temperature.

Another problem is knowledge and understanding of DM; many patients do not have a clear idea what DM is and what is required in terms of management. This also applies to keeping to a diet that is focused on a more or less equal intake of carbohydrates throughout the day and avoiding peaks such as caused by soft drinks.

RESEARCH IS NEEDED TO GUIDE MANAGEMENT

In 2007 a team of physicians from the Department of Medicine with special interest in DM managed to acquire funds to start a prospective cross-sectional survey to describe current management, control and complications of adult DM patients that included the assessment of the prevalence of HIV⁽³⁾.

In this study the following results were obtained: a total of 620 patients were included with a mean age of 52 years; 60% were female. 18% were type 1 diabetes with a mean body mass index (BMI) of 24.5 (range 14-39), while the mean BMI in type 2 diabetics was significantly higher at 28 (range 15-48). Poor hypoglycemic control was reflected in fasting blood sugar levels (mean 182 mg/dL) and in the glycosylated haemoglobin levels (HbA1c) that reflect glycemic control in the preceding 3-6 weeks. Only 25% were in the target range of HbA1c < 7.5%, while 34% was between 7.5-10% and 41% had levels > 10%, reflecting very poor control. Microvascular complications were common: nephropathy in 35%, retinopathy in 35% and neuropathy in 46%. The prevalence of HIV was 14%; those who were HIV positive more often had albuminuria, but there was no association with retinopathy or neuropathy⁽³⁾. In another study, the prevalence of Sight Threatening Diabetic Retinopathy was high (~ 19%) in both type 1 and type 2 diabetics⁽⁴⁾.

Hypertension was also common with systolic BP > 140 mm Hg in 52%. The poor control of hypertension adds to the risk of the development of macrovascular complications. More aggressive antihypertensive therapy is needed. Also here, the availability of drugs plays a role; another complicating factor is the lack of

good studies in Africans as the response to antihypertensive treatment may be different in African people as was clearly shown in various large studies in the USA where differences in white and black populations were found.

In 2009, the DM clinic was further reformed taking the DOTS framework for tuberculosis as an example. This includes standardized treatment through guidelines, improved drug supply and training of health workers, in particular diabetes nurses. An electronic medical record system was introduced for better management and monitoring. A total of 1864 patients were registered by end 2010⁽⁵⁾.

CONCLUSION AND LESSONS LEARNED

The Malawi experience shows an alarming increase in people with impaired FBG and poor control even in those who attend a specialized clinic. However, there is increasing awareness for

DM and there are WHO guidelines for non-communicable diseases (package for essential non-communicable diseases-PEN) that could be used for screening for DM in community-based programmes. The DM clinic has been thoroughly transformed by the various studies that were conducted; there is ongoing research on DM and students benefit from the increased level of care in their clinical attachments. There are special diabetes nurses and there is participation of the patient community to encourage others to be educated about DM and promote better compliance. It is to be hoped that the experience in the clinic in Blantyre will be expanded to other hospitals and clinics in the country.



ED ZIJLSTRA, FRCP FRCPATH MSC PHD
 INTERNIST- INFECTIOUS DISEASE PHYSICIAN
 ROTTERDAM CENTRE FOR TROPICAL MEDICINE
 E.E.ZIJLSTRA@ROCTM.COM

REFERENCES

1. Guariguata L, Whiting D, Hambleton I, Beagley J, Linnenkamp U, Shaw JE. Global estimates of diabetes prevalence for 2013 and projections for 2035 for the IDF Diabetes Atlas. *Diabetes Res Clin Pract* 2014; 103: 137-49.
2. Gill G. Diabetes in Africa – Puzzles and challenges. *Indian J Endocrinol Metab* 2014; 18: 249-51.
3. Cohen DB, Allain TJ, Glover S, Chimbayo D, Dzamalala H, Hofland HWC, Banda NPK, Zijlstra EE. A survey of the management, control, and complications of diabetes mellitus in patients attending a diabetes clinic in Blantyre, Malawi, an area of high HIV prevalence. *Am J Trop Med Hyg* 2010; 83: 575-81.
4. Glover SJ, Burgess PI, Harding SP, Hofland HW, Zijlstra EE, Allain TJ. Prevalence of diabetic retinopathy, cataract and visual impairment in patients with diabetes in sub-Saharan Africa. *Br J Ophthalmol* 2012; 96: 156-61.
5. Allain TJ, van Oosterhout JJ, Douglas GP, Joukes S, Gadabu OJ, Darts C, Kapur A, Harries AD. Applying lessons learnt from the 'DOTS' Tuberculosis Model to monitoring and evaluating persons with diabetes mellitus in Blantyre, Malawi. *Trop Med Int Health*. 2011; 16: 1077-84.



NETHERLANDS SOCIETY
FOR INTERNATIONAL SURGERY



Deutsche
Gesellschaft für
Tropenchirurgie



WHAT
IS YOUR
ROLE?

Two billion people in the world have limited access to basic surgical care.

This symposium seeks to strengthen surgical care in countries with low resources.

On Friday and Saturday there are contributions of international organisations, such as the WHO (Meena Cherian), ICES (Michael Cotton), ICRC (Harald Veen) and IFSC (Robert Lane). On Sunday there are practical sessions to train surgical skills. Global health initiatives play a vital role and will be thoroughly discussed.

Visit our website for information and registration.

Accreditation has been approved by the NVTG (14 pts).








LAB111, Amsterdam
www.surgicalneed.nl



Snakebite, a neglected health problem!

Snake bite has long been recognized as a serious health problem in many tropical regions. It typically affects populations in remote areas who have limited access to health services, while adequate treatment with antivenom is often not available. For this reason, snake bite was recognized by WHO as a neglected tropical disease and was included in 2009 on the list of NTDs under 'other' conditions.

EPIDEMIOLOGY

Despite the wide variation in occurrence, snake bite is most common in the resource poor setting of tropical countries of Africa, Asia and Latin America, with few reliable data on incidence. Most victims in the rural tropics rarely go to hospital, preferring potentially harmful treatment by traditional healers and are thus lost for the official statistics. Snake bite is mainly a rural and occupational hazard, with farmers, plantation workers, herds-men, hunter gatherers and military personnel at greatest risk. Children are frequently bitten due to their inquisitive nature while more recently travellers are increasingly reported to be subject to snake bite as numbers of travellers increase and destinations are becoming more adventurous and remote. Most bites occur in the daytime and involve the foot or the lower leg as a result of accidentally disturbing a snake; snakes are normally not aggressive by nature.

Globally an estimated 5.4 – 5.5 million people are bitten by snakes each year, with more than 2.5 million envenomings^(1,2), resulting in about 400,000 amputations⁽³⁾ and 20,000 to 125,000 deaths^(1,2). This high death toll reflects the population at risk in rural areas in

tropical countries who lack access to proper medical care and treatment.

Venomous species are widely distributed, except at altitudes above 5,000 meters, in polar regions and in most islands of the western Mediterranean, Atlantic, Caribbean and Pacific. There are no venomous snakes in Madagascar, New Zealand, Ireland, Iceland and Chile. Sea snakes exist in the Indian and Pacific oceans and in river estuaries (New Guinea) and lakes (Philippines, Cambodia, Solomon Islands).

Worldwide, of the 2,700 species of snakes, about 300 belong to the families of venomous snakes, that have one or more pairs of enlarged teeth in the upper jaw – the fangs- which penetrate the skin of their prey or victim and enable them to inject venom into the tissues. The venom is produced by two venom glands, one at each side of the head surrounded by muscle, which on contraction pushes the venom out of the gland to reach the venom duct and the canal or groove of the fangs. Only about 200 species are known to have caused death or permanent disability after biting humans. Constrictor snakes kill their prey by strangulation and are potentially dangerous to man (giant constrictors, family *Boidae*, in the New World, and pythons in the Old World). They do not have fangs.

CLASSIFICATION OF VENOMOUS SNAKES

Most venomous snakes belong to the families of *Elapidae* or *Viperidae*. To the *Elapidae* belong the African and Asian cobras, African mambas, Asian kraits, American coral snakes, Australasian terrestrial venomous snakes and sea snakes, with relatively short anterior and permanently erect fangs. They cause neurotoxicity and usually minimal signs at the bite site (with the exception of some cobras which also cause necrosis). Sea snakes cause myotoxicity and subsequent paresis.

In vipers (viperids of the subfamily *Viperinae*) and pit vipers (crotalids of the subfamily *Crotalinae*), the fangs are mostly large and mobile. Except in the Pacific Australasian area where vipers do not naturally occur, they are much more common than elapid snakes. The bite of a member of the *Viperidae* generally leads to local swelling, shock, bleeding and non-clotting blood. The Old World vipers, subfamily *Viperinae* include European, African and Asian vipers and adders. Pit vipers possess a heat-sensitive pit organ behind the nostril used for orientation. They comprise rattle snakes, moccasins, South American lance-head vipers and Asian pit vipers.

There is also a small group of venomous colubrids (*Colubridae*), of which the boomslang in southern Africa and the Southeast Asian red-necked keel-back snake are the most common examples of medical importance. They have short immobile fangs placed posteriorly in the mouth. The African and Middle Eastern burrowing asps, stiletto- or side stabbing snakes (family *Atractaspididae*) have long front fangs impaling their victims by a side-swing motion, some with fatal envenomation, but these snakes are of less epidemiological importance.

CLINICAL FEATURES

Snake venoms are rich sources of pharmacologically active peptides and proteins, and also non protein toxins and other small molecules. They vary by species, subspecies, and even geographic variant level, inducing a wide range of clinical signs and symptoms. Therefore the pattern of envenoming depends upon the biting species and is further the result of other factors such as the geographical environment, season, and ageing. Only 50-70 % of patients bitten by venomous snakes develop signs of envenoming, most likely as the result of a defensive bite without injecting venom or of a dry bite because the venom has recently been used.



The black mamba. It is one of the most dangerous snakes in Africa. Its venom causes neurotoxicity leading to convulsions and respiratory arrest and may cause death in 50% of patients within hours.

The major clinical effects following snakebite are as follows.

Local effects: pain and swelling or formation of blisters on the bitten limb, with possible necrosis at the site of the wound.

Systemic effects:

- non-specific: autopharmacological symptoms immediately after the bite, like vomiting, headache, collapse, sweating, anxiety.
- specific signs like: 1) non-clotting blood and bleeding from gums, old wounds, sores, 2) neurotoxicity (ptosis, bulbar palsy and respiratory paralysis), 3) rhabdomyolysis (muscle pains and black urine), 4) shock, hypotension, usually resulting from hypovolaemia, which might lead to acute renal failure.

In case of envenomation by a spitting cobra which can eject the venom from a distance of a few meters, the venom may affect the eye, causing intense local pain and severe conjunctivitis with leucorrhoea.

FIRST AID

First aid can be carried out only by bite victims themselves or bystanders, using materials that are immediately available. Many symptoms following snake bite are caused by anxiety. Victims need to be reassured. The limb has to be immobilized as moving it may increase absorption of venom. Harmful manoeuvres such as cutting, suction or

tourniquets must be avoided. A pressure bandage should be considered in regions where snakebite does not cause tissue necrosis, particularly if rapid transport to hospital is not possible. The victim has to be transported as soon as possible to a medical facility for professional help, in recovery position because vomiting may occur.

CLINICAL MANAGEMENT

Patients are observed in hospital for 12-24 h, even if signs of envenoming initially are not present. Tetanus prophylaxis should be given. Immediate antibiotic prophylaxis is only required in case of signs of secondary infection at the place of the bite. Careful monitoring of vital signs and signs of envenomation is crucial.

Antivenom is only indicated for signs of systemic envenoming and/ or if swelling of the limb extends over more than half the bitten limb. Monovalent or monospecific antivenom is used for a single species of snake. However, in rural areas, the identification of the snake is often not possible, and moreover these expensive antivenoms are not available. Even polyvalent products for a number of regionally present snakes are worldwide in short supply, are frequently of poor quality and still too costly in the situation where they are most needed. Antivenoms are produced by immunizing large animals, usually horses. Therefore administration of antivenom has a high risk of developing severe anaphylaxis and it needs to be done in an adequate medical environment. In addition to antivenom

treatment supportive medical care (e.g. respiratory support and renal replacement therapy) is regularly needed.

PREVENTION

In rural tropical areas, eradication of venomous snakes is, for ecological reasons, no option. Community education to reduce the risk of bites is the best approach, based on knowledge of circumstances in which bites most occur. Wearing proper boots or shoes and ideally long trousers are essential to avoid snake bites. Carrying a torch at night is useful, as is stepping hard on the ground when walking (because snakes are sensitive to vibration). Sleeping on the ground without a sewn-in ground sheet should be avoided and camp beds are recommended. Bed nets are also protective.

Acknowledgement

I am grateful to Ed Zijlstra for critically reviewing the manuscript.



PIETER VAN THIEL, MD, PHD

CENTRE FOR TROPICAL AND TRAVEL MEDICINE, ACADEMIC MEDICAL CENTRE, AMSTERDAM
P.P.VANTHIEL@AMC.UVA.NL

REFERENCES

1. Chippaux JP. Snake-bites: an appraisal of the global situation. *Bull World Health Organ* 1998; 75:515-24.
2. Kasturiratne A, Wickremasinghe AR, De Silva N, et al. The global burden of snakebite: a literature analysis and modelling based on regional estimates of envenoming and deaths. *PLoS Med* 2008;5:e218.
3. Mion G, Olive F. Les envenimations par vipéridés en Afrique Noire. In: Saissy JM, ed. *Réanimation tropicale*. Paris:Arnette, 1997:349-66.
4. Warrell DA. Snake bite *Lancet* 2010; 375:77-88.



Screening for and management of Cardiovascular Risk Factors in the HIV-infected patient

INTRODUCTION

In 2013 more than 2 million people infected with HIV started antiretroviral therapy (ART) and at the start of 2014 12 million HIV-infected patients in low- and middle-income countries (LMIC) were receiving ART⁽¹⁾. This is the largest ever growth in people on ART. As a result the life expectancy of many HIV-infected people is expected to improve considerably.

Because of this improved access to ART availability and good outcome results, there is increasing focus on the long-term effects of suppressed infection and ART. In Western studies it has been shown that HIV-infected patients on ART can now have a near normal life expectancy. However, the incidence of noncommunicable diseases and especially that of atherosclerotic vascular diseases in this population is increasing⁽²⁾. A recent study found subclinical atherosclerosis in 18% of HIV-infected adults in Uganda⁽³⁾. They also found an association with traditional cardiovascular disease (CVD) risk factors and subclinical atherosclerosis.

ATHEROSCLEROTIC VASCULAR DISEASE AND HIV

The increase in atherosclerotic vascular diseases in this group of patients is thought to be caused by both the effects of HIV and of ART^(4,5). HIV infection results in low-level chronic inflammation that affects endothelial cells and induces a pro-thrombotic state, resulting in a higher incidence of atherosclerosis. ART may have additional effects on the risk CVD as well, though it is unclear to which extent ART independently contributes to CVDR. Lowering HIV viral load with effective ART reduces chronic inflammation, which lowers the cardiovascular risk. However ART also causes metabolic changes like insulin resistance and dyslipidemia that increase the cardiovascular risk. The latter is especially true for ART regimens containing a protease inhibitor (PI).

Therefore it is assumed that low-level chronic inflammation and the metabolic changes caused by ART will contribute to the CVDR in an ageing HIV-infected population on long-term ART. Studies on this subject in non-Western populations are ongoing. It is thought that these effects may be attenuated in LMIC, because ART on average is started later and ART with more side effects is used.

ASSESSMENT

It is recommended to screen HIV-infected patients for cardiovascular risk annually, before initiating ART and after initiating or changing ART⁽⁶⁾. Recommendations on the time of screening after initiating or changing ART differ. Most guide-

lines recommend doing so in three to six months. However, if TG levels are elevated prior to initiation of ART it is recommended to repeat the fasting lipid profile one to two months after starting ART. Obtaining a baseline fasting lipid profile when initiating or changing ART is also recommended.

Screening HIV-infected patients for cardiovascular risk should consist of a fasting lipid profile and assessment of established risk factors⁽⁶⁾. The decision whether or not to treat dyslipidemia should take into account other, general cardiovascular risk factors (age>45 for men, age>55 for women, family history of premature CVD, cigarette smoking, hypertension, LDL>40mg/dL) and should not be based solely on plasma lipid levels. If two or more risk factors exist a 10-year risk calculation should also be performed. This 10-year risk calculation is available at <http://cvdrisk.nhlbi.nih.gov/calculator.asp>.

ART CHOICE AND TREATMENT

When starting combination ART in patients with a high risk of CVD preference should be given to drugs with favourable effects on plasma lipid levels⁽⁶⁾. Atazanavir or darunavir are preferable to other PIs when initiating therapy in treatment-naïve patients with a high risk of CVD. When no evidence of drug resistance or renal disease exists tenofovir and emtricitabine may be a preferred backbone in the ART regimen for these patients.

Several options for the management of dyslipidemia are available. In mild cases of dyslipidemia therapeutic life style changes are advocated for normalization of plasma lipid levels. In cases of clear ART-related dyslipidemia one could consider changing ART, though this may not be preferable in patients on effective combination ART. Finally one could consider starting lipid-lowering drugs, although in HIV-infected patients the use of these drugs can give significant interactions with ART.

THERAPEUTIC LIFE STYLE CHANGES

The recommendation of life style changes as a therapeutic option for dyslipidemia in HIV-infected patients is based mainly on observations in the HIV-uninfected population. Recommended life style changes include optimal management of hypertension and diabetes mellitus, dietary and exercise interventions, and cessation of cigarette smoking⁽⁵⁾.

SWITCHING PI

Studies show that in those who are on a PI it may be beneficial to switch to a non-PI based regimen as HDL plasma levels may improve^(5,6). However, with new PIs like atazanavir this may not be necessary anymore. In addition, switching to e.g. efavirenz

from a PI-based regimen will not always improve hypercholesterolaemia. Only very few studies have evaluated the effect of switching ART on dyslipidemia. Switching from a lopinavir-containing regimen to an atazanavir-containing regimen in patients with dyslipidemia has a positive effect on lipid levels. Switching from a boosted PI to a raltegravir-based regimen has similar positive effects. It should be noted that some patients who were switched to raltegravir did, however, experience virologic breakthrough, while this was not reported in patients who were switched to another PI.

STATINS

Statins are as effective in the HIV-infected population as in the general population. A statin is therefore the first choice therapy when plasma LDL levels are elevated, without severe hypertriglyceridaemia (TG < 5.65 mmol/l). Use of statins in ART-treated patients is, however, complicated by pharmacokinetic interactions.

PIs, by inhibiting CYP3A4, may cause up to a 32-fold increase in simvastatin and lovastatin levels. Therefore these statins should be avoided when PIs are used. Also delavirdine, an NNRTI, inhibits this enzyme. Nevirapine and efavirenz on the other hand induce CYP3A4. Atorvastatin activity is doubled, and pravastatin levels are decreased by co-administration of PIs. Rosuvastatin in combination with boosted lopinavir or boosted atazanavir can increase levels of rosuvastatin via an unknown pathway. As a consequence, in PI-treated patients in which statin-therapy is indicated it is best to prescribe pravastatin, atorvastatin or fluvastatin⁽⁶⁾.

CONCLUSION

The management of cardiovascular risk in an ageing HIV-infected population is a complex problem that is of great importance to the individual patient. It is therefore important to closely monitor lipid profiles and other risk factors in HIV-infected patients, and to treat accordingly. This is especially important in patients who are currently being treated with a PI. However, with the availability of newer and better antiretroviral drugs, this cardiovascular risk may become less important.

Recommendations for the treatment of dyslipidemia in HIV-infected patients are very similar to those for the general population. Smoking cessation and other life style changes are equally important in an HIV-infected patient as in a non-HIV-infected patient. Additionally, pharmacological treatment of dyslipidemia in HIV-infected patients is more complicated than in non-HIV-infected patients because of pharmacokinetic interactions. However, there are lipid-lowering drugs that can safely

and effectively be used in the HIV-infected patient. Substitution of antiretroviral drugs to normalize lipid levels should only be considered if indicated treatment with lipid-lowering drugs is unsuccessful.

New guidelines from the WHO on the diagnosis and management of non-communicable diseases in HIV-infected patients are expected this year⁽²⁾. In the meantime it is good to remind ourselves that the chronic care that comes with HIV treatment provides the clinician working in LMIC with a great opportunity for cardiovascular risk screening. It is an opportunity that we should not miss out on and that we should use to decrease the risk of cardiovascular diseases in the HIV-infected population.



JOOST COMMANDEUR BSC
RESEARCH ASSISTANT

DEPARTMENT OF INTERNAL MEDICINE, VU UNIVERSITY MEDICAL CENTRE, AMSTERDAM, THE NETHERLANDS AND DEPARTMENT OF MEDICINE, KILIMANJARO CHRISTIAN MEDICAL CENTRE, MOSHI, TANZANIA
JO.COMMANDEUR@VUMC.NL

REFERENCES

1. World Health Organization. Global update on the health sector response to HIV. Geneva, 2014.
2. World Health Organization. Consolidated guidelines on the use of antiretroviral drugs for treating and preventing HIV infection: Recommendations for a public health approach. Geneva, 2013.
3. Ssinabulya I, Kayima J, Longenecker C, Luwedde M, Semitala F, Kambugu A, et al. Sub-clinical atherosclerosis among HIV-infected adults attending HIV/AIDS care at two large ambulatory HIV clinics in Uganda. *PLoS One* 2014;9(2):e89537.
4. Deeks SG, Lewin SR, Havlir DV. The end of AIDS: HIV infection as a chronic disease. *Lancet* 2013;382:1525-33.
5. Thienemann F, Sliwa K, Rockstroh JK. HIV and the heart: The impact of antiretroviral therapy: A global perspective. *Eur Heart J* 2013;34:3538-46.
6. Dubé MP, Stein JH, Aberg JA, Fichtenbaum CJ, Gerber JG, Tashima KT, et al. Guidelines for the evaluation and management of dyslipidemia in human immunodeficiency virus (HIV)-infected adults receiving antiretroviral therapy: Recommendations of the HIV medical association of the Infectious Disease Society of America and the Adult AIDS Clinical Trials Group. *Clin Infect Dis* 2003;37:613-27.



Non-union of a lower arm fracture



Figure 1. The fracture at presentation



Figure 2. The fracture after operation showing misplacement of the metal pin in the ulna.

SETTING

The Lion Heart Medical centre is located in the small town of Yele in the centre of Sierra Leone. This rural hospital is staffed with 2 Dutch tropical doctors and local clinical health officers. There are 50 beds available for patients and the facilities are basic including ultrasound, laboratory, X-ray, operating theatre and an outpatient clinic. The nearest referral possibility is available in Freetown, a 6-hour drive away and even longer by public transport.

CASE

A 29-year-old man presented at the outpatient clinic with a small bandage on his left arm; he had injured his arm three months before in a motorcycle accident. He had first gone to the traditional healer, but after three months there was no significant improvement. Upon clinical examination abnormal mobility was felt midway in his lower left arm. No wounds or scars were observed and his left hand had normal function. The X-ray showed a midshaft fracture of both ulna and radius (figure 1). Initially plaster of Paris (POP) was applied under traction for three weeks to improve position.

SPECIALIST ADVICE

The surgical and orthopedic specialists were asked for their treatment advice for this 3 months old fracture. Within 48 hours the specialists responded and they all agreed that an operation would be the best treatment for this non-union. It was discussed that it would be a difficult procedure and therefore they advised to explore the possibility of having a visiting surgeon assist in this procedure. It was also suggested that there might be a slight chance the fracture would also heal with POP extended to the upper arm.

TREATMENT

The above-mentioned possibilities were discussed with the patient and he preferred to be operated in The Lion Heart Medical centre at short notice. With the help of detailed instructions from the specialists the procedure was carried out. In theatre, the old callus was scraped away from the fracture ends and both the radius and ulna were fixated with metal pins (k-wires). Unfortunately the X-ray (figure 2) showed that the pin through the radius was misplaced and therefore had to be removed immediately after the procedure. POP was applied to the upper and lower left arm for six more weeks, after which the second pin was removed. POP was applied again for three more weeks.

RESULT AND FOLLOW-UP

Nine weeks after surgery the POP was removed. Clinically the ulna was reunited, but the radius was not, probably due to misplacement and removal of the metal pin.

Unfortunately at that moment the X-ray device was out of order, so imaging of the final result was not available. However, most importantly the left arm was functional again. The wrist joint functioned normally and flexion and extension of the elbow joint was also

possible. Pronation and supination of the lower left arm were restricted due to instability of the radius. The main outcome was that the patient was able to grab and hold objects again with his left arm due to the stability of the ulna. Therefore the patient was very pleased with the final outcome.

BOX 1

NON-UNION OF A FRACTURE

Incomplete healing of a fracture in which both cortices of the bone fail to join is called a non-union, which commonly presents with continuing pain, swelling or instability. Common causes for non-union include poor fixation leading to excessive movement at the fracture site, insufficient apposition of the bone fragments where the fragment ends are too far from each other and inadequate blood supply to the fractured bones (this is common for example in fractures involving the scaphoid and proximal fifth metatarsal bone). Fractures with severe soft tissue injury, for example high-energy trauma, are also more at risk for a non-union. Other predisposing factors include chronic disease, malnutrition, immunosuppression, malignancy and local infections.^[1]

BOX 2

FRACTURE TREATMENT BY TRADITIONAL HEALERS

The role of the traditional healer is important. In many African countries fractures are frequently treated by a traditional healer, a person who is recognized by the community as competent to provide health care based on cultural, social and religious beliefs. Their methods include reposition, massage of the affected body part to improve blood flow, application of herbs and fixation with wooden sticks, leaves or bandages. Although fracture treatment by traditional healers is very common in large parts of Africa, their methods and outcome have not been well evaluated.

A review from Nigeria regarding the practice of traditional bone setting describes the main complications, which include limb amputation because of gangrene caused by tight wrapping, osteomyelitis, non-union, mal-union and joint stiffness or dislocation^[3].

A survey from Ghana regarding the motivation of patients' decision for traditional fracture treatment showed lower costs, availability in the area and a belief in more expertise among the traditional healers as the main reasons for attending a traditional healer first. Interestingly, in the majority of cases external persons made the decision for the patients, mainly elderly relatives. [2]

Local experience from the Lion Heart Medical Centre in Sierra Leone regarding traditional fracture treatment includes mainly the application of herbs and poor immobilization with wooden sticks. Sometimes hot boiled herbs or burning leaves are applied causing burns leading to an increased risk of infection and osteomyelitis. In severe cases these injuries have resulted in amputation of the limb.



DAPHNE VOOREND, MD
TROPICAL DOCTOR IN TRAINING
CONSULTONLINE@TROPENOPLEIDING.NL

ERDI HUIZINGA, MD
TROPICAL DOCTOR
LION HEART FOUNDATION, SIERRA LEONE

REFERENCES

1. Howe A, Eiff P, Grayzel J. General principles of fracture management: Early and late complications. Up to date, accessed 7-5-2014.
2. Aries M, Joosten H, Wegdam H, van der Geest H. Fracture treatment by bonesetters in central Ghana: patients explain their choices and experiences. *Trop Med Int Health*. 2007;12:564-74.
3. Dada A, Yinusa W, Giwa S. Review of the practice of traditional bone setting in Nigeria. *Afr Health Sci* 2011;11:262-5.

NVTG

Membership of the Netherlands Society for Tropical Medicine and International Health (NVTG) runs from January 1st to December 31st and may commence at any time. Membership will be renewed automatically unless cancelled in writing before December 31st. Membership includes MT and International Health Alerts. An optional subscription to TM&IH carries an additional cost.

Non NVTG members can subscribe to MT through a student membership of the Society for € 23 per year by sending the registration form through our website www.nvtg.org/lidworden or by sending name and postal address by e-mail to info@nvtg.org or MTredactie@nvtg.org.

Contributions and announcements should be submitted to the editorial office by e-mail: info@nvtg.org or MTredactie@nvtg.org. Closing date for N°04 / December 2014: 13-10-2014.

Disclaimer: all views expressed in this journal are of the authors only and are not necessarily shared by the editors of MT. Letters and articles may be edited for purposes of (clarity and) space.

Netherlands Society for Tropical Medicine and International Health

President: A.A.L.J. (Ankie) van den Broek
Secretary: M. Lagro
Secretariat: J.C. Hoppenbrouwer
P.O. Box 82
3738 ZM Maartensdijk
The Netherlands
+31(0)6-53515773
info@nvtg.org
www.nvtg.org

Werkgroep COTG
(Concilium Opleiding Tropische Gezondheidszorg)
en CIGT (Concilium Internationale
Gezondheidszorg en Tropengeneeskunde)
Sluiskade Noordzijde 96
7602 HW Almelo
+31(0)546-451765
cotg@nvtg.org / cigt@nvtg.org

International Health Alerts

THE LATEST EDITION OF IHA CAN BE
FOUND ON THE NVTG WEBSITE

www.nvtg.org