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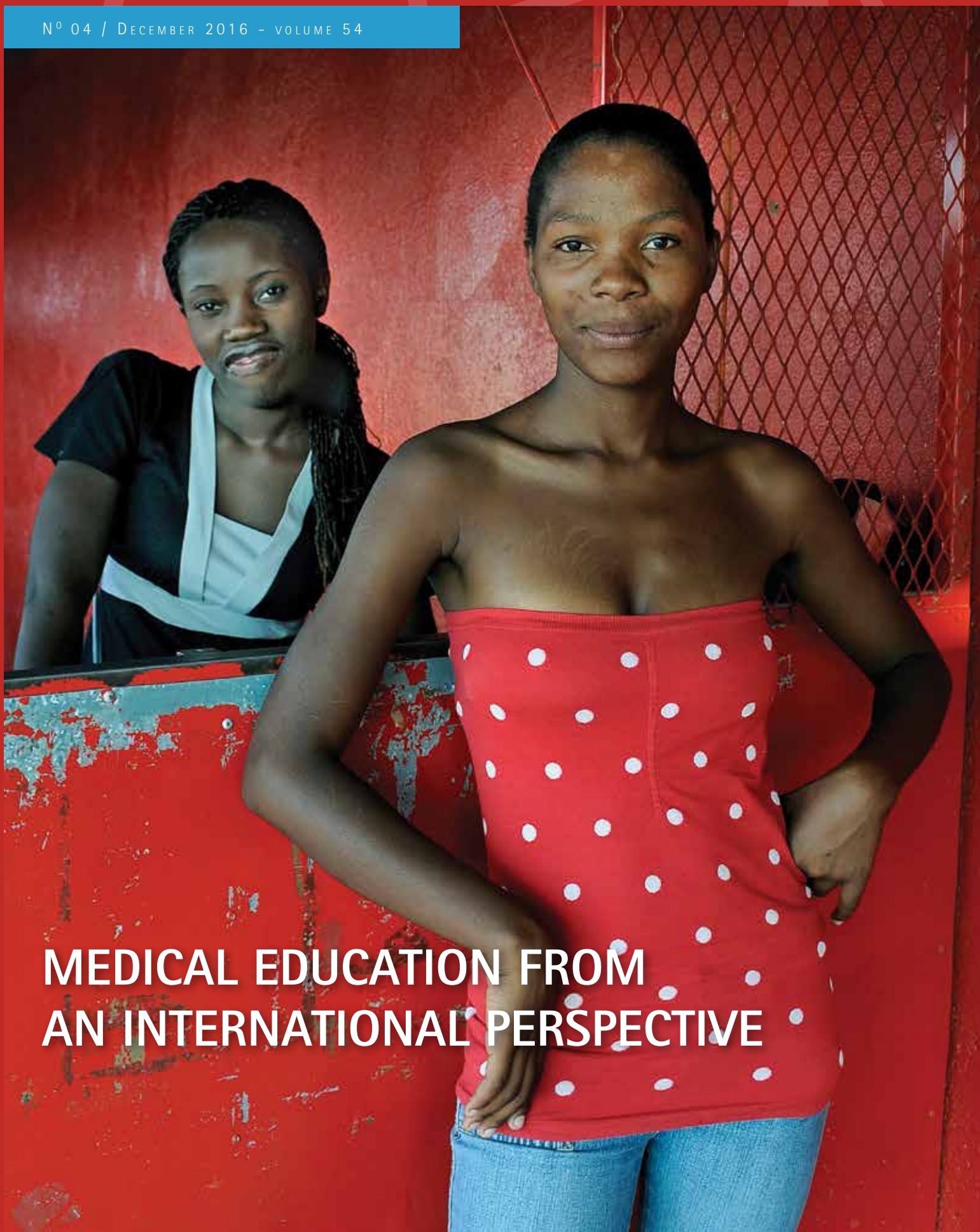

MEDICAL EDUCATION FROM AN INTERNATIONAL PERSPECTIVE

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MEDICAL EDUCATION FROM AN INTERNATIONAL PERSPECTIVE

Medical education in resource-limited settings is essential and challenging at the same time. It is not so obvious whether and to what extent medical curricula should be standardised or adapted to local pathologies. Neither is it straightforward how to take into account that diagnostic and treatment facilities are not always optimal. How feasible is it to provide the number of trained medical doctors required to fulfil the existing staffing norms? Could more tasks perhaps be delegated to non-physician clinicians, such as clinical officers? All populations have the right to the best possible medical care, and medical doctors therefore need to be trained and deployed in sufficient numbers to address the local burden of disease. Some of them, especially those who have many years of professional experience and those who have specialised, need to be involved in teaching in order to build additional local capacity. International collaboration has played an important role in medical education in low-income countries, and it will continue to do so for years to come.

There is quite some variation in the track record and reputation of medical schools. In Africa, for example, the Medical School in Khartoum is over 100 years old, whereas the School of Medicine in Namibia was founded only 7 years ago. The College of Medicine (CoM) in Malawi recently celebrated its 25th anniversary and is widely considered a success story which would not have been possible without international collaboration right from its beginning. In its early years, the CoM received technical, institutional and financial support from the Dutch government. This has helped the college to establish and expand links with various research institutions and other medical schools abroad. In its post-graduate programme, for instance, trainees spend some time in South Africa to further their clinical skills. In this edition of MT*b*, you will read how Maastricht University uses its expertise to help medical schools abroad renew their medical curricula and modernise their teaching methods through the introduction of problem-based learning.

Surgery is a domain in which a lot of international cooperation takes place, often in the form of bilateral collaborations whereby surgeon specialists from Europe or North America use their expertise to conduct surgery in a low-income country and provide surgical training. In this edition of MT*b*, you will read about a special partnership between COSECSA, which represents the surgical societies of 10 countries in East and Southern Africa, and a European partner institution. It is an excellent example of local capacity building in the sub-region, tuned to local circumstances.

Medical doctors and other health professionals wishing to work in a low-resource setting abroad need to be well prepared. But this does not come automatically through their routine training. The Dutch training programme, doctor of International Health and Tropical Medicine ('Arts Internationale Gezondheidszorg en Tropengeneeskunde – AIGT') is unique and internationally well regarded. Even though the AIGT was formally recognised as a specialism a few years back, the programme faced financial uncertainties. The recent award, after a vote in Dutch parliament on December 8th, of Government funding on a structural basis (!) is a significant achievement which NVTG can be proud of. Meanwhile, there is a continued need for evidence of the added value provided by AIGTs with professional experience abroad to Dutch society. The plea of the authors of one of the articles speaks for itself.

Medical education is essential to achieve and sustain national and international development goals, and it thrives through international collaboration.

LEON BIJLMAKERS, ED ZIJLSTRA

Raxaul, Bihar, India

The doctor International Health and Tropical Medicine: time for another leap ahead

For many decades, the Netherlands Society for Tropical Medicine and International Health (NVTG) has provided training in the Netherlands to doctors aspiring to work in low- and middle-income countries. Over the years, the training has professionalized, resulting in the formal recognition, in 2012, of the 'doctor International Health and Tropical Medicine' (doctor IHTM) as a medical specialization, by the Dutch Royal Medical Association (KNMG). In addition, the Commission for the Registration of Medical Specialists (RGS)

recognized the Institute of International Health and Tropical Medicine (IGT), which oversees the implementation of the post-graduate specialization programme. This commission extended IGT's accreditation up to 2021. However, the approval was not unconditional and stipulated modernization and an overhaul of the curriculum to better align it with the training programme.

The professional profile of the doctor IHTM is described in the curriculum (see www.nvtg.org), which allows medical practitioners to equip themselves with relevant skills and knowledge for both resource poor contexts in low- and middle-income countries (LMIC), as well as the Dutch health care system. Doctors IHTM are considered employable in both contexts, and this is supported by their employment track records; for many of them it spans the globe.

The IHTM training programme has been running now for 2.5 years, and it has been professionalized in content and organization compared to the previous programme. The centralized selection of residents works well. The translation of the curriculum into local training programmes is well developed. The residents' electronic portfolios, which include the results of summative and formative assessments, are broadly used, and the residency in resource poor settings has taken shape. In sum, the programme has gradually achieved most of its ambitious objectives.

So is everything in the garden rosy? No, unfortunately not. Financial support for the programme remains painstakingly absent. We had hoped that the formal KNMG recognition, as well as the inherent appreciation of the programme's contribution to medical specialist training in the Netherlands, would result in funding from the budget for medical specialty training of the Ministry of Health, Welfare and Sports (VWS). In response to questions from members of Parliament, the Minister of Health stated that '[the doctor IHTM] is primarily trained to work abroad', and therefore she would not finance the programme.

This answer illustrates that the duality of the training programme is not perceived as a positive aspect. We need to better explain the benefits of a global focus for health service provision – not only in LMIC, but also in the Netherlands. Anecdotal evidence of the added value of international professional experience for the Dutch health care system is no longer sufficient. For those of us who have worked abroad, it is evident how this experience has improved our clinical skills and has enabled us to take into account contextual factors and social determinants that affect health. The recent symposium, 'People on the move', organized jointly by NVTG, Médecins Sans Frontières, Rutgers, TROIE and Uniting Streams, with a chairperson from Pharos Foundation, illustrated this once more. Yet, our policy makers are still to be convinced.

How do we bridge this divide between 'our' and 'their' reality? In part, by building on the foundation laid in 2012, with the KNMG's recognition of the doctor IHTM profile, and by making a better case for its relevance for the Dutch health care context. First, this relevance is echoed by the changing health care context in the Netherlands. Health professionals today serve populations that are different from the ones they served 30 years ago. They increasingly require intercultural competences and skills, including the ability to appreciate a patient's social context. Given the fact that most doctors IHTM will return to the Netherlands after having worked abroad for a few years (two years on average), residents trained in this programme are keen to integrate into the Dutch health care system. Second, we need to provide solid evidence of the added value of IHTM training. It is for good reasons that other Dutch residency programmes – e.g. obstetrics, surgery or paediatrics – often accommodate an internship in a low- or middle-income country to acquire skills useful for the Dutch setting. NVTG is currently conducting a study to quantify the added value for various medical (CANMEDS) competences and invites various stakeholders to provide testimonials. Third, we need to critically reflect on our own training programme and further improve it to increase the value of the doctor IHTM for the Dutch health care system – without compromising its relevance for an LMIC context. We might consider focusing more on public and international health and preventive health promotion, whilst maintaining the clinical role of the doctor IHTM. The added benefit of a doctor IHTM with a global mindset in Dutch medical practice is reflected in a pilot which the IGT institute supports: an internship for residents in a health centre for asylum seekers as part of the IHTM training programme [see also MT October 2016 'The role of the doctor IHTM in the health of people on the move'].

DOCTORS IHTM ARE UNIQUELY TRAINED TO PROVIDE A BRIDGE BETWEEN 'GLOBAL' AND 'LOCAL' AND BETWEEN CURATIVE CARE AND PUBLIC HEALTH, WHEREVER THEY WORK.

Given our changing world, they will continue to be a valuable contribution to Dutch health care. The RGS requirement that the programme be further modernized can become a blessing in disguise and an opportunity to claim the domain of 'International Health and Tropical Medicine' that we aspire to work in even more. In the meantime, we will endeavour to bring forward more convincing arguments to secure sustainable funding for IHTM specialist training.

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Contributing to people's health and strengthening health systems world-wide through Master's education

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How can we structurally improve the health of populations and health systems in countries in Africa, Asia and Latin America? Since 1964 KIT has been doing just that. Via its International Course in Health Development (ICHD), it has been strengthening the expertise and ability of health professionals who work or are going to work in these countries to improve public health there. This course became a full Master of Public Health (MPH) in 1970. In 2005, another Master's in international health (MIH) was added, building on the already existing NTC, Netherlands Course in Tropical Medicine and Hygiene.

WHO PARTICIPATES IN THE MPH AND MIH PROGRAMMES?

The target group for both Master's is slightly different. The MIH targets more medically oriented health professionals, working to build a career in international health. Half of the students are Dutch tropical doctors/ AIGT who would like to pursue their career in global health; the other half are international students. The course is especially suited for people who cannot leave their homes and jobs fulltime for one year. The programme can be taken part time and partially distance based. For many people who work in low and middle income countries with limited funding, this is the best way to combine work and personal developments in the field of international health.

The MPH/ICHD is geared towards health professionals who have more working experience, at the national, regional or district level in governments, NGOs or educational institutions. They need to have managerial experience and come from a broader variety of educational backgrounds. They have worked in countries ranging from Myanmar to Mexico and from Indonesia to Zambia. The group usually consists of more than 15 nationalities.

COURSE CONTENT

The MPH/ICHD starts with epidemiology and statistics, which serve as a basis to explore the social determinants of health. The course continues with modules in health management, policy and systems, and health planning, in which students in groups develop and present a proposal. In the Qualitative methods for health systems research module, students develop their own research proposal. In the Human resources for health module, students discuss issues such as development, motivation and retention of health personnel. Depending on the track, students deepen their competencies in either "Health systems, policy and management" or "Sexual and reproductive health and rights, including HIV/AIDS" or in "Health Systems in Fragile and Conflict-affected Environments". The course concludes with a visit to various organisations in Geneva and a thesis, including an oral exam.

The MIH starts with a core course of 3 months, called the NTC, the Netherlands Course in Tropical Medicine and Hygiene, in which determinants of health, health problems, basic research methods and health systems are discussed. After that, students can choose a large variety of different modules at various institutions in the tropEd network (www.troped.org), including KIT itself. The course concludes with a thesis. The Master course can be done in 1 year fulltime or 5 years part-time. The Master course allows students to build on their existing competencies and to focus on strengthening competencies that they still miss to do their jobs better and to move on with their career. The programme is thus tailor-made for each student. Content can focus on specific health problems, for example non-communicable diseases, maternal or child health, or nutrition. Also, students can choose to put extra emphasis on specific skills for example those related to research, management, monitoring and evaluation, or policy making.

COMPARISON WITH OTHER MASTER'S, INTERNATIONALLY

While most MPHs in Europe focus on their own country, KIT's Master's focuses specifically on low and middle income countries and their challenges,

"Studying at KIT helped me to have a critical mind and to really think out of the box. I work now for the National Cancer Prevention Centre in Zambia. We have screened close to 200,000 women in the cervical cancer programme which has never happened before in this country. Though the incidence and mortality rates are still high there has been massive awareness on the disease. We have also managed to have international recognition on the programme and have trained people from 11 other African countries. I could not have succeeded in all that without the training in public health at KIT."

Sharon Kapambwe from Zambia, MPH, background medical doctor. Currently working as director of National Cancer Prevention Centre

"At KIT I was particularly impressed about the course content, the teaching staff composed of world class public health experts and leading academics and researchers, as well as the support staff whose teaching, guidance and administrative support combined to improve my academic orientation and shape my thoughts about public health and its practice."

Francis-Xavier Andoh-Adjei from Ghana, MPH/ICHD 2010, now working as Deputy Director for Planning, Monitoring & Evaluation and International Relations at the National Health Insurance Authority in Ghana.

"The NTC was a perfect preparation for my work as tropical doctor (AIGT). I was trained in both clinical aspects as more public health related issues by KIT facilitators who had a lot of experience and expertise. This helped me enormously during my work in the field. At the same time it was the start of my knowledge, network and career in international health. Later I studied the Master in International Health and am currently working on research on heart and vascular diseases in the slums of Nairobi, Kenya."

Steven van de Vijver

with a major emphasis on disadvantaged populations, and applying context-specific solutions. Though both Master's programmes can serve as a stepping stone for an academic career, including a PhD, the emphasis is on application of theory in practice. KIT collaborates with all important similar institutions in Europe and abroad.

The Master course in International Health is offered by a number of institutions within the tropEd network. In some institutions of the tropEd network, participants can take a full MIH; other institutions only offer a core MIH course or only advanced modules; see http://www.tropEd.org/institutions/. The KIT MIH has the same requirements for graduation as other tropEd institutions, and the courses are structured in a similar way with a core course, a number of advanced modules, and a thesis. This was made possible by a strong peer accreditation, with common standards [1]. Both programmes are accredited by national and international bodies, such as Dutch-Flemish Accreditation Organisation (NVAO) and tropEd, and have good scores on quality.

MASTER PROGRAMMES PROOF CAREER CHANGING

KIT keeps track of its alumni via alumni surveys and personal contacts. As for the MPH/ICHD, an alumni survey carried out in 2013 showed that, prior to enrolling in the course, most alumni worked for a regional/ provincial or state health department or international NGO or at the national Ministry of Health (18%, 18% and 15% respectively). After graduation, the distribution shifted towards an international NGO, a research institute, or some other institute (33%, 15%, 7% respectively) (see figure 1). Unlike some other training programs, almost all graduates return to their home countries, where they try to make a difference; the quotes below illustrate this. Some started working for international organisations in their own or neighbouring countries. KIT graduates showed high rates of improvement in leadership level (80%) in comparison with MPH programmes in other countries; see figure 2 [2, 3]. Graduates stated that the MPH programme had equipped them with important competencies, such as public health science skills, including analytical assessment (74%), context sensitive competencies (76%) and planning and management competencies (67%).

Surveys among MIH graduates showed that many of them had moved to a new position in their organisation or in the health system; see figure 2. They tend to work more often at the national or international level. After completing the MIH programme, many respondents became active in training/education and/or research. A tropEd-wide alumni survey in 2010 showed similar results [4]. Respondents were asked what they considered the three most important contributions to their current work that they could attribute to the MIH programme. They mentioned improved research skills (54.5%), improved critical analysis/analytical skill (36.4%), and improved knowledge on the field of interest (36.4%). They also mentioned an impact on their networking and writing

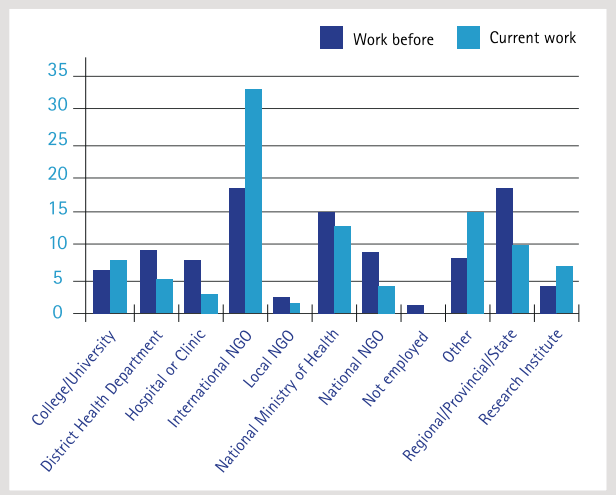

Figure 1: Place of employment before and after MPH/ICHD, alumni survey 2013 of MPH/ICHD graduates

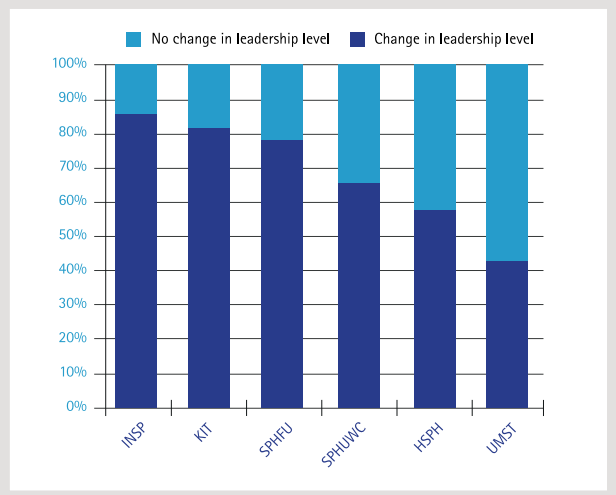

Figure 2: Reported change in leadership level by graduates, % per school, N = 419.*
**Missing: 26*

skills (27.3%). As strengths of the MIH programme, the alumni mentioned the diversity in both background/experience and culture among their peers and the opportunity of networking. The quality of the teachers and their flexibility were also highly appreciated.

IMPACT ON HEALTH SYSTEMS

Quantitative and qualitative studies have shown that alumni make a difference at their workplace and in the health systems where they work. The graduates themselves, their peers, and their supervisors reported positive changes at the workplace level, especially in terms of management, leadership, innovation, teaching and training, advocacy, community engagement and research involvement. Effects mentioned outside of their immediate workplace included an inter-sectoral approach, a national footprint via policy advisory roles for Ministries of Health, policy development, and capacity building [2, 5].

THE FUTURE

The KIT Master programmes can look forward to a healthy future. In conjunction with two other European institutions, project modules and e-learning tracks are being developed via an Erasmus Plus project, so as to respond to the growing demand for courses. Other e-learning modules will also be developed, building on KIT's strengths: small-scale, highly interactive, flexible learning, coupled with substantive field knowledge. It will soon be possible for students to follow the ICHD/MPH part-time. By developing its own fellowship fund, KIT hopes to help and invest in committed students from low-income countries and to strengthen their skills; please see www.kit.nl/fellowships. In view of the 2030 Agenda for Sustainable Development, and its associated goals and international targets, Master programmes in international health and public health will remain relevant for a long time to come.

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Adapt, don't adopt: international educational theory, local practice and the competence of adaptability

Vietnamese skills teacher using a self-made ENT model to demonstrate the examination of mouth and throat, before pairs of students practice on each other.

CHANGING THEORY, CHANGING PRACTICE

Maastricht University (UM) has over 40 years of experience in problem-based learning (PBL). Inspired by McMaster University in Canada, the UM medical school was the first to apply PBL in the Netherlands. PBL was an innovative approach to learning based on the CCCS principles: Contextual, Collaborative, Constructive and Self-directed learning [1]. However, evidence that it actually worked was lacking, which is why so much attention has been paid to evaluating the early years of the medical programme. Were Maastricht students being trained as 'barefoot

doctors', as critics argued? Many studies have been done to compare the performance of graduates of the Maastricht PBL medical curriculum, on various outcome measures, with the performance of those trained at conventional medical schools [2]. Those studies show that PBL graduates seem to possess the same knowledge, yet perform better in diagnostic reasoning and in interpersonal and professional competencies. The lower dropout rate as well as less study delay among UM medical students also hint towards a more efficient training programme.

This has enticed many other medical faculties and other (para)medical training institutions to follow suit. Over the last 20 years, UM has gained experience in helping schools for higher education abroad to realize customized student-centred education in order to improve healthcare worldwide.

The School for Health Professions Education (SHE) at UM has established three branches: (1) the research school where our approach to education is studied; (2) the educational branch, offering a wide variety of courses; and (3) SHE Collaborates (SHE-C), which focuses on international collaboration. The latter branch draws on the expertise in the other two SHE branches.

As former UM students, we (GB and MK) currently teach students and staff – at UM and abroad – as part of the SHE activities. We have been involved in medical educational design in different contexts, from Mexico to Vietnam and from Ghana to Ukraine. These countries are in different stages of socio-economic development, with a variety of human resource and infrastructure constraints that affect implementation of the 'optimal' curriculum. Different health systems and a wide variety in disease patterns require local adaptations in the content of training curricula. In addition, cultural differences may also influence the acceptability of certain educational formats, as well as the approach towards change management.

In a recent study, Frambach et al (2012) conclude: 'It appears that PBL can be applied in different cultural contexts. However, its globalisation does not postulate uniform processes and outcomes, and culturally sensitive alternatives might be developed' [3]. In other words, although the initial request from medical schools is often to help them introduce the Maastricht PBL system, merely copying may not be appropriate, but it may be useful to apply the CCCS principles of learning. These principles can be applied in various formats. e.g. in the form of case-based learning, project-based, team-based or challenge-based learning.

Since PBL was introduced in medical education to replace the existing discipline-based and (systems-) integrated curricula, there have been several further innovations. The shift to outcome and competency-based training curricula was underpinned by competency frameworks developed in different Anglophone countries (e.g. CanMEDS [4], ACGME [5], GMC [6]). In the 2009 framework for Undergraduate Medical Education in the Netherlands [7], the typical CanMEDS competences were adopted, without any adaptation to the Dutch situation (!): Medical Expert, Communicator, Collaborator, Manager, Health Advocate, Scholar and Professional.

In our opinion, the educational format is not so relevant when developing or adjusting medical training programmes. What matters more is how the programme contributes to activating and motivating students, and how it stimulates their curiosity and self-directedness, for example by offering appropriate learning facilities such as medical skills laboratories and continuous assessment for learning [8].

SUPPORT FOR MEDICAL EDUCATION ABROAD

So how does this work? Let's look at some examples. While Maastricht University is widely known for its PBL approach, few people know that it was the medical school that was first to introduce extensive skills training as an essential part of its educational programme. As Pie Bartholomeus, one of the founding fathers of the Maastricht Skillslab, used to say, 'Skills training is competence based education avant la lettre'.

From 2004 to 2011, Maastricht University collaborated on a project to support all eight medical faculties in Vietnam in establishing skills labs [9]. Only two of the participating faculties had a PBL curriculum. Some of the schools trained doctors mainly for work in specialist urban hospitals, whereas others prepared them for work in rural health facilities. Moreover, the eight faculties were quite different in terms of resources, both financially and in terms of staffing. Obviously, it was impossible to apply a 'one size fits all' model. We held a series of workshops to discuss what is involved in developing and implementing a skills training curriculum and skills lab facilities. These workshops 'travelled' around the country with the teachers involved learning with and from each other. This resulted in a national skills training curriculum and a teacher manual with local adaptations in the order and priority of skills trained. The materials needed for skills training (models and manikins) were developed and produced at low cost, using local materials. They proved to be just as effective as the more expensive commercial models, and also in helping students to apply technical procedures and communicate with the patient [10]. Two main lessons were learned from this collaborative project:

- it is important to adapt teaching methods and content to the local context, which can vary enormously even within the same country;
- locally designed and produced training materials are effective and affordable.

In the School of Midwifery in Makeni (SOMM), Sierra Leone, students became involved in producing low-cost alternative models and manikins for their skills training, based on examples from elsewhere (Vietnam, for example), which they would improve. All graduates were trained as preceptors for next generations of SOMM students and some actually later returned as teachers. In this way SOMM is 'growing its own timber'. The lesson learned here is that

the sooner students are involved in adapting the educational process the more sustainable the changes will be.

In an ongoing project in Kenya we are going one step further, co-creating a course on teaching skills with staff from North Coast Medical Training College and UM. Initially this course is meant to serve the needs of medical teachers in East Africa, with the long-term aim of reaching out to medical teachers elsewhere through the networks of the two institutions involved. It may not be possible to offer an identical course elsewhere, but adaptation of the materials developed may be an effective and efficient way to create locally appropriate educational programmes.

CONCLUSION

Working in such varied contexts as described above, we have learned that to be successful as experts, collaborators, communicators, health advocates, scholars, professionals and managers, one overarching competence is lacking in the existing competence frameworks used in medical training: the competence of adaptability, with respect to language, culture and local context.

Merely copying a curriculum that has been successful in one place to another situation does not do the trick. It is more important to apply the right learning principles, and also more sustainable. Maastricht University – through SHE-C – provides guidance, coaching, motivation and technical support to teams charged with the development and implementation of (para-)medical training in other schools, but we cannot make things work for them. Consider the disadvantages of lecture-based training; copying lecture notes may seem a quick and easy way for students to learn, but it has limited value since it will not necessarily lead to real transfer let alone application of the acquired knowledge.

In line with the transition from passive absorption of knowledge via lecture-based education to activating students to full participation, transformative learning is our next logical step [11]. Translated to collaboration in curriculum design within SHE-C, we now aim co-create and co-implement training programmes from which not only our partner schools will benefit, but our own medical school as well. In order to achieve that, first and foremost the competence of adaptability needs to be nurtured, among students as well as staff. Even though educational models may have proven to be successful in a particular situation, when applying them to a different context the motto should be, 'Adapt, don't adopt!'

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Students producing placenta models for use in skills training at the School of Midwifery, Makeni, Sierra Leone.

The College of Medicine in Malawi: 25th anniversary

The College of Medicine campus

The College of Medicine (CoM) was established in 1991 and was until recently the only medical school in Malawi. Each year, 60 students graduate. In 2004, the CoM started its postgraduate training programme (Master of Medicine). Two other faculties (Biomedical Sciences and Public Health) were established recently. Research has always played a pivotal role in teaching and is the focus of various international collaborations. Strong leadership and political commitment have been instrumental for success. Human resources continue to be a problem, but increasingly staff and management positions are filled by Malawians.

There was no medical school in Malawi before the College of Medicine (CoM) was established in Blantyre in 1991. Students used to be sent to medical schools in neighbouring countries and later on overseas, in particular to the UK, Australia, South Africa and the USA. Many did not return after graduation, and it was felt that the medical training received overseas was not appropriate for a doctor working in an African setting [1].

The curriculum at the COM was introduced gradually. Because of the shortage of academic staff and infrastructure, students initially went abroad for the first study years and completed their clinical rotations in Malawi. After the basic science departments were established, the full curriculum could be delivered in Malawi. In 1998, the first students who had been fully trained in Malawi graduated. The curriculum was based on the traditional UK format and was reviewed by external consultants in several curriculum conferences.
It is a 5-year programme that leads to a Medical Bachelor and Bachelor of Surgery (MBBS) degree. In each study year, students are exposed to community medicine, which plays a dominant role in the curriculum. There is a dedicated campus for this in Mangochi, one of the country's rural districts. After another 18 months of internship (under the umbrella of the Ministry of Health), the doctor can register with the Medical Council of Malawi.

In 2008, the curriculum was reviewed and transformed into a more integrated format with early exposure of students to clinical sciences. In 2010, a second main campus was opened in Lilongwe (capital of Malawi) for teaching the third-year students, thus relieving pressure on the main campus in Blantyre.

In 2003, the first postgraduate programme was introduced (Master of Public Health). In 2004, the College, with support from the governments of the Netherlands, Norway and Sweden, started other postgraduate programmes in various clinical sciences: the Master of Medicine degrees in Internal Medicine, Paediatrics, Surgery, Obstetrics and Gynaecology, Anaesthesia and Ophthalmology. These programmes comprise a part I and part II (two years each) as well as a dissertation on a research project. For all components, an external examiner from outside Malawi is invited for quality assurance. Several Royal Colleges in the UK provided support for this initiative.

In the part I period of training in Malawi, the students work as registrars in their respective departments. The CoM is affiliated with the Queen Elizabeth Central Hospital (QECH), which has the status of a teaching hospital. Throughout the two years, time is also reserved for formal teaching. After passing the part I examination, students spend a specific period of time abroad in a country with the highest standards in clinical specialties. This is necessary because the current support services at QECH are not of a sufficient standard to provide adequate exposure and experience. South Africa is the obvious country of choice because it is a Southern African Development Community (SADC) neighbour and the disease patterns are similar to those in Malawi. In addition, South Africa also has 'Western diseases' and relatively high standards in medicine. Significantly, visas for South Africa are only granted for the duration of the training, after which it is impossible to stay. The trainee is therefore likely to return to Malawi.
All posts are supernumerary and were initially funded by the Netherlands and later by the National AIDS Commission

(NAC). This policy ensures that students can have positions as registrars with similar duties and learning opportunities as their South African counterparts, rather than being mere observers. After returning to Malawi, they prepare for the Part II examination and write their dissertation on a research project. Once graduated, they find positions as medical specialists in various departments, pursue an academic career, or become teachers themselves.

Recently, family medicine was introduced into the curriculum, and preparations are being made for a postgraduate programme.

In recent years, two more faculties were established under the College of Medicine, the Faculty of Biomedical Sciences and allied Health Professions, and the School of Public Health and Family Medicine. There are now degree programmes in physiotherapy, pharmacy, health services management, and medical laboratory sciences as well as upgrading degree programmes for clinical officers [2]. Increasingly, students from other (African) countries are being admitted to the CoM.

Recently (2015), a second medical school was established in Lilongwe by the Daeyang Luke University [2].

From the time the CoM was first established, academic staffing has heavily depended on expatriates. The clinical departments have been supported for many years by the Netherlands Ministry of Developmental Collaboration. In 1999-2001, for example, there were nine Dutch specialists appointed as teachers in the departments of Internal Medicine, Surgery, Obstetrics & Gynaecology and Anaesthesia. After 2001, an exit strategy was implemented with support for development of the postgraduate programme that also included improved infrastructure of the CoM clinical departments situated at QECH.

RESEARCH

Throughout the years, research has been a pivotal activity in the CoM curriculum, with dedicated time for student projects and formal teaching in research methodology. International collaboration, such as in the Malawi-Liverpool-Welcome Trust Clinical Research Programme and the John Hopkins Project, has been crucial in the development of the CoM. In addition, many research studies carried out in these collaborations have been instrumental in improving clinical care for patients throughout the country and beyond. The College has established the College of Medicine Research and Ethics Committee (COMREC) which assesses research proposals according to the highest international standards [3].

In 2006, the Research Support Centre was opened with the goal of building research capacity, supporting clinical trials, managing data, facilitating research, and administering grants [2]. In 2013, an impressive new library was opened to accommodate the teaching needs of around 1500 students.

CURRENT SITUATION AND CHALLENGES

The College graduates about 60 medical doctors per year, and there are 20-30 non-medical graduates. In the post-graduate programme, there are 3-5 graduates per clinical specialty each year. [2] These numbers are too low to meet the demand, and it is still not possible to have the full postgraduate training in Malawi. One important restriction is the lack of adequate diagnostic facilities (laboratory, radiology, pathology, microbiology) in the QECH, although major improvements have been made.

Migration of doctors after graduation or specialization continues to be a threat. The lack of career development perspectives, research opportunities, and a realistic pay package that covers housing, transport and school fees for children are important contributing factors [4,5].

Although junior and senior positions have been taken up by well- trained Malawians in all departments, academic staffing remains problematic and is still dependent on expatriates. The clinical departments struggle with limited facilities and depend on the limited capacity of QECH support services. This has a negative effect on undergraduate and postgraduate

Department of Medicine at Queen Elizabeth Central Hospital; teaching students is an important objective during the morning hand-over.

teaching, as well as on clinical service delivery. Patients with complex conditions sometimes travel abroad, mainly to South Africa or India, often at their own expense and in some cases with support from the Ministry of Health [2].

CONCLUSION

The CoM is a success story, and this is the result of good management and political commitment. Increasingly, key positions in teaching and administration have been taken up by well-trained Malawian doctors and academics. While the economic situation in Malawi remains a matter for concern, there is good reason to assume that the next 25 years will be equally successful.

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Building the surgical workforce in Sub-Saharan Africa: the RCSI/COSECSA Collaboration Programme – a best practice model for institutional partnership

Worldwide, five billion people lack access to safe, affordable surgical and anaesthesia care when needed [1]. Sub-Saharan Africa has the highest ratio of surgical disability adjusted life years (DALYs) lost (a measure of the overall disease burden) and the highest rate of obstetrical complications in the world [2]. It is estimated that the provision of essential surgical procedures would prevent 6-7% of deaths in this region [3]. The most significant barrier impeding the provision of surgical care in Sub-Saharan Africa is the shortage of trained surgical providers. In the COSECSA countries there are 1,690 qualified surgeons for 320 million people, a ratio of about 1:190,000 or 0.53 surgeons per 100,000 [4]. In the long term, only regional organisations can address this deficit.

THE COLLEGE OF SURGEONS OF EAST, CENTRAL AND SOUTHERN AFRICA

The College of Surgeons of East, Central and Southern Africa (COSECSA) was established in 1999 to advance education, training, examination standards, research and practice in surgical care by increasing the number of appropriately trained, well qualified surgeons. COSECSA offers a common training programme and standardised examinations across ten countries: Burundi, Ethiopia, Kenya, Malawi, Mozambique, Rwanda, Tanzania, Uganda, Zambia and Zimbabwe.

COSECSA provides independent and internationally recognised training programmes in General surgery and six surgical specialties: Orthopaedics; ENT; Urology; Paediatric Surgery; Neurosurgery and Plastic Surgery. COSECSA training consists of a common two-year membership (MCS) programme followed by a three year (or four in the case of neurosurgery) specialised fellowship (FCS). In-service training is supplemented by mandatory short courses and e-learning.

PARTNERSHIP WITH RCSI

The collaboration between COSECSA and the Royal College of Surgeons in Ireland (RCSI) commenced in 2007. The RCSI/COSECSA Collaboration Programme (the Programme) aims to leverage the resources and expertise of RCSI to enable COSECSA to increase the quality and availability of essential surgical care in the East, Central and Southern Africa (ECSA) region. This goal is accomplished through the existing COSECSA activities with the input of RCSI resources and expertise. The objectives leading to this goal are outlined in Table 1.

RCSI/COSECSA Programme Objectives:

1. Establish adequate COSECSA administrative capacity to carry out all the functions of an international standard surgical training college and ensure COSECSA's sustainability.
2. Expand and enhance surgical training programmes for COSECSA MCS and FCS candidates.
3. Expand and enhance basic surgical training programmes for non-surgeons.
4. Enhance and quality assure COSECSA's examinations processes.
5. Cement COSECSA's place as the hub of surgical training information and professional development in the ECSA region.

Table 1

The programme is supported by Irish Aid (the Government of Ireland's Development Fund) and RCSI itself in the form of staff time and resources. This includes curricula, education tools, skills training, examination, accreditation, and quality assurance processes.

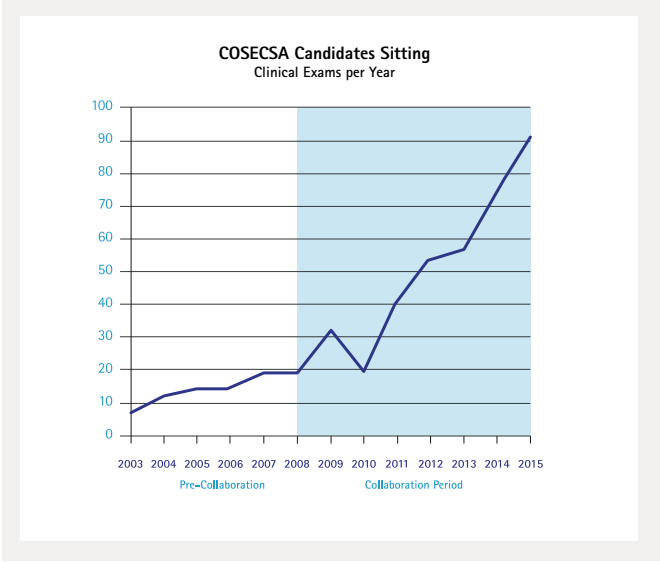

Figure 1

ACHIEVEMENTS OF THE PARTNERSHIP

COSECSA, with the support of the Programme, has now become the largest surgical training institution in the region in which it operates. Since the first fellowship exams in 2004, 158 FCS specialist surgeons have graduated. Each graduate performs on average approximately 300 operations per year, giving a total of 47,400 operations performed regionally each year by these graduates.

As of November 2016, COSECSA has over 400 surgical trainees in 48 training hospitals (see Figure 1). This number now approximately equals the combined number of those enrolled in postgraduate surgical training programmes in all 24 universities in the region that offer such qualifications. In fact, COSECSA now has significantly more surgical trainees than RCSI, although with a fraction of the resources and staffing.

Most importantly, RCSI and COSECSA have worked in partnership to put in place many of the elements needed for long term sustainable functional independence. This includes:

- Train the Trainer courses delivered to all COSECSA trainers: 212 surgeons trained in 17 courses in 10 countries; 28 master trainers trained. This part of the training programme was awarded the Irish Institute of Training and Development's Corporate Social Responsibility Award 2016.
- Basic Science Faculty development: 27 surgeon basic scientists completed a three-year training programme.
- Establishment of an in-depth database with a profile of every surgeon in East, Central and Southern Africa.
- Development of an online interactive map – in the International Collaboration for Essential Surgery (ICES) – which assists all stakeholders in surgery in the COSECSA region by showing the precise location of every surgeon in the ten countries of the COSECSA region and much more. (www.cosecsa.org/global-surgery-map)
- Mobile optimized logbook which allows all COSECSA trainees to record their operative experience. Vital for assessment and quality assurance, this is the largest repository of surgical trainee operative data in Sub-Saharan Africa.
- Establishment of Africa's only surgical training e-learning platform and development of a WHO e-learning tool for basic surgical training for non-surgeons.
- Support for the development of Women in Surgery Africa (WiSA), a peer support group that promotes, facilitates and enables women surgeons to take up leadership roles and positions in the COSECSA region.
- Provision of one of a kind mobile surgical skills training unit with surgical simulation technology, used to provide training in Tanzania and Kenya.

- Over 100 general medical officers trained in essential surgical training techniques in rural Zimbabwe, Zambia and Rwanda.
- Ongoing monitoring of retention rates of surgical graduates across the COSECSA region.

SUCCESS FACTORS

The success of the RCSI/COSECSA Programme is determined primarily by the fact that it is driven by COSECSA. It works within existing structures and with regional qualifications, as this is the most effective way to improve and expand surgical training.

The programme is institutional, not personal. It is not led by any one individual. Dedicated staff in both RCSI and COSECSA are fundamental to implementation of programme objectives. Ensuring a strong working relationship between RCSI programme staff in Dublin and the COSECSA Secretariat staff in Arusha, Tanzania, is key to the partnership.

Joint oversight is also critical. The Programme is overseen by a Steering Committee made up of Irish-based and African-based committee members. It also draws on the diverse expertise of RCSI departments including Surgery, Examinations, Anatomy, Pathology, Physiology, Information Technology, Communications, Media Services and the Institute of Leadership. The Programme reports twice annually to Irish Aid and three times annually to the Steering Committee. In addition, independent external evaluations were commissioned in 2010, 2013 and 2016.

RCSI and COSECSA emphasise the importance of administrative collaboration and training, as well as the establishment of an information management system. This helps consolidate the institutional knowledge developed over the lifespan of the partnership and beyond.

Income generation is fundamental to the work of COSECSA and to ensuring its long-term sustainability. RCSI and COSECSA work together to mobilise resources and continue the growth of COSECSA. This includes engagement with national ministries of health to secure permanent funding. In 2016, the Government of Ethiopia pledged an annual budget line to COSECSA. RCSI and COSECSA are also engaged with a wide range of other international donors and partners with a view to programmatic development.

CHALLENGES

Challenges which have impeded the pace of progress of the Programme include 1) weak healthcare infrastructure in COSECSA constituent countries; 2) limited availability of equipment and of personnel to attend trainings; and 3) weak communication systems.

CONCLUSION

RCSI and COSECSA consider that only regional institutions can deliver a truly sustainable surgical training. Increased investment by government and international donors in local surgical training initiatives is critical to empowering local institutions and addressing the surgical workforce shortage. Partnership between peer institutions can help consolidate such investment through shared learning and quality assurance of the training and the examination processes. RCSI and COSECSA have demonstrated that a long-term reciprocal partnership creates a solid foundation for the development of high quality training in, and provision of, surgical care in Sub-Saharan Africa. The success of this model underlines the value of long-term partnerships between North-South institutions and may be used to inform the development of other much needed cadres of health workers in this region.

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Think of lack of zinc in breastfed infants with skin rash

Case 1

Case 2

SETTING

We report two cases from a rural health clinic in Namatanai, in the New Ireland province of Papua New Guinea. The clinic has an inpatient ward with 40 beds, very basic diagnostic facilities and a small operating theatre. The nearest referral hospital is a five hour drive. During rounds, two patients with a similar skin eruption caught the attention of the doctor in charge.

CASE 1

A male infant, 2 months old, had presented at the outpatient department with stomatitis and diffuse erythema. It had started 6 weeks before as a facial rash, but had disseminated to cover the whole body. On examination, symmetrical erythematous patches and plaques were observed, mainly in the body folds and facial area. The child seemed uncomfortable on touching the lesions. The mother had been using 5 different creams (mostly local herbs and plants) without success.

Both the patient and his mother tested positive for syphilis (using the VDRL test), for which they were treated. Following admission in the hospital and treatment with oral flucloxacillin, intravenous hydrocortisone and betamethasone cream, the eruption seemed to improve. However, after a while, the extent of the rash was found to increase.

CASE 2

The second case was similar, concerning a 4 month old girl. She presented with conjunctivitis and an acute rash in the diaper area, which had spread to the trunk and face within a week. There were erythematous papules on the trunk, along with periorbital, perinasal and perioral patches and plaques. As in case 1, the eruption seemed to arise particularly in the body folds. The child was irritable on examination. The patient had tested negative for syphilis, contrary to her mother. She had been hospitalized for 2 days and had been treated with oral flucloxacillin, betamethasone cream and ophthalmic tetracycline. To date, there had been no improvement. Both cases were term infants with unknown birth weight; both were receiving breast milk. There was no evidence of growth impairment, malnourishment, diarrhea, alopecia or recurrent infections.

SPECIALIST ADVICE

The dermatologists were asked for advice on diagnosis, treatment and prognosis. Three dermatologists responded to this enquiry.

Their differential diagnosis included (seborrheic) eczema, allergic reaction to local ointments, intertrigo, malnutrition, and zinc deficiency. The advice was to continue betamethasone cream (diluted with vegetable oil, as betamethasone alone would be too strong for these young children) and to start zinc supplementation. The lesions were not found to be typical for syphilis. Nevertheless, the advice was to treat, as neonatal syphilis cannot be excluded simply by negative testing.

TREATMENT

Both children were started on zinc supplementation (zinc sulfate, tablets, 10mg daily). Betamethasone cream was diluted and continued. After 2-5 days, both patients recovered completely.

BACKGROUND OF ZINC DEFICIENCY

ZINC METABOLISM

Zinc status depends on several factors, including bodily stores, dietary intake, absorption and endogenous losses[1]. Zinc is found in animal products such as meat and milk[2]. 30% of ingested zinc is absorbed by the duodenum and proximal small intestine [2,3]. Zinc is secreted from the body mainly by the gastrointestinal system and the kidneys.

ETIOLOGY OF ZINC DEFICIENCY

Zinc is an essential mineral. It plays a role in protein, carbohydrate and vitamin A metabolism and is needed for growth, development, cell proliferation, healing and tissue repair [2-4]. The recommended daily dosage of zinc varies according to age. 17% of the world population is estimated to have a low dietary intake of zinc, particularly in developing countries [3].

Acquired zinc deficiency is principally seen in breastfed infants. Zinc content of breast milk physiologically declines in the first months postpartum, from >3mg/L to <1mg/L after 6 months [1]. Therefore, the infant will need other sources of zinc (e.g. complementary foods) to meet daily requirements. Particularly prone to zinc deficiency are premature infants, as they have smaller liver zinc stores, lower absorptive capacity and larger intestinal and renal losses. Other risk factors for acquired zinc deficiency are diseases with decreased absorption and increased secretion of zinc, such as celiac disease, cystic fibrosis, short gut syndrome and liver disease.

The most important congenital form of zinc deficiency is acrodermatitis enteropathica (AE). It is an autosomal recessive disorder, resulting from a partial block in zinc absorption in the intestines [1]. Several genetic mutations have been found to cause AE. Symptoms typically commence after the infant is weaned off the breast, as absorption of zinc is decreased in bovine milk as compared to human breast milk [4,5].

Another genetically based zinc deficiency has a maternal lactogenic origin [1]. Mutations in zinc transporters localized in the mammary glands lead to an inability to secrete zinc in breast milk. Therefore, low zinc concentrations are found in breast milk despite a normal maternal zinc status [1].

CLINICAL FEATURES AND DIAGNOSIS

Acquired and congenital forms of zinc deficiency are clinically indistinguishable [5]. They are characterized by growth impairment, loss of appetite and recurrent infections (due to immune deficiency) [1]. The classic triad of AE consists of diahrroea, alopecia and acral and periorifical dermatitis, but this triad is only present in 20% of all patients [2]. Skin disorders include eczematous or erythematous lesions and ulcerations, predominantly occurring periorally, periorbitally, in diaper regions and on the extremities. Paronychia, onycholysis, stomatitis and conjunctivitis may be found. Other clinical features include apathy, irritability, photophobia and hypogonadism [2].

Determining zinc levels in serum remains the gold standard for diagnosing zinc deficiency. However, this biomarker has several limitations. It fluctuates with meals and time of day, has low sensitivity for detecting marginal zinc status, acts as a negative acute-phase reactant to inflammation, and samples can be contaminated by skin or collection materials [1]. Therefore, recognizing clinical features and taking a thorough history (including feeding history and potential gastrointestinal pathology) is imperative.

TREATMENT

Oral administration of zinc is the treatment of choice, regardless of the origin of zinc deficiency. Zinc sulfate is best tolerated, although zinc can also be administered as acetate, amino acid chelates and gluconate [2]. An initial dose of 5-10mg/kg/day is usually recommended, followed by a maintenance dose of 1-2mg/kg/day[2]. Dosage should be increased during pregnancy and adolescence [2].

Duration of treatment depends on clinical response and pathophysiology. Supplementation can be discontinued after resolution of symptoms, but should be lifelong in patients with AE. The effect of zinc administration will become apparent after 24-48 hours, with skin disorders improving and resolving completely within 2-4 weeks [2,4].

Adverse effects of zinc are rarely seen with small dosage and short treatment. However, with prolonged duration of treatment, gastro-intestinal symptoms such as nausea, vomiting and hemorrhage can arise [2]. Furthermore, high serum levels of zinc can result in hypocupremia, warranting monitoring of copper levels throughout treatment.

TAKE-HOME MESSAGES

The tropical doctor in charge formulated three lessons from these cases. Start zinc supplementation in any child with a skin disorder. Use vegetable oil to dilute betamethasone for small children. Ask mothers about local ointments and treatment previously used.

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The Practice of Internal Medicine in the Tropics

GOOD NEWS FOR ALL TROPICAL DOCTORS (IN TRAINING): POCKET SIZE INTERNAL MEDICINE AVAILABLE!

When preparing for clinical work in the tropics, internal medicine can be quite a stumbling block. Internal medicine is not the favourite topic of many tropical doctors, since they are mainly trained in the surgical specialties. But it's important to know the basics, especially when working at a rural district hospital where medical ward rounds are part of a doctor's responsibility.

So, what do you do with a 51-year-old man with paralysis of the legs, or a 22-year-old female with recurrent need for blood transfusion? How do you apply all the knowledge about HIV, TB and parasites you got from text books, which is so hard to retain?

Ed Zijlstra, internist and teacher in Rotterdam, was Head of the Department of Medicine in Malawi (Blantyre) for many years. He compiled 100 clinical cases, primarily as a study tool for Malawian medical students, but also for expatriate doctors preparing to work in a tropical setting. The cases are presented in the way the patients present to you: starting with the anamnesis, physical exam and additional investigations (if available), including pictures. Each case description ends with 2 or 3 questions, mostly about diagnosis and management. The answers are provided (when you flip the page), followed by a short discussion of the topic and ending with some learning points. The book has an index which allows searching for diagnoses as well.

The cases are not polished but reflect practical realities, such as poor-quality X-rays and inaccurate or missing lab results. Part of the medical training in tropical settings is geared to dealing with such situations. The case titles are engaging and trigger further reading, for example 'A man who was struck at the back of his neck (he thought) …'. Due to the quiz-like structure of the book, the concise writing and the illustrative pictures, it reads like a novel. The only disadvantage is that it doesn't literally fit in the pocket of your white coat. But then again, you probably had the other Zijlstra already (the Clinical Book*). This new book is good for a perfect read at home or during not so busy hospital shifts. A must-have for all doctors (preparing for) working in a tropical setting!

*D. Sloan, T. Phiri & E.E. Zijlstra, The Clinical Book, ISBN 9789081571920

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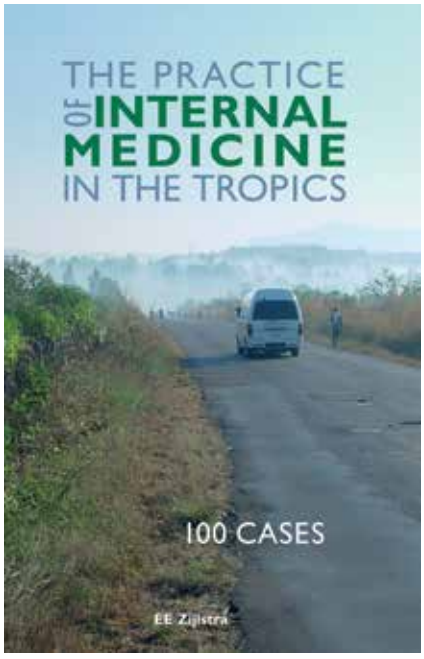

E.E. Zijlstra
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