

Community dermatology

Focus on dermatopathology in developing countries

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Introduction

The main inspiration for this text has been several articles about community dermatology written by Terence Ryan and discussions with him over three years at the CME at the Regional Dermatology Training Centre (RDTC), Moshi, Tanzania. I will focus on dermatopathology, a fundamental diagnostic step in dermatology which unfortunately is completely lacking in many developing countries.

The RDTC has also provided the infrastructure necessary to support a Dermatopathology service and this will be discussed also as an essential component required by any one setting up the means for biopsies of the skin to be taken by health workers in resource poor countries.

Ryan's introduction in this CD, prepared for the 22nd World Congress of Dermatology in Seoul, draws attention to the scope of dermatology, the nature of its work force, the qualifications that are desirable, and the deficiencies and impediments that characterize solutions worldwide. These will be addressed in the context of dermatopathology.

Advantages of having Dermatopathology in developing countries

Dermatopathology has a long history, the term dermatopathology was coined in 1792 by Henry Seguin Jackson, one hundred years later many books about dermatopathology were available worldwide (Mehregan), but now two-hundred years later, the reality is that dermatopathology is still lacking in many countries of the developing world. Those countries have limited to no access to dermatologists, pathologists, or histology and laboratory services. A trained dermatologist or dermatopathologist is available in only 14% of countries (Tsang). We urgently have to remedy this sad state of affairs.

A correct diagnosis is mandatory as physicians. Skin biopsy, together with clinical evaluation, is one of the most important steps of dermatological diagnosis, it should not be done only by the elite but by everybody. Moreover it is cheap and the organ of concern (the skin!) is superficial and accessible.

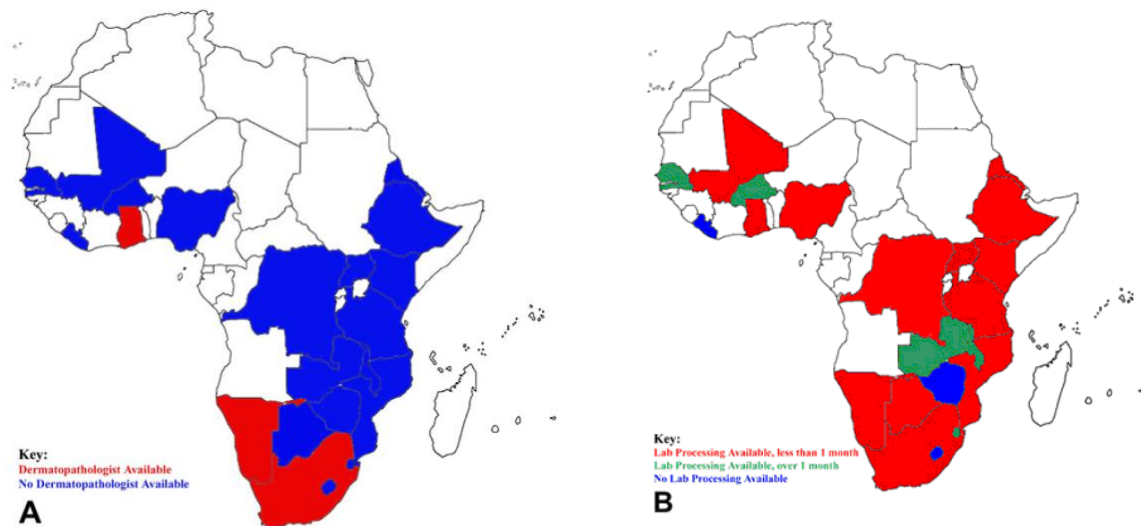


Figure from Tsang *et al.*, J Am Acad Dermatol 2010; A. Availability of dermatopathologist by country. B. Availability of processing services by country.

The thought of forming a Taskforce to get Dermatopathology into most developing countries, may induce many skeptics. Even to those involved, it may seem foolhardy to introduce histological laboratories into Africa where the primary health needs may seem to be of an entirely different nature. In reality, however, Dermatopathology has certain characteristics that make it particularly suitable for the needs of developing countries: costs are low, particularly when compared with other diagnostic procedures (Faravelli), and efficiency rates are much higher. The belief that the African is unsuited is not a sufficient reason for depriving this continent of such a valuable facility.

Why is dermatopathology a sustainable solution? To answer that question one can refer to WHO analyse of the reason why many countries do not reach better health standards: three fundamental, interrelated problems restrict countries from moving closer to universal coverage: the first is the availability of resources, the second is an overreliance on direct payments at the time people need care, and the third impediment is the inefficient and inequitable use of resources.

Investments into dermatopathology is a sustainable diagnostic skill fulfilling the first problem of bringing a resource where there is none. It is also a solution to the second aspect, as financial support of dermatopathology means that the patient from poor countries should not pay (or should pay only a symbolic amount) for the biopsy and the laboratory costs should be taken over by sponsoring grants. “When a population has access to prepayment and pooling mechanisms, the goal of universal health coverage becomes more realistic” [WHO World health report 2010]. The patient gets a diagnosis (first gain) and as a consequence not an ineffective treatment (second gain) and also no payment (third gain), thanks to the accurate diagnosis he gets a correct treatment (fourth gain) and he can go to work because of recovery (fifth gain), avoiding unnecessary impoverishment (sixth gain) – all these gains with only one investment: a diagnostic histopathology laboratory. That means this is a very efficient use of resources, and in this way also a solution to the third impediment specified by WHO.

Dermatopathology brings a further solution to another issue formulated in the WHO World health report 2010: “Removing the financial barriers implicit in direct-payment systems will help poorer people obtain care, but it will not guarantee it. Recent studies on why people do not complete treatment for chronic diseases show that transport costs and lost income can be even more prohibitive than the charges imposed for the service. Moreover, if services are not available at all or not available close by, people cannot use them even if they are free of charge.” The solution is that skin biopsy can be done within the community by trained CBHWs working in rural areas, avoiding in this way travel costs which again increase poverty. This is a simple way to bring high technology to the poorest.

Costs of one biopsy in western world/developing world:

Physician	50USD	5USD
Laboratory technician	3.5USD	0.5USD
Biopsy costs	4.5USD	4.5USD
Laboratory costs	1.2USD	1.2USD

	55.7USD	6.2USD

As discussed in our study (Beltraminelli et al., manuscript in production), during the last 5 years in the RDTC, there was an average of 315 biopsies per year. The numbers are increasing (500 biopsies in 2010). Most of these biopsies taken in the RDTC are performed by CBHWs during their training. Looking at the costs listed above, with 3000 USD per year supports a steady state, but with 5-10'000 USD per year one could support further development of dermatopathology at the RDTC.

The following is a list of situations/diseases where dermatopathology is a simple and specific, mandatory diagnostic step to achieve the correct diagnosis:

- tumor differentiation: melanoma, SCC, BCC, Kaposi sarcoma, Merkel cell carcinoma, lymphoma
- tropical infections: leishmania, mycetoma, chromomycosis, lobomycosis, zygomycosis, mycobacteria, bartonellosis, lepra
- HIV related infections: histoplasmosis, cryptococcosis, blastomycosis
- vasculitis
- drug reactions – erythema multiforme, Stevens / Johnson, toxic epidermal necrolysis
- characterization of inflammatory conditions

Arguments against high technology in developing countries state that these technologies have often no consequences for patients. One example is a CT scan for tumor diagnosis when there is no possibility to treat the tumor surgically because lack of infrastructure, know-how or both... But in dermatology it is different, in developing countries most diagnoses can be treated with improvement in skin health. For example, virtually all cutaneous carcinomas and melanomas are curable if diagnosed early. Thus there is a window of opportunity by making a skin biopsy in patients where these tumors are suspected, particularly in population groups where genetics have played a devastating role in those families who carry the trait of albinism. In Tanzania alone there are more than 100'000 albinos who, living under the equatorial sun, are highly susceptible to the development of skin cancers due to solar radiation. A skin biopsy can reduce delay of diagnosis and result in appropriate therapy, as has been shown by Lockwood (Lockwood) in cases of leprosy even in UK and it accounts for fewer missed diagnoses when patients are seen by dermatologists rather than orthopaedic surgeons or neurologists. Skin smears for leprosy are

quick, easy and reliable though safety issues in the HIV era require double gloving and the WHO has discouraged this valuable investigation.

Departments focusing on Leprosy have provided the background to and indeed proof of the effectiveness of the taking of biopsies in the most difficult of environments using procedure trained health workers at sites well away from the best equipped centres. Thus, the Cochrane Centre in the department of Dermatology Oxford received thousands of biopsies from trials of Multi drug therapy, examined 15,000 specimens (MacDougall) sent to the London Leprosy Centre for evidence of disease other than leprosy. Developed the packaging systems for safe transport of infected material (Jones) and studied locally available alternatives such as honey to preserve skin biopsies for routine histopathology as well as immunopathology (Bassam Ziena). Biopsy taking should be in the curriculum of a CBHW working near the bottom of the health care pyramid. In Africa there are now more than 200 CBHWs trained at the RDTC able to do skin biopsies, with their work they treat patients individually finding also solutions for the community. A skin biopsy can prove the existence of a disease, being the starting point of a supporting program. This happened to CBHW trained at the RDTC, Ibrahim Vandi who proved the existence of Buruli ulcer in 15 patients in Sierra Leone after doing simple biopsies of the skin and sending them to Europe for PCR analyses. Skin biopsy is a simple technique with a great impact on diagnosis and treatment of patients with so little harm. Dermatopathology is a benefit and not only a need.

Dermatopathology's effectiveness is shown best where there is an infrastructure to support it. The future of dermatology depends on achieving appropriate and essential infrastructure, staffing, technology, drugs, and learning materials, within available financial resources. To accomplish this, dermatologists must talk more persuasively to those who support projects and govern large funds. Demonstrating the benefit of delegation of skin care to purpose-trained auxiliaries, nurses, or medical assistants is essential

The Background Political Scenario

Promoting and protecting health is essential to human welfare and sustained economic and social development. This was recognized more than 30 years ago by the Alma-Ata Declaration signatories, who noted that Health for All would contribute both to a better quality of life and also to global peace and security. The World Health Assembly resolution 58.33 from 2005 says everyone should be able to access health services and not be subject to financial hardship in doing so. On both counts, the world is still a long way from universal coverage. It was expected that humans should have the possibility to lead a socially and economically productive life. It is too bad, that most actions ignored the importance of the skin to achieve the concept expressed in 1981, of "Health for All" [Ryan 1994]. Furthermore, in the same year, delegates from some 90 National dermatology societies met in Berlin at the World Congress of Dermatology and launched the International Foundation for Dermatology (IFD). This was done in the knowledge that three billion people in 127 developing countries are deprived of even the most basic care for their skin disease. The International Committee of Dermatology (ICD), the executive body of the International League of Dermatological Societies (ILDS) proposed, in 1997, the concept of "Healthy skin for All".

The first step to achieve "healthy skin for all" in developing countries is the concept of community-based health workers (CBHWs). CBHWs are a variety of health workforce who are selected, trained within a subspecialty (as dermatology, ophthalmology, obstetrics), having a shorter education than physicians, and working in rural and semi-urban settings within communities. This new concept is working well in many developing countries reaching goals

that have been taught as unattainable. Twenty years ago it was thought unthinkable that CBHW would be equipped and able to and equipped to take a skin biopsy. Today this is already part of history.

The Task Force for Community Dermatology was launched in May 2009 by the International Society of Dermatology (ISD) at its International Congress in Prague. One of the objectives of Task force is to record benefit and prove capacity because there is lack of recognition of how successful dermatology is in managing a huge range of conditions. The fact that many dermatological problems can be solved by low cost strategies has a reputation bringing with it low prestige within those who are impressed by the soaring costs of high technology. In political terms low mortality of dermatological diseases has always been a problem (Chen, Hay, WHO Report 1998 and 2006). On the other hand countless skin diseases in the developing world lead to poverty. For many reasons the poor die young. Therefore a case can be made that care of the skin alleviates poverty and prolongs life.

Funding organizations that currently provide 22 billion dollars per annum to control malaria, TB and HIV/AIDS, sometimes with and sometimes without outstanding success, should learn that a fraction of such money given to organizations concerned with skin care would so improve well being and participation that even many killing diseases might be better managed. Besides, poor leadership of our profession by dermatologists has never brought the necessary attention of skin problems into the main debate of WHO and governments when money is to be dispensed. Skin care in the developing world should be integrated within the general health services, as outlined at the Alma Ata conference, as primary health care including political, social and economical interventions aimed to reduce poverty (Morrone).

The Task Force argues that the acquisition of dermatopathology skills is not an extra game and falls well within the scope of poverty alleviation.

Community Dermatology - Primary Health Care – An Opportunity

Serving the community means meeting its needs.

The concept of Primary health care includes universal access by populations, equality of provisions of health care, full community participation, the comprehensive nature of national health systems, and intersectoral coordination. Community dermatology concerns populations of individuals rather than individuals in a one to one relationship.

In most parts of the world, the family is the only social support system available, when the patient cannot leave the community, outreach programs should be done. It has been repeatedly empathized that 70% of diseases in developing countries could be appropriately managed at the primary health care level (Khatami, Ryan 1994), especially for common skin diseases. Dermatological disorders are among the five most common causes of disease and loss of manpower in rural areas, in which the largest percentage of the population, namely 80% still lives. The few trained dermatologists in most developing countries are generally based in cities (George).

The secret of well functioning community dermatology in countries where there are no dermatologists is the delegation of work to the CBHWs. There are some duties that can be done by CBHW whatever the local situation (Buxton), those are patient's consultations in the community and in health centers, organization of community oriented health programs inclusive of providing information on health issues to the community, (for example education programs of

groups of patients so that skin disfigurement or albinism are not a principal cause of being unwelcome), instructions in wound and burns care or the preparation of emollients. Such management of health issues is not esoteric but reflects the reality of the 18-years experience of the RDTC in Tanzania. CBHWs trained for two years at the RDTC are able to compound some of and prescribe most skin treatments they need, manage wounds, leprosy and sexually transmitted diseases. As became clear from follow up of graduates of the RDTC, Performing skin biopsies is safe and effective and improves diagnostic acumen (Ryan 2000).

Communities should be able to analyze their particular situation identifying and prioritizing particular local needs. The participation of the community in planning, programming, implementing and evaluating health issues is a key principle. Emphasis must be given to community-based epidemiologic studies, especially to define priorities and to assess the impact of interventions. Scabies is a practical example where dermatology is most appropriately managed as a community problem.

Referral center – Center of excellence

There should be at least such a center of excellence for a community of 100 millions of people or in a radius of 3'000 kilometers. In other words in a better world sub-Saharan Africa would have 5-10 similar centers. The centers should offer high quality dermatology care for out- and inpatients needs. Those centers should be as independent as possible, have physicians in fix term employment as consultants, and others employed in a residency training program as well as a teaching program for CBHWs. The assignments of such centers are referral for patients with any skin diseases and particularly for difficult skin diseases, training doctors and CBHW specialists to disseminate dermatological knowledge, supporting the state in public health questions. From the point of view of the infrastructure they should have a decent building or a part of it, outpatient rooms, operating theatres, a small laboratory for bedside diagnostic (KOH, Giemsa, Gram, Ziehl Neelsen for diagnosis of dermatomycosis, gonorrhoea, scabies, pediculosis, lepra, herpes), and wound care facilities. They need administrative offices, phone lines, mobile phone lines, and internet access. They also need vehicles for outreach programs.

As described in several accompanying articles in this series Information Technology is playing an increasingly important role. Intercontinental telemedicine with respect to dermatopathology was pioneered between Tanzania and Switzerland proving its benefit (Schmidt).

Even under climate change and the reduction of carbon fuel consumption access to expertise by the patient, or the biopsy need no longer be by air or road.

Investment in good infrastructure is one of the main steps in every development project. Mandatory is also maintenance of all these components with regular supply of consumable medical supplies (biopsy punches, gauzes, bandages, laboratory solutions...).

From the point of view of therapeutic options they should have a pharmacy with facilities to produce emollients, sunscreens, basic topical treatment (topical steroid creams, salicylic acid in vaseline, coal tar...), and facilities to store liquid nitrogen.

From the cultural point of view, centers of excellence should be as near to the community as possible (opening times, infrastructure, location...). A very important subject is identification of positive effects of traditional medicine and to assimilate it into the system. Delivery of care should be done in a culturally acceptable manner.

Since developing countries are really “developing” and some of them are already “developed”, we have to consider that centers of excellence should also regularly train dermatologists. These doctors in future will be running a small health centre or a dermatology ambulatory in their region or country of origin and could be involved in training of CBHWs or other health personal. Because the purpose of this paper is also to emphasize that centers of excellence should includes dermatopathology facilities , we should remember that competence in dermatopathology analyses are still in the hands of medical doctors and only by training many of them, does one occasionally develop curiosity for dermatopathology. At the moment of writing in whole East Africa, there are only two physicians interested in and who have knowledge of dermatopathology!

A success story: Regional Dermatology Training Centre in Moshi, Tanzania

In Moshi - a small city on the slopes of the Mount Kilimanjaro - in the 1960s the Good Samaritan Foundation in partnership with the Tanzanian Ministry of Health created a large regional hospital, the Kilimanjaro Christian Medical Centre (KCMC), today linked to the local Tumaini Medical University. In 1992 the IFD decided to build the Regional Dermatology Training Centre (RDTC) at the KCMC. From the administrative-political point of view, the RDTC is a pan-African reference centre for dermatological diseases – and a WHO designated “Collaborating Centre for Dermatology, Sexually Transmitted Diseases and Leprosy”(Ryan, 2000).

The RDTC is constantly growing, so that physicians and CBHWs of the RDTC take care of more than 13,000 patients with skin diseases per annum. While most patients are seen in the RDTC there is some others outreach to the community in the villages (Community Dermatology). Moreover the RDTC responds to new challenges, these are:

(a) The education of CBHWs (Dermatology Officers = Community Dermatologists) who follow a 2-years curriculum (Diploma of Dermatology Degree of the University of Dar es Salaam) with yearly 10-15 attendants. CBHW are well prepared paramedical workers from different African countries (more than 12), working in villages and in rural areas (Ryan 1992). Since 1992, more than 200 completed their education at the RDTC and returned to their African country of origin.

(b) Another challenge of the RDTC is the education of Dermatologists, since 1992 nine specialists have been trained, and eight are now in training. It is a four year specialist training in dermatovenereology (MMed) which is now recognized for specialist accreditation by several African countries.

(c) The third challenge is the instruction of medical students from the local Tumaini University in Moshi.

(d) The RDTC organizes yearly in January a conference of continual medical education (CME) of the graduates trained during the last 2 decades. Other participants to the conference are physicians (mostly dermatologists), from more than 10 African countries and from the western world (Austria, Belgium, Brazil, Canada, France, Germany, Great Britain, Holland, Italy, Spain, Switzerland, United States).

With time other facilities such as a library with most important literature and internet access, a pharmaceutical compounding unit, a basics microbiology laboratory, a student hostel, accommodation for visiting teaching faculty have been added. One of the latest projects is a new inpatient ward, which will be linked to other facilities such as a plastic surgery and skin-burned

unit. The creation of histopathology laboratories for rapid processing skin biopsies must be further developed, biopsy processing is already possible in the institute of pathology of the KCMC hospital. It is against this background, that since many years, CBHWs have been taught to take biopsies of the skin.

Similar successful stories related to community dermatology happened in Mali, rural Mexico, Cambodia, Patagonia, North India (Newsletter N12/2010 ISD). At the time of writing, there are numerous excellent models but little funding to reduplicate them.

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