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OPHTHALMOLOGY IN A TROPICAL ENVIRONMENT

RESEARCH, TREATMENT AND CURRENT ISSUES



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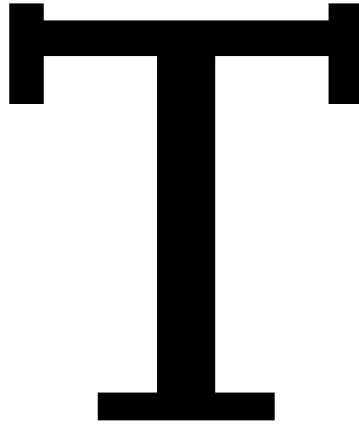
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OPHTHALMOLOGY IN A TROPICAL ENVIRONMENT



The working group Tropical Ophthalmology of the NVTG is grateful for the opportunity to share some of its thoughts with the readers of MTb. Of course this is a selection. Some other issues are paid attention to in the upgrade of the Memisa Eye Special 2002, such as traditional eye medicine, diabetes and many more subjects. These articles will become available soon on the website of the NVTG (www.nvtg.org).

Many Dutch ophthalmologists are active in low-income countries. Often they operate within non-governmental organizations (NGOs) in the field of eye care. Additionally regularly personal initiatives are taken. Meanwhile national trainings in ophthalmology and eye nurse and refractionist trainings have been established in various countries and national staff are responsible for most of the specialized eye care. So we cannot offer a complete overview.

The available time for ophthalmology in the training for Doctor International Health Care and Tropical Medicine (AIGT) is limited. With this issue we hope to show that with more knowledge of ophthalmology the AIGT will feel more confident in the field of eye care. Questions can always be asked via Tropenconsult-on-line.

In recent years a shift in eye pathology has been seen in low-income countries. In this issue this shift is described and

two articles highlight an important cause, the aids epidemic. It is outlined how the ophthalmological world thinks to improve the quality of sight in local settings (Vision 2020). There is a special article about the care for children. An example is given of how a simple action in the field can reduce blindness. All articles put emphasis on what workers in the frontline can do. Therefore the practical use of a simple ophthalmoscope is explained. An important role for front line workers can be to help in the field of logistics as in the case of low vision. We hope that this issue will enthuse to let the world look brighter for all, especially for the ones who are less privileged.

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Vision 2020, the Right to Sight: What can a general medical officer do?

Examination by a cataract surgeon at the Nekemte Eye Clinic in Nekemte, Ethiopia (2009)

This article focuses on what a general medical officer can contribute to VISION 2020 in a low-income country. VISION 2020: the Right to Sight initiative, was launched in 1999 by the eye care INGOs, and endorsed by WHO. The ultimate goal is that by the year 2020 all "avoidable blindness" will be eliminated, through prevention or treatment. 20/20 stands for full visual acuity of 6/6 or 1.0.

The action plan has four essential pillars:

- Intervention strategies for most common eye conditions that cause avoidable blindness
- Human resource development with emphasis on mid-level eye care personnel
- Adequate supply of infrastructure, equipment and instruments
- Advocacy





PRIORITIES

The following five eye conditions were selected as priorities:

1. Cataract
2. Trachoma
3. Onchocerciasis
4. Childhood blindness
5. Refractive errors and low vision

These conditions are essentially bilateral and can be successfully and cost-effectively prevented or treated. Glaucoma and diabetic retinopathy are not on the priority list, because these are more difficult to diagnose and to treat, especially in less developed countries. Trauma, although often resulting in blindness in the affected eye, is not on the list either, because most traumas are unilateral and therefore do not cause blindness in a person.

1. CATARACT

Every survey shows that about 50% of all blindness is due to age-related cataract. Surgery for cataract is one of the most successful medical interventions. It can rehabilitate an elderly blind person or secure jobs for people with early cataract in just 30 minutes surgery time.

What you can do: Visit the nearest facility for cataract surgery, get to know the conditions and costs of surgery and make arrangements.

ORGANIZATION OF CATARACT SURGERY

There are two options. Firstly, a team can visit regularly as part of their outreach work and take patients with them for surgery at their base. This removes the important barrier of long travelling for the elderly. Secondly, surgery can be done as an "eye camp" at your hospital. The team will usually carry all necessary equipment, consumables and IOLs (Intra-ocular Lens), so that you only have to offer an examination room, operating theatre (OT), sterilization, beds for 1-2 nights, some laboratory facilities, and some supporting staff. Depending on the population in your area, the capacity of your hospital and the capacity of the surgical team, a visit once or twice a year may be sufficient. Best are fixed timings, taking the farming seasons and local festivities into account. The criteria for patient selection are to be discussed with the surgical team. Good publicity through various channels is of the utmost importance. Follow-up will usually be done through your hospital. It is important to monitor the outcome of cataract surgery. WHO suggests as one of the guidelines after six weeks: an uncorrected poor outcome (VA of < 0.1 ($< 6/60$) in $< 5\%$ of the operated eyes with age related cataract). Poor outcome under field conditions is in reality often 10-15% but should not be higher.

Cost of surgery may be subsidized through Service Clubs, such as Lions, local business people or philanthropists. Sometimes

the surgical team has funding, or the health insurance will pay. Some contribution by the patient should be encouraged.

As cataract develops slowly and patients gradually get used to impaired vision, they will not present at the Out Patient Department (OPD) by themselves, so the problem of cataract blindness is underestimated. However, after good publicity, the attendance for a cataract surgical camp can be overwhelming.

In health education programmes, do give attention to "painless and gradual loss of vision in the elderly", as surveys show that, in remote areas, many elderly blind and their relatives are not aware that cataract blindness can be 'cured'. Display posters with pictures of happily smiling patients after cataract surgery.

Ideally you should have a small eye clinic with a trained eye nurse.

2. TRACHOMA

Trachoma is common in the dry and dusty areas of sub-Saharan Africa (SSA). The aim is to achieve elimination of blinding trachoma as a public health problem by 2020. The SAFE strategy of Surgery, Antibiotics, Facial cleanliness and Environmental changes is driving this. In some countries mass azithromycin distribution and water and sanitation programmes are carried out through GET 2020 (Global Elimination of Blinding Trachoma). As a result, the numbers of new infections have considerably decreased. In the absence of a mass distribution programme, individual patients, often young children, should be treated with tetracycline eye ointment, twice daily for 6 weeks.

Meanwhile, more patients with trichiasis - eyelashes scratching on the cornea - are identified. Trichiasis is the late result of repeated Chlamydia infections. Women are affected more than men.

In case of trichiasis / entropion there are two options:

Eyelid surgery, to evert the inward-turned lashes and lid margin. This can be learned through the excellent surgery training DVD (English & French) through Teaching-aids At Low Cost (TALC) (1). Trained eye nurses often do trichiasis surgery.

Epilation of the eyelashes as soon as they are felt, either by patients themselves or by a close family member (2). This has to be done lifelong! In areas where trichiasis is common, the tweezers are often locally made. Provided epilation is done well, it protects the cornea from scarring.

3. ONCHOCERCIASIS

APOC (African Programme of Onchocerciasis Control) runs a successful programme 'Community Directed Treatment with Ivermectin' (CDTI), in oncho-affected regions. The number of people developing vision loss due to onchocerciasis has already markedly decreased. Community distributors, who hand out the ivermectin -once or twice a year- can sometimes be involved in other interventions as well.

4. CHILDHOOD BLINDNESS

In the past, corneal blindness was the main cause of blindness in children in poor countries. This was due to Vitamin A deficiency, often triggered by measles, and made worse by traditional eye medicines. Wider coverage of measles vaccination, and better nutritional status, with/without high dose Vitamin A mass distribution to under-fives, have greatly reduced corneal blindness. Main causes of blindness in children today are retinal diseases, often hereditary and untreatable, and congenital or developmental cataract.

Children with cataract should be referred as soon as they are diagnosed, preferably to a tertiary paediatric eye department, as treatment in children is much more complicated than in adults (see Courtright in this issue).

5. REFRACTIVE ERRORS AND LOW VISION

Uncorrected refractive error (URE) is the most common cause of visual impairment worldwide. Do try to provide simple refraction and prescription of glasses. Studies show that children in rural areas, in SSA in particular, will have only few refractive errors⁽³⁾. In Asia myopia is more common, especially in cities and among students from middle class families. School screening programmes are most effective if carried out among urban lower high school students (10-15 yrs).

However, there is often a high demand for reading glasses in people aged over 40 and sale of standard reading glasses may be a great service and can also create some income for the hospital. Prescription goes by age, with a simple reading test (e.g. newspaper) or threading a needle.

Guidelines for reading glasses:

- 40-45 yrs S+ 1.25
- 45-50 yrs S+ 1.5
- 50-55 yrs S+ 2.0
- > 55 yrs S+ 2.5 – S+3

If there is a blind school nearby, be aware that often half of the children or more are not 'blind' but rather 'low vision'. Many students can greatly improve with proper refraction and strong reading glasses or loupes, in order to read print rather than Braille (see the article by Karin van Dijk).

In 2013 the World Health Assembly (WHA) passed a resolution that in 2019 visual impairment should have decreased by 25% from the baseline in 2010. Particular focus should be on cataract surgery and correction of refractive errors, as these constitute 75% of all visual impairment!

ACTION AT LOCAL LEVEL

Actions at local level are 1) arranging cataract surgery, 2) providing antibiotic treatment and lid surgery for trachoma, 3) creating awareness to refer any blind or severely visually impaired

child, whatever the cause, to a paediatric eye unit and 4) providing a refractive service or at least standard reading glasses; all this will contribute greatly to the success of VISION 2020.

With a torch, an ophthalmoscope, a vision chart and a trial lens set, you can diagnose and act on most of the VISION 2020 priority conditions.



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Further reading

<http://www.iapb.org/vision-2020>

www.cehjournal.org/changing-patterns-in-global-blindness-1988-2008/

www.who.int/blindness/GLOBALDATAFINALforweb.pdf

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The shift in potentially blinding eye disease before and during the AIDS pandemic in Cameroon

LEAVE YOUR CLINICAL IMPRESSIONS IN THE CLOAKROOM

This I learned at the DTM&H (Diploma Tropical Medicine & Hygiene) course in Liverpool. Facts, numbers, statistics are of importance. However, to illustrate what happened to eye diseases in a tropical environment, I will compare my clinical impressions in the seventies in Cameroon, before the AIDS-era, with those in the present time in the same region.

THE SEVENTIES

In 1970, when I started as a general practitioner in the hospital of Ndoungué in the south-western part of Cameroon, only one ophthalmologist was active in the country. This meant that general tropical doctors had to cope with eye diseases. After a short and intensive period of training at the Rotterdam Eye Hospital and equipped with basic optic instruments, I was able to examine and treat eyes. A growing number of eye patients found their way to Ndoungué, located in a region hyperendemic for onchocerciasis, also called river blindness in cases where eyes are involved. Onchocerciasis is caused by the parasite *Onchocerca volvulus*, a nematode worm that is spread by the bite of an infected Simulium fly. The fly needs rivers for its life cycle.

In 1976 skin snips were taken at the outer canthus of the eye, to detect the microfilariae (larvae) of the *O. volvulus*. We found 458 out of 4832 eye patients

positive (10.5%)⁽¹⁾. The density of the microfilariae escaping from the skin snip at the outer canthus of the eye correlates with ocular involvement⁽²⁾. Nowadays onchocerciasis in Cameroon is decreasing, due to the annual treatment with ivermectin supported by the African Programme of Onchocerciasis Control (APOC).

In the seventies measles and malnutrition were also serious public health problems in Cameroon. In 1976, 49 children with severe keratomalacia (necrosis of the cornea in measles) were hospitalized in Ndoungué⁽³⁾. Due to the successful measles immunization corneal blindness in children is no longer a public health problem. The same is true for malnutrition, in the seventies not a rare finding but thanks to under-five clinics and education it has largely disappeared.

In 1978, after returning to the Netherlands I specialized in ophthalmology. But regular visits to Cameroon and Tanzania, kept me involved in tropical ophthalmology.

CAMEROON REVISITED

During recent visits to the Manna Eye Clinic in Nkongsamba, nearby Ndoungué, I rarely observed ocular signs of onchocerciasis in young people. Skin snips in this clinic are no longer done, due to the risk of HIV transmission.

Nevertheless, I recently saw an 18-year-old man who had optic neuritis in both eyes and many microfilariae in the anterior chambers. He came from a region where annual ivermectin distribution is active. He must have missed his treatment.

On the other hand: In 1978, in Mangamba, a nearby village, nearly all the children between the age of 10-12 years had a kind of ocular onchocerciasis⁽³⁾.

Now there was a ten-year-old boy from Mangamba who didn't have any sign of onchocerciasis in skin or eyes: at present this village is involved in onchocerciasis control activities.

Success in onchocerciasis control is obvious, but elderly people with ocular scars in the cornea and retina will still visit eye clinics, also in the regions declared free from *O. volvulus* transmission.

Nowadays it is remarkable to see the number of patients with intra-ocular inflammation, notably uveitis.

In October 2013 at the Manna Eye Clinic the number of uveitis cases during 8 days were registered, new cases and controls. In this short period 470 eye patients were examined, among them 235 new patients; 29 of the new patients had uveitis; 12 were female, 17 male, age between 20-75 years. One of the severe uveitis patients, a man of 36, was receiving antiretroviral therapy and could be a case of Immune Recovery Uveitis⁽⁴⁾. The HIV status of other new patients was not known. This observation of 29 new uveitis patients among 235 new patients, 12%, during 8 working days in 2013 may represent an increase compared with the 6% of new patients who had uveitis in the same region in 1976⁽¹⁾.

Another observation is that in the pre-HIV era of the seventies in Ndoungué examination of the fundus of the eye (retina, choroid and optic nerve) was rarely obscured by opacities in the vitreous. But at present fundus examination in the same region is quite often hindered by dense vitreous opacities caused by vitritis associated with uveitis and possibly also with AIDS and opportunistic infections.

UVEITIS UNDERESTIMATED

In her thesis 'Uveitis in Africa' (1996), Ronday⁽⁵⁾ postulates that intraocular

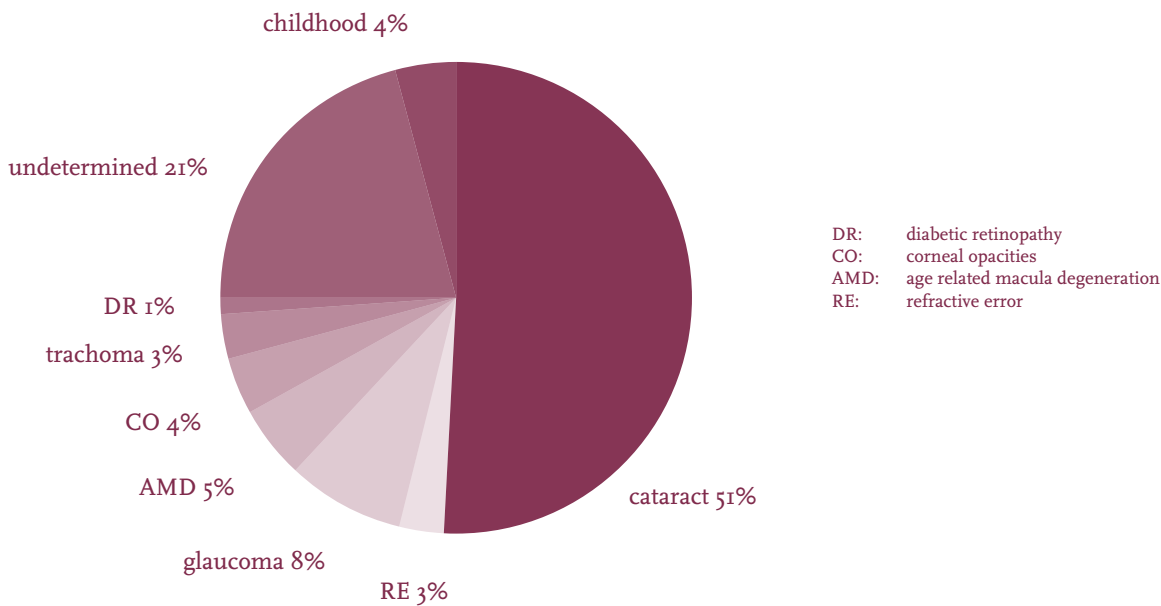


Fig. 1 Global causes of blindness as percentage of global blindness in 2010
 Source: S.P. Mariotti, WHO

inflammation should be added to the list of principal causes leading to blindness on the WHO Eye Examination Record used in blindness surveys. HIV/AIDS, opportunistic eye infections and immune recovery uveitis are not mentioned in blindness surveys in the analysis of causes of vision loss worldwide 1990-2010 by Bourne (6). They must be hidden in the category “undetermined”: in West, Central and Southern Africa about 35% of the causes of blindness(6).

At times in the Manna Eye Clinic a patient, not yet aware of being infected with HIV, asks for medical care because of eye complaints. Equally eye patients are not always open about having AIDS. In a busy clinic a trustworthy person should talk with the patient alone, in a confidential setting, to emphasize the need for HIV testing and for regular medication and controls. In resource-poor circumstances of low-income countries the training of physicians, nurses and laboratory personnel in order to create a multidisciplinary approach of ocular disease in AIDS, will be extremely difficult. A step forward would be the easy availability of a quick and reliable HIV-test adapted to simple circumstances. Moreover it is of great value to increase the awareness and the

knowledge of blinding uveitis and possible AIDS involvement in eye pathology among physicians and nurses confronted with eye complaints.

CONCLUSION

During the last three decades the main causes of blindness as measured in population-based surveys may not have changed due to HIV/AIDS, but the pathology presented to the ophthalmologist in eye clinics in South West Cameroon certainly has.



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CHILDHOOD BLINDNESS AND VISION LOSS IN AFRICA



Vision loss and blindness in children is rare, even in Africa. While accurate estimates are not available, it is likely that, in most of Africa, less than one child in 5,000 is blind.⁽⁴⁾ That said the impact of vision loss and blindness in childhood can be significant; on the children, their families, and societies at large the impact can endure for decades. Due to successful vitamin A supplementation and measles immunization programmes in many countries, corneal blindness has reduced significantly. As a result most incident blindness and vision loss in children is no longer preventable; instead, it is a mix of treatable and untreatable causes. The major treatable

causes include congenital or developmental cataract, glaucoma, and refractive error.

TREATMENT CATARACT NOT EASY

The etiology of congenital or developmental cataract in many of these children remains poorly understood. While rubella, a treatable condition, does contribute to some cases of congenital cataract, evidence suggests that its contribution is not more than 20%. Managing the present causes of blindness and vision loss in children requires sophisticated services to provide good quality surgical, medical, and optical interventions. Also, these children require comprehensive care throughout their childhood in order for them to achieve their full visual potential. Unlike cataract surgery in adults, managing cataract in children is a lifelong undertaking. The links between the health care services and educational services need to be strengthened to ensure that these children achieve their educational potential. One aspect of dealing with childhood vision loss is still true: children with serious eye disease need to be seen by a qualified eye care provider as soon as possible because of amblyopia prevention. In many countries, particularly in eastern Africa, "Child Eye Health Tertiary Facilities" (CEHTF) have been established at key tertiary hospitals, each striving to serve a population of approximately 10 million.⁽²⁾ These facilities need to be staffed by well-trained paediatric ophthalmologists, paediatric anaesthetists, optometrists, low vision specialists, and Childhood Blindness & Low Vision Coordinators. Ideally they will have strong links to the communities they serve in order to identify children in need of services as well as to ensure that children receive adequate health and educational follow-up.

WHAT DID WE LEARN

Experience gained suggests that:

1. Key community members (key informants) can be very effective in identifying and referring children in need of eye care services. Studies in a number of countries have demonstrated the impact of this approach and training manuals have

been developed and disseminated.⁽³⁻⁵⁾

2. Less success has been demonstrated in using general health workers to identify and refer children, whether through routine clinic activities such as immunization, or through community campaigns.^(4,5) Currently, the knowledge and skills of general health workers regarding childhood vision loss is generally weak.⁽⁶⁾ Every district hospital in Africa should have at least one trained clinical person dedicated to eye care. Their role is crucial to ensure that a sufficient diagnosis is made and proper referral done. They should have a strong relationship with the CEHTF both for referral and for follow-up.
3. Where possible children need to be referred to a CEHTF for proper assessment and treatment. Since children require long-term follow-up, which may be difficult to always carry out at the CEHTF, a plan of action, tailored to each child and the clinical and educational environment needs to be adopted. This is one of the tasks of the Childhood Blindness & Low Vision Coordinator, who works alongside clinical personnel.

WHAT IS IMPORTANT FOR THE GENERAL PRACTITIONER

For general clinicians working in Africa, some recommendations include:

1. Find out where the nearest CEHTF is located, visit the facility, and establish a relationship with the relevant personnel.
2. Assess the current knowledge and skills of eye care personnel in the area related to child eye health and provide upgrade training, as needed.
3. Insert short educational messages in training of general health workers, particularly on the need to refer children, regardless of age, with serious eye problems to the relevant eye care providers as emergencies.

4. In collaboration with the CEHTF consider conducting key informant programmes in the area.
5. Do not forget vitamin A or measles related blindness; if corneal opacity secondary to vitamin A/measles is detected, this should be a trigger to report to health authorities. Corneal opacification is the “tip of the iceberg” and indicates a serious public health problem.

Continuing to reduce the burden of vision loss in children in Africa requires good planning, a comprehensive approach, good partnership, a strong link between all sectors of the health care services, a viable system for follow-up, and engagement with the educational sector. Only by including all these aspects will children be able to achieve their best visual and educational potential.



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How to help provide low vision care for children

Children with low vision often do not receive appropriate clinical low vision interventions because eye care staff do not know how to improve (the use of) their limited vision or regard them as blind. Low vision is functionally defined as 'having irreversible visual loss that seriously reduces the ability to do many daily activities'. If a person has any useful vision, they should be considered low vision, and not blind. This is an important distinction to ensure that any remaining vision is used as much as possible and people are not unnecessarily labelled as 'blind'. This is especially important when assisting children. Up to this day, children in many low-income countries are being taught Braille, regardless of their vision level, when attending special schools or resource centres/annexes attached to mainstream schools, partly because they are labelled 'blind'. When you are faced with a person whose vision cannot be improved to normal levels and thus is low vision (formally defined as: visual acuity does not improve beyond 6/18), it is important to first check that everything possible has been done to improve their vision medically.

1. Has their diagnosis (and prognosis for vision) been confirmed by an ophthalmologist or other eye care worker?
2. Has all the medical and surgical treatment possible already been given? If not, these activities need to be organized first.

HELP FOR LOW VISION

Subsequently the following needs to be done to assist someone with low vision:

- Listing vision related problems and needs: what does the person need and would like to do again, that he or she cannot do anymore because of poor vision.
- Refraction: It is important to check if they have recently been refracted and got correct distance or presbyopic spectacles, and are they wearing them? It is recommended to refract again. Measuring near vision, without and with full correction (elderly people need to wear their presbyopic correction). You might find for example that the near vision level of a child is good enough to read the print schoolbooks in primary school with new distance spectacles. Alternatively they might need simple magnification, such as a pair of 'magnifying' glasses (high + spectacles) of, for example, + 4.0 Dioptres to read print of the required size. Deciding on all interventions: prescription of new dis-



tance spectacles, non-optical interventions (such as light), magnifying devices.

- Obtaining and payment of spectacles and low vision devices. A simple prescription does not guarantee a child or adult will obtain the spectacles and will use them.
- Organizing follow-up for further training and support at school, or at a rehabilitation programme; for example training in the use of devices and in mobility.
- Organizing annual follow-up, especially for children: they might need new distance spectacles and the ability to read smaller print sizes in higher grades. One 'easy' way to find children with low vision is to visit schools where children with disabilities are known to be enrolled. The first thing to do is ensure that all children with visual problems in these educational facilities receive a thorough eye examination and refraction.

WHAT KIND OF HELP

How especially children with low vision can be helped is illustrated by the following examples. Vision assessment of 222 children with possible low vision (not amenable to further surgery and treatment) enrolled in 12 resource centres in Tanzania showed the following main causes of low vision (unpublished data): 36% Retina-related, of these 78% had albinism 23% Lens-related, of these 48% had pseudophakia. The majority is likely to benefit from refraction (and new distance corrections), especially the many children with albinism. (fig. 1) Their vision-related performance will also benefit from simple interventions such as caps, umbrellas, sunglasses and their health will benefit from clothing covering arms, legs and neck. Children with aphakia and pseudophakia often benefit, in addition to distance spectacles and an optical device for near activities such as reading, from good light on their reading and writing tasks. Most important: children operated for cataract need annual follow-up. Vision assessment of 663 school children in Nepal (unpublished data) attending different types of educational services (including local schools) showed that refractive errors were the main cause of low vision (29%), followed by lens related conditions (22%).

RESULTS OF REFRACTION

Refraction improved distance visual acuities substantially (of course only if the children also obtained the required spectacles!): Before refraction, 66% of children had (very) poor vision (<6/60), after a thorough refraction, only 35% remained in this category. Many of the 65% with a visual acuity of 6/60 – 6/18 (after refraction) could now use their improved vision for reading the blackboard (seated in the front row) and almost all of these children could now access print. These potential

vision improvements, as a result of a good refraction were also observed in children in other Asian countries (1). The near vision of these children improved by distance glasses (the most common intervention!), non-optical interventions and/or magnifying devices: 82% reached small to large size print levels (was 62% before interventions). Only 7% still had very poor near vision after eye care assessment and interventions. Many children learned to use Braille unnecessarily, regardless of their vision level, and after assessment have enough vision and motivation to learn print.

OTHER MEASURES

Non-optical measures are rarely understood or used as health/eye care staff might think these interventions are not 'medical'. The most common non-optical interventions that are very helpful for people with low vision of all ages relate to: Illumination: use of window light or of a reading lamp at work, reducing glare by wearing a cap. Contrast and Colour improvement. Distance: by reading at a closer distance. Size: by simply writing a bit larger. Posture: by using a reading or writing stand to avoid bending over and blocking the light. Optical low vision devices that are available in many locations include low power hand magnifiers and high+ spectacles (+2.0 to at least +10.0 D lenses in a frame). In addition any optical low vision devices can be ordered for a reasonable price from the low vision resource centre at the Hong Kong Society for the Blind. If available, referral to a large eye hospital, at tertiary level, with a low vision service should be considered.

Last but not least, all interventions need to be part of the advice given at the end of an assessment. It is important to realize that parents and teachers in general receive little/no information about low vision and the importance of use of vision. Simple explanations will improve compliance and motivation to (facilitate) use of (improved) vision. Implementing these relatively simple measures can improve the vision and thus the quality of life of many children with low vision.



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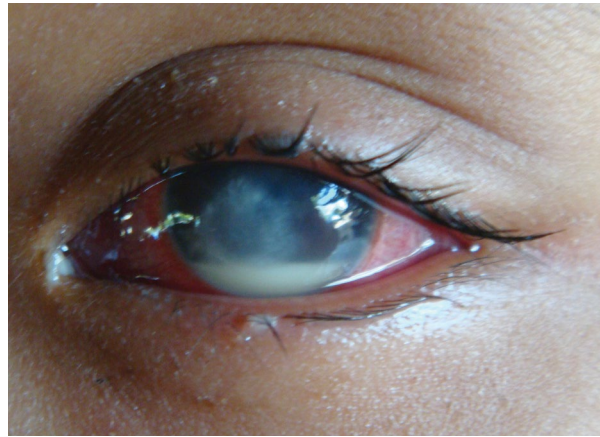


Fig. 1 Patient with advanced fungal corneal ulcer (after foreign body injury during work at a paddy field)

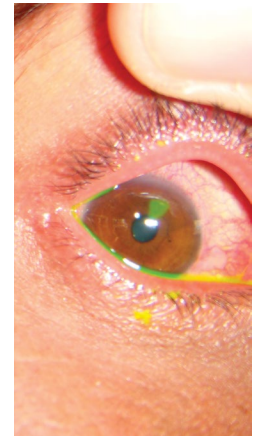


Fig. 2 Stained cornea of a patient with confirmed corneal abrasion

COMMUNITY-BASED PREVENTION OF CORNEAL BLINDNESS, A SUCCESSFUL PROGRAMME IN TAKEO PROVINCE, CAMBODIA

Corneal ulceration as a result of untreated traumatic corneal abrasion is one of the leading causes of ocular morbidity and blindness worldwide.⁽⁴⁾ In developing countries the main cause of corneal ulcer is a minor agricultural injury sustained during farming, e.g. during plantation and harvest. Patients usually prefer treatment nearby (such as by unlicensed pharmacies, traditional healers, private doctors, or apply eye-drops, already used by others). They therefore present late at the hospital with severe bacterial or fungal ulcers, that are resistant to treatment. The widespread availability of steroid-containing eye drops, contra-indicated in case of simple corneal abrasion, results in an even higher incidence of corneal ulcer.

A community-based strategy for early treatment of corneal abrasions and prevention of corneal ulceration was tested before in several studies.⁽²⁻⁵⁾ It showed that post-traumatic corneal ulceration can be prevented by simple topical application of 1% chloramphenicol eye ointment (e.o.) shortly after the injury, by trained village health workers (VHWs). Immediate treatment with antibiotic e.o. also prevents the development of fungal corneal ulcers, that are otherwise very hard to treat.

Corneal scarring unrelated to trachoma was identified as the second main cause of bilateral blindness in a Rapid Assessment of Avoidable Blindness (RAAB) in Cambodia in 2007.⁽⁶⁾ In a hospital-based study (2005) at the CARITAS Takeo Eye Hospital (CTEH) 130 patients had been admitted within a period of only 6 months because of a severe corneal ulcer: 50% was due to trauma, 75 out of 99 eyes were blind (VA <3/60) due to late presentation and 23% of the eyes had to be removed, due to very severe intra-ocular inflammation, resistant to treatment.⁽⁷⁾ The high number of patients with advanced corneal



ulcers at CTEH was the main reason to initiate a community-based prevention programme, based on the previous studies. The objective was to demonstrate the feasibility beyond a strict research setup and to integrate community-based prevention in a busy secondary eye hospital in rural Cambodia.

METHODOLOGY

In 2008, 26 volunteer village health workers (VHWs) from 2 communes were trained by staff of CTEH for one week in basic eye care, to identify corneal abrasion with fluorescein strips and a blue torch, and to treat abrasions with 1% chloramphenicol e.o. three times daily for three days. A population of 20,012 in 26 villages was prospectively monitored by the VHWs for 13 months. The villages were located near CTEH in a rural area, dominated by agriculture. VHWs were also taught to record visual acuity (VA) using an E-chart, identifying corneal ulcer and other common eye diseases, and how to refer to CTEH. They were advised to treat a) only residents of their intervention area, b) patients presenting within 48 hours of the injury with confirmed corneal abrasions and c) patients aged 5 years and older. Every month the VHWs were called to CTEH for reporting and follow-up.

RESULTS

During 13 months, 1,147 individuals (female 56.9%, male 43.1%) reported to the VHWs. 783 (78.2%) were farmers. VHWs diagnosed corneal abrasion in 1,004 cases (87.5%). The main results of these 1,004 cases are presented in table 1.

TABLE 1 Outcome in 1,004 patients with corneal abrasions, as diagnosed and treated by VHWs

Corneal abrasion	1,004	100%
Healed corneal abrasions	949	94.5%
Referred because of corneal ulcer despite treatment	34	3.3%
Dropped out	14	1.4%
Missing results	7	0.7%

In total 713 (71.3%) patients reported an injury of organic nature, of whom 392 (39.2%) had an injury with rice. Table 2 demonstrates the seasonal correlation between location and agent of ocular injuries. In December 2008 and 2009 (main harvest season in Cambodia), around 70% of all ocular traumas were reported to have happened during work in the paddy fields, with rice grains as major agent. A second peak with a similar pattern could be observed in April and May (minor harvest and early plantation season).

Visual acuity was less than 6/60 in 26.4% of all patients before treatment. After treatment, only 1.1% could see less than 6/60.

Of the 34 patients referred because of corneal ulcer, 9 (26.5%) were lost to follow-up. Of the remaining 25 patients, 7 (28%)

corneal ulcers could be confirmed at CTEH. None of these eyes had to be removed. In 18 patients (72%) corneal ulcer could not be confirmed. Additionally, 46 sight threatening (cataract, pterygium etc.) and 28 conjunctivitis cases were referred by the VHWs.

DISCUSSION

This intervention project aimed to prevent traumatic corneal ulcer in a region dominated by agriculture, with a hot and humid climate and known high prevalence of corneal blindness.^(6,7) Hospital-based data indicate that at CTEH the overall number of patients that had to be treated because of corneal ulcer decreased from 745 in 2007 to 442 in 2013, a decrease of 41% while yearly more patients attended! This study therefore shows that early application of chloramphenicol e.o. probably prevented a considerable number of corneal ulcers.

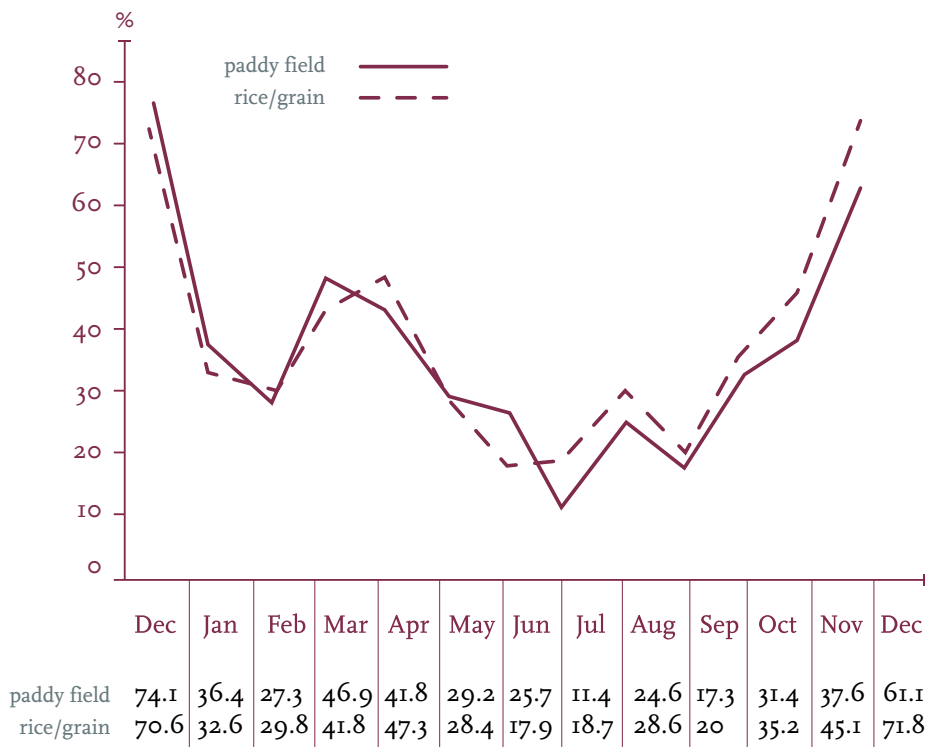
Only 28% of the patients referred with corneal ulcer could be confirmed. As the VHWs had been trained only for one week, such misdiagnoses had been expected. There was confusion with a variety of other causes of red eyes –not ulcers– but yet in need of treatment. We consider this therefore as a positive outcome.

VHWs had to be selected from the communes in collaboration with the local authorities. Therefore, this Cambodian experience may reflect the ground reality and may serve as a feasible model of intervention despite some limitations.

The strong correlation between the harvest season, location of ocular trauma and reported agent is important: massive awareness campaigns before the harvest season and basic training of primary health care workers for a short period may be able to prevent many corneal ulcers in communities with a large agricultural sector and hot and humid climates. As a result of our study, we have indeed initiated mass radio messages at the start of the harvest season in order to create awareness of the importance of early treatment after sustained corneal injury.

CONTINUATION BY LOCAL GOVERNMENT

Advocacy efforts by CTEH resulted in significant support by the local government institutions, especially the Provincial Health Department (PHD) of Takeo Province. The project continued during 2010 and 2011 with support from CTEH and was handed over to the PHD in February 2012. In these 3 years, all together 1,985 patients with corneal abrasions were identified (healing rate 98.9%). 24 Patients with suspected corneal ulcer and 246 patients with other eye diseases, like cataract, pterygium etc., were referred to CTEH. We hope that the Cambodian Ministry of Health, will adapt community prevention of corneal ulceration as a national strategy in the next multi-year plan.

TABLE 2 Reported location of ocular injury and agent from December 2008 until December 2009 by VHWs


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Immune Recovery Uveitis Involvement of the eye in Immune Reconstitution Inflammatory Syndrome

Since the advent of the so-called combined Anti Retroviral Therapy (cART) the Immune Reconstitution Inflammatory Syndrome (IRIS) has emerged as an important condition complicating antiretroviral treatment: 10-25% of patients receiving cART may develop atypical forms of (opportunistic) infections (OI), presenting with unusually enhanced inflammatory reactions. Because the clinical symptoms worsen while under therapy, these manifestations are referred to as paradoxical. The term "unmasking syndrome" (regarded by some as a distinct form of IRIS), is used in case symptoms of a previously subclinical OI become manifest. Such reactions are attributed to dysregulation of immunological responses to antigens from opportunistic pathogens in a partially restored immune system. IRIS typically occurs during the initial phase of cART (highest incidence 8-16 weeks after initiation⁽¹⁾), and is associated with a wide spectrum of pathogens, most commonly mycobacteria, herpes viruses, and fungal infections such as cryptococcal meningitis. Patients with advanced immune deficiency (CD4 cell counts fewer than 50/ μ L) have the highest risk of developing IRIS.

OCULAR IMMUNE RECONSTITUTION PHENOMENA

Soon after the introduction of cART, enhanced ocular inflammation (diagnosed by the presence of cells and flare in the eye) was observed in the anterior chamber and vitreous cavity of patients with inactive CMV-retinitis (CMV-R). This uncommon phenomenon typically occurred within 6-12 weeks after initiation in patients with advanced immune depletion^(2,3). Classically, the clinical picture of CMV-R in AIDS is characterized by only minor inflammation in these compartments as a result of the inability to mount inflammatory responses due to severe immune incompetence. Now, enhanced inflammation seemed to be associated with a rapid increase of CD4 cell counts to values above 100/ μ L, and was attributed to enhanced immunological responses against CMV antigens as a result of cART. Because this ocular form of IRIS presents as uveitis, it is usually referred to as 'immune recovery uveitis' (IRU).

Apart from CMV-R, other (opportunistic) infections, such as mycobacterial infections⁽⁴⁾ and infection with *Leishmania major*⁽⁵⁾ have also been associated with IRU.

CLINIC

The clinical spectrum of IRU expands from asymptomatic in some patients, to acute onset and self-limiting course (transient vitritis)⁽²⁾, and to chronic persisting uveitis with long term complications⁽³⁾.

For symptomatic cases of IRU, visual loss and floaters are the most common presenting symptoms. IRU-induced permanent loss of vision may result from complications of the intraocular inflammation, most commonly cystoid macular edema (CME) and epiretinal membrane formation, reflecting the primarily posterior segment location of inflammation in most cases^(3,6).

DIAGNOSIS AND TREATMENT

The diagnosis IRIS (IRU) is usually made on the basis of clinical evidence of newly developed or enhanced (intraocular) inflammation in HIV-positive

individuals with advanced immune deficiency, shortly after receiving cART.

While inflammation in IRIS generally can be mitigated by corticosteroids, infectious diseases require a different approach, namely control of the underlying infectious agent, in which corticosteroids are often contraindicated. Unmasking IRIS should be differentiated from co-infections (e.g. tuberculosis, syphilis) and other disseminated (O)Is, systemic diseases, and primary manifestations of (ocular) infection. One should always be alert to distinguish whether the symptoms result from a process of restoration of the immune system due to cART, or rather should be regarded as the expression of a (disseminated) infection in a still immune incompetent individual. Obviously, to justify the diagnosis IRIS, a certain degree of immune recovery should be achieved (rise in CD4 cell count by >50/ μ L to a level > 100/ μ L⁽⁷⁾). This reflects a degree of immune recovery expected to control CMV in the absence of anti-CMV therapy.

Unmasking forms of IRIS generally require treatment of the causative pathogen, with simultaneous mitigation of the destructive inflammatory reaction. IRU in case of active CMV-R requires anti-CMV medication until under cART a substantial and sustained rise in CD4 cells has been achieved. In cases of mild and more advanced IRU, topical or orbital floor corticosteroids are usually sufficient to control inflammation. This therapy may also be beneficial for CME, and improve vision, at least in the short run. Established CME associated with IRU however, can follow a chronic course that is refractory to therapy.

PREVENTION

It is probable that most cases of IRIS can be prevented by early identification of HIV-infected patients, and initiation of cART before they reach the advanced stage of immune deficiency associated with a high risk of OIs. Primary treatment of systemic OIs for a short period preceding initiation of cART may be indicated. Some investigators believe that a similar approach may reduce the incidence of CMV-associated IRU. However, because CMV retinitis is associated with

a very high risk of mortality especially in the absence of cART, even a short delay in the initiation of cART should be avoided⁽⁸⁾. Only very rare circumstances would justify discontinuation of cART in case of IRU⁽⁹⁾.

Further research into the incidence and outcome of IRU, especially in resource-poor regions, is needed to better clarify the extent of this evolving problem in the regions of highest HIV prevalence.



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SOME IMPORTANT DUTCH NON-GOVERNMENT ORGANIZATIONS IN THE FIELD OF EYE CARE

WWW.ASIANEYECARE.NL

Projects in Cambodia, Vietnam and Myanmar for the prevention and treatment of blindness, including training.

WWW.EYECAREFOUNDATION.NL

Projects in Nepal, Vietnam, Cambodia, Laos and Tanzania. In Tanzania supporting training of ophthalmologists for Tanzania and surrounding countries.

WWW.FIGHTFORSIGHT.NL

Lions Working Group against blindness in cooperation with Wild Geese for support to small scale projects in Africa and Asia, cataract surgery, instruments, equipments, infrastructure, school screening and low vision programmes. May provide direct support for urgent needs.

WWW.LIGHTFORTHEWORLD.NL

Projects in Africa and Asia for the prevention of blindness and visual impairment, for education and rehabilitation and for local capacity building.
(Previously known as Foundation Dark & Light)

HTTP://SLAH.NL

Stichting Leer Anderen Helpen. Projects in Indonesia among less privileged populations. Treatment and training.



Eye diseases in HIV/AIDS – some practical tools for diagnosis and treatment

Imagine, you are a general practitioner in a middle-sized city somewhere in sub-Saharan Africa. On Monday morning your first patient in the Out Patient Department is a 33-year-old male with, since two weeks, the symptoms of herpes zoster ophthalmicus on the left side. He cannot close his left eye anymore due to scar formation of the upper eyelid, his eye is painful, red and filled with puss, the vision in this eye is markedly reduced. The second patient is a 40-year-old woman with, since several months, a conjunctival growth on the right eye. The third patient is a 29-year-old male with, since several weeks, a strange, thickened dark red upper eyelid of the left eye. The eyelid is not painful. He has dark red patches in his oropharynx. The fourth patient, a 36-year-old woman, has been put on HAART recently as she was found to be HIV positive. She is complaining of loss of vision.

DIFFERENT TIMES

30 years ago it was very rare to start the week in the OPD like this. However, with the arrival of HIV opportunistic infections like herpes zoster ophthalmicus (patient 1) and neoplasms like squamous cell carcinoma of the conjunctiva (patient 2) and Kaposi sarcoma (patient 3), are nowadays common in relatively young patients. And since the introduction of Highly Active Antiretroviral Treatment (HAART) in 1996 new phenomena like Immune Recovery Uveitis (patient 4) have appeared (see article Meenken & van den Horn in this MT bulletin). Worldwide more than 35.3 million people have been infected with HIV, the greater part in sub-Saharan Africa (25 million), Asia (4.8 million) and North America/Western Europe (2.1 million). In lower-income countries it is the second cause of death after lower re-

spiratory infections. Adnexal and orbital complications affect more than 25% of untreated HIV-positive patients and could be the presenting sign of the disease. Keratoconjunctivitis sicca occurs in 10 to 20% of patients and in more advanced stages of the disease posterior segment manifestations like retinal microvasculopathy and cytomegalovirus (CMV) retinitis are seen in some areas in 40-50% of patients.

OPPORTUNISTIC INFECTIONS

Eye diseases diminish the quality of life of patients suffering from AIDS. For the general practitioner it is important to recognize that an infection can be opportunistic, due to AIDS. As many general practitioners are the first doctors patients visit they are the ones who diagnose the disease and who decide on therapy and referral. In this paper some tools are presented to recognize HIV related eye diseases and to facilitate treatment and/or referral.

Two important skills are necessary to fulfil this task: knowledge and examination skills. The general practitioner should have knowledge about which opportunistic infection fits into the picture of a certain level of immunodeficiency. And the general practitioner should be capable of performing a basic eye examination. HIV is acting by reducing the number of CD4 cells, eventually leading to deep immune incompetence, which paves the way for opportunistic infections and neoplasms.

In diagnosing an opportunistic infection a handy tool is the hand ophthalmoscope. Floaters can be recognized easily (see article Hardus and others in this journal). Therapy depends on the availability of drugs. In individuals with advanced immunodeficiency more aggressive therapy is mandatory as they have an increased risk of permanent vision loss.

HERPES ZOSTER

A patient with herpes zoster ophthalmicus could benefit from acyclovir (800 mg five times daily) or valaciclovir (1000 mg three times daily), topical calamine lotion or emollient, potassium permanganate soaks, systemic antibiotics in case of secondary infection and analgesics like indomethacin (50 mg three times daily), while amitriptyllin (75-150 mg at night) and carbamazepine (100 mg once or twice daily) can reduce post herpetic neuralgia. Local therapy for cornea exposure due to a retracted upper eyelid could consist of eye ointment and a tarsorrhaphy.

KAPOSI

In case of a Kaposi sarcoma of the eyelid and conjunctiva there are more Kaposi in the mouth. Median survival in sub-Saharan Africa is 3.5 months. Treatment is, in the first place, to start HAART as soon as possible as it greatly improves the chance of survival. Surgical excision is sometimes possible, but as Kaposi sarcoma is a heavily vascularized tumour this can be difficult. Radiotherapy and intralesional vinblastine chemotherapy are other options.

CONJUNCTIVAL GROWTH

The differential diagnosis of a conjunctival growth is (apart from a few other rare tumours like non-Hodgkin lymphoma, pyogenic granuloma after trauma and papilloma) pinguecula (harmless hyalin degeneration), pterygium (from the conjunctiva spreading "wing" over the cornea with parallel blood vessels giving rise to astigmatism and eventually covering of the pupil) and conjunctival intraepithelial neoplasia leading to squamous cell carcinoma of the conjunctiva. Squamous cell carcinoma of the conjunctiva must be excised completely with a free zone around the process of at least 2 mm as recurrences can be very aggressive. If possible the whole area is treated with double freeze-thaw

cryotherapy. An alternative is application of 5-fluoro-uracil 1% eye drops four times daily during four days followed by ten days rest and reinstallation of 5-fluoro-uracil 1% four times daily. In case of metastasis the first stations are the submandibular- and pre-auricular lymphnodes. If the CD₄ count is below 200 patients are more likely to suffer from intra-ocular infections. Those in-

fections reduce the visual acuity and can be diagnosed by funduscopy. Look for local and systemic signs of the infections of table 1. AIDS is still a deadly disease. In general, prompt diagnosis of HIV and timely start of treatment with HAART is essential to improve the condition of the patient.



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Fig. 1 Herpes zoster ophthalmicus



Fig. 2 Kaposi sarcoma of the eye lid

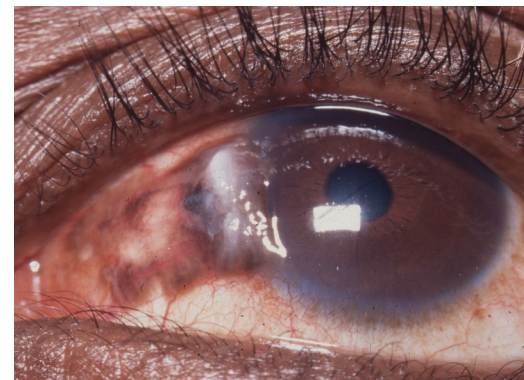


Fig. 3 Conjunctival intraepithelial neoplasia

TABLE 1 Overview ophthalmic manifestations of HIV infection by CD₄ T cell count

CD ₄ < 500	Herpes zoster ophthalmicus Kaposi sarcoma Lymphoma Squamous cell carcinoma conjunctiva
CD ₄ < 200	Tuberculosis Toxoplasmosis Fungal infections like Coccidioidomycosis, Cryptococcosis, Histoplasmosis, Pneumocystis jirovecii
CD ₄ < 100	Cytomegalovirus retinitis, Herpes zoster virus retinitis Mycobacterium avium complex infection Microsporidiosis Progressive multifocal leucoencephalopathy Retinal/conjunctival microvasculopathy



The red reflex and more, the direct hand-held ophthalmoscope

In circumstances where resources are scarce, one has to use simple methods. These methods are not automatically poor.

RED REFLEX EXAMINATION

An example of a simple, efficient method is the red reflex examination: if the light of the ophthalmoscope is aligned along the visual axis, the pupillary space will appear as a reddish colour, the so-called red reflex. This is a reflection of the fundus colour, back through the vitreous, lens and cornea (same as red pupils on a photo). The red reflex is observed by holding the ophthalmoscope 30-50 cm., dialling the "wheel" of the ophthalmoscope to get the proper reflex and to focus well: dial the wheel to +2-+3. Any opacity located in the optical pathway will block this bright reflex and appear as a dark spot, or shadow. This shadow can be fixed or mobile: to judge mobility ask the patient to look up and down and then straight again; if there is a moving shadow coming along it must be in a fluid or gel: theoretically also in the anterior chamber, in practice in the vitreous.

If the opacity is stationary it is located in the lens (cataract) or on the cornea (scar, foreign body).

SEE THE FLOATERS

With a shift these days to more posterior segment pathology, including uveitis posterior, this examination is becoming more important. If there is a very poor or absent red reflex this is usually due to a dense cataract, or, in rare cases, to a vitreous haemorrhage, retinal detachment or tumour.

When looking with +10 D when looking at 10 cm (= 1/10 m) the red reflex can

be judged better but there is the risk of pupillary constriction due to more light. In that case, it is best observed after mydriasis with a short acting anticholinergic drug as tropicamide (do not use atropine because the dilating effect of one drop can last up to 14 days). Adding a sympathomimetic drug (such as phenylephrine 2.5%) to stimulate the musculus dilatator can help to get a wider pupil. Realize that in darker people it will be harder to get dilatation.

If dilatation does not result in a wide round pupil there probably will be synechia posterior: the iris is attached to the lens, a common clinical feature in uveitis. A trauma of the anterior part of the eye can result in a uveitis with synechia posterior but also in synechia anterior due to a previous perforation: the iris is plugging the hole in the cornea. Most of the times a corneal scar is visible then.

Inspection with the slit aperture, most of the times present on the ophthalmoscope and a loupe (or spectacles S+3) can help to differentiate. Let the slit come from the side.

EXAMINE THE PUPILS

Before dilating you will examine the pupillary reflex with the light of the ophthalmoscope. (Pupils Equally Reacting to Light and Accommodation (PERLA)). As with judging the red reflex this is best done in a semi-dark room.

The ophthalmoscope is meant to see the fundus.⁽¹⁾ Dilatation is necessary because, due to the pupillary reflex, the pupil is contracting and it is hard to see the retina through a small hole. Looking at a fundus of a dark person can be more difficult than of a Caucasian due to the darker appearance of the retina. Realize that your refraction and that of the patient together have to be zero in order to get a sharp image.

Take the highest positive value because then the accommodation (of you or the patient) will be minimal. The value that shows a sharp picture of the retina also gives you an indication what the refraction error is.

An ophthalmoscope head is attached to a separate handle for the energy. Most handles, suitable for an ophthalmoscope head can hold an otoscope. So handy for the general practitioner.

DETERMINE REFRACTION

The direct ophthalmoscope can also be used as an 'auto refractor': let the patient look through the ophthalmoscope and let him dial the wheel until the E chart is best seen. The chosen number on the wheel is a rough indication of the refractive error, if any.

Two more ophthalmological devices can be added. A retinoscope uses the red reflex to determine the refractive error. This can be learned with a little patience.⁽²⁾ A special part is available for indirect ophthalmoscopy; together with a 20 dioptre lens one can judge the (peripheral) retina. The direct ophthalmoscope is excellent for judging the central retina. Recently there is also the possibility to use a special part so that even pictures can be made with an iPhone.⁽³⁾ It can also be used as a loupe with illumination, not only for eye purposes, and even as a torch for getting home. So it is an essential instrument for a general doctor in simple circumstances.



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Painful pigmented wound on the heel



Fig. 1 Lesion on the right foot

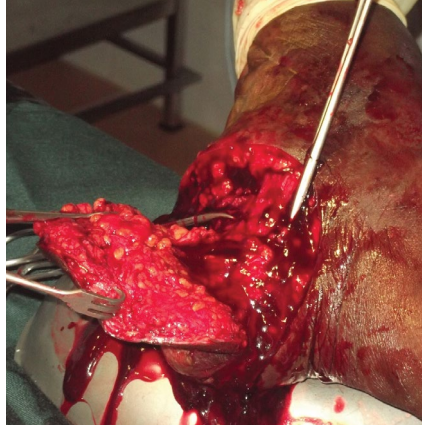


Fig. 2 During excision of the lesion



Fig. 3 The healing wound with clearly visible granulation

SETTING

The Lion Heart medical centre is located in Yele, a small town in the middle of Sierra Leone. This new rural hospital opened in 2012 and has a capacity of 32 beds divided in a male, female, pediatric and maternity ward. The medical staff consist of one medical officer, two clinical health officers and qualified local nurses. The hospital has a surgery room, basic laboratory facilities and digital radiography equipment. The nearest specialist hospitals are six hours away by car.

CASE REPORT

A sixty-five year old woman presented at the outpatient ward with complaints of a persisting wound on the heel of the right foot. The lesion occurred spontaneously one year ago; there had been no trauma. Recently the wound started to ulcerate and she developed a fever. No evacuation of pus was observed.

No relevant medical history or medication use was noted. The wound was painful and while walking the patient put her weight on the forefoot.

On examination she appeared healthy, there was no fever. On the plantar-medial side of the right heel there was a lesion with an irregular shape but with well-defined margins; it was depigmented, erosive and measured approximately ten by ten centimeters. In the centre a couple of irregular well-defined pigmented maculae were present with different stages of hyperpigmentation (Figure 1). There was no ulceration and no pus. Bilateral small inguinal lymph nodes were palpable. The hemoglobin was 8.5 g/dL and a malaria test was negative. An X-ray showed normal bone structures of the calcaneus and other parts of the ankle joint.

A malignant disease was suspected for which biopsy was needed for confirmation. Pathology services in Sierra Leone take a long time and are unreliable. Consult Online was asked for advice concerning the differential diagnosis and diagnostic and treatment options. With a suspicion of a malignant disease the local doctor proposed local excision or amputation.



ADVICE FROM THE SPECIALISTS

Three dermatologists replied within 5 hours. They all agreed with the local doctor; malignancy was probable but a biopsy would be needed to confirm the diagnosis. The most probable diagnosis was an acral lentiginous melanoma. The dermatologists proposed a wide local excision. If the excision area did not heal, amputation could be performed in a later stage. The excised tissue should be sent to the Netherlands for histological examination.

ACRAL LENTIGINOUS MELANOMA

Acral lentiginous melanoma is a subtype of the cutaneous melanoma occurring on the hands and feet. Although the acral lentiginous melanoma is rare in Caucasians, it is the most common subtype of melanoma in populations with darker skins. It is most often seen on the soles of the feet, but also occurs on the palms and subungual regions.¹⁻² About half of the hand and feet melanomas concern the acral lentiginous melanoma subtype.²

There are limited research data about early diagnosis and treatment of this specific subtype of melanoma. Acral naevi and trauma have been identified as possible risk factors, whereas UV-radiation seems to play little or no role at all. Prognosis of the acral lentiginous melanoma is poor in comparison to other melanomas, most probably because of the late diagnosis. It is also possible that this type of melanoma is more aggressive thus leading to a poor prognosis. The most important prognostic factors are the depth of the lesion according to the Breslow thickness scale and the presence of ulceration. This is comparable to the other cutaneous melanomas, although the prognostic factors seem to be less reliable to predict the outcome.²

TREATMENT

Wide local excision was performed after consent of the patient and

family. Macroscopically no signs of local growth were visible. After one week the wound of the excision area was granulating well and a skin graft was planned shortly. (Figure 2 and 3)

FOLLOW-UP

After 6 weeks the pathology report from the Netherlands showed an unclassified malignant melanoma with a Breslow thickness of 5 mm. The excision margins were not free of melanoma cells. With this Breslow thickness and the incomplete excision of the melanoma the prognosis was expected to be poor. The specialists hoped the excision would be sufficient but believed metastasis in the regional lymph nodes and/or hematogenous metastasis was likely. Because of the (local) therapeutic restraints the advice was to provide optimal palliative care when clinical suspicions for metastasis would arise.



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