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TRACHOMA AND THE SAFE STRATEGY

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Introduction

Five years have passed since the *Journal of Community Eye Health* devoted an Issue to trachoma, the leading cause of preventable blindness. That edition of the *Journal of Community Eye Health* (Vol. 7, Issue 14) noted that it was surprising that the most common cause of blindness after cataract was, in fact, attracting so little attention. Perhaps our recognition that trachoma can disappear with economic development, improved sanitation, and better personal hygiene led to complacence in Ministries of Health in many countries. The partial success of trachoma control through World Health Organization (WHO) programmes mounted in the 1960s, together with economic development in urban areas where trachoma had been a problem, led to neglect of this disease among the poorest segments of the world's population, especially in rural areas. It is these poor people, generally without basic sanitation, access to water, with little or no experience of economic development, who are most likely tobecomeinfected with *Chlamydiatrachomatis* and are at risk of blindness. Today trachoma is confined to 46 countries, mainly in Africa, the MiddleEast andAsia. Almost 150 million people are thought to have active infection and 5.6 million are blind or at immediate risk of blindness.Ten million people need simple eyelid surgery topreventconsequent blindness.

The SAFE Strategy: Surgery, Antibiotics, Facial Cleanliness and Environmental Changes

Photos: Murray McGavin & H Anenden/WHO

Trachoma Control: The SAFE Strategy

The good news, however, is that there is a rebirth of interest in control measures and an enthusiasm to launch programmes that include tertiary prevention (surgery), secondary prevention (antibiotic treatment of the infection) and primary prevention (facial hygiene and environmental change to improve sanitation) – the SAFE strategy. The acronym SAFE provides both an understandable approach and a rallying cry for those who are interested in eliminating this cause of blindness. **SAFE** combines the three elements of primary, secondary, and tertiary prevention but in the reverse order:

- **S**urgery to prevent blindness in those who have trichiasis/entropion.
- **A**ntibiotics (tetracycline ointment or azithromycin) tocombatactivechlamydial infection.
- **F**acialhygiene.
- **E**nvironmentalchange.

The importance of environmental change has never been stronger with the recent evidence by Paul Emerson and his colleagues that fly control can reduce trachoma prevalence.[1] Some have suggested that the final E should include not just environmental change but education and economic development. Perhaps SAFE with E3!

In This Issue . . .

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WHO Manuals and GET 2020

The World Health Organization has led the way in this rebirth, through the publication of the three technical manuals on trachoma control (Assessment, Surgery, and Achieving Community Support) and in the formation of the Global Alliance for the Elimination of Trachoma by the Year 2020 (GET 2020). This Alliance is open to all who are concerned with controlling this disease. It has grown from an original meeting of 12–13 interested parties to an attendance of more than 60 representatives of organizations concerned with trachoma control in Ouarzazate, Morocco at the third meeting in October 1998. Adding further support to the Alliance, in May 1998, the 51st World Health Assembly adopted a resolution calling for the elimination of trachomaas a causeofblindnessandrecommending that Ministries of Health pursue the SAFE strategy to do so.

Azithromycin

A new long-acting oral antibiotic, azithromycin, is as effective in a single dose as six weeks of daily tetracycline ointment. This has greatly improved the chances of reducing infection within a community and, when combined with the other elements of the SAFE strategy, could lead to elimination of the disease. Robin Bailey and his colleagues first reported the potential of azithromycin in The Gambia.[2] More recently, community trials using a common protocol in Egypt, Tanzania, and The Gambia have verified the effectiveness of this antibiotic in a rigorous comparison withtetracyclineointment.[3] Inthesestudies, compliance was assured. In actual public health campaigns, because of the difficulty in using the ointment and its unpopularity, one would expect that a single dose oral drug would be far superior. Encouraged by these results and the WHO recommendation that azithromycin should be tested in communitycontrolprogrammes, PfizerInc, the global pharmaceutical company, has begun its largest international philanthropy: a donation of $60 million worth of Zithromax®.

International Trachoma Initiative

In November 1998, Pfizer Inc, together with the Edna McConnell Clark FoundationestablishedtheInternationalTrachoma Initiative,anefforttotestthe SAFEstrategy using Zithromax in five countries. Whether this programme can be expanded will depend on the results in the first five countries.Thesecountries(Tanzania,Mali, Morocco, Ghana and Vietnam) were chosen from the WHO's 16 priority countries defined by the GET 2020 Alliance. The International Trachoma Initiative has received approval for a national programme in Tanzania and hopes that Mali and Morocco will be approved later in 1999. The International Trachoma Initiative, working with the Global Alliance, hopes to share information on operational research and programme evaluation and monitoring, based on its experience in implementing control in these five countries.

Thiseditionofthe *Journalof Community Eye Health* provides sound background information concerning trachoma control and recent developments in this area. The brief articles in this issue explain and amplify the steps needed to undertake the

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SAFE strategy. Additional detailed information can be found in the technical manuals available through the Prevention of Blindness Programme of the World Health Organization. In addition, the previous Issue of the *Journal of Community Eye Health* on this theme (No. 14) continues to be highly relevant, and back issues are available free of charge from the International Resource Centre (see page 54). One should also be aware of the trachoma teaching CD-ROM that has been produced by the Wellcome Trust and is distributed by CAB International. (See page 63 for details on how to obtain these and other teaching and educational materials).

The new antibiotic, azithromycin, is important as it may effect a decrease of transmission in a community, while the longer lasting elements of facial hygiene and environmental control are put in place. More important, however, is the rebirth of interest to assess and then take action to end trachoma as a cause of blindness. If the SAFE strategy can be put into practice where trachoma remains endemic, transmission could be halted well before 2020, the year that the Global Alliance expects to see an end to the need for corrective lid surgery.

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Trachoma Rapid Assessment: Rationale and Basic Principles

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Rationale

Today, trachoma is found in underprivileged communities with poor living conditions, where there is little hope of rapid economic development. The disease is found mainly in remote rural areas of most African countries, in some Eastern Mediterranean countries and in certain parts of Central and South America. Trachoma is also endemic in several Asian countries, but there is a lack of updated information from some highly populated countries, such as India and China.

The severity of trachoma and thus the degree of its blinding potential varies from community to community.

The **evolution of the disease typically presents two stages**, that are separated by several years, or often decades:

- **inflammatory (active) trachoma**, diagnosed most often in children. In many settings, girls tend to have more frequent and severe active disease than boys.
- **cicatricial (scarring) trachoma**, usually found in adults with ultimate development of trichiasis. This is often found 3–4 times more commonly in women as compared with men.

Consequently, when assessing trachoma at the community level, it is important to consider both the **inflammatory disease in children**, and the **potentially blinding complications (i.e., trichiasis) in adults**.

- In long standing hyperendemic areas there would be evidence of active severe trachoma in children, as well as trichiasis and trachoma related visual impairment in older persons. In such a situation both mass interventions (antibiotic distribution and health promotion) and trichiasis surgery should be provided.
- In certain circumstances, only mild, non-blinding trachoma cases are found in a community. If so, cases of inflammatory disease are seen in children and very few cases or no case at all of trichiasis are found. In such circumstances, there is usually no need for mass interventions at the community level and only recognised active cases need to be treated individually.
- By contrast, there are communities where trachoma may have been a severe disease in the past. Very few cases, if any, of inflammatory disease are identified in children. However, cases of trichiasis in adults are still present in the community. Trichiasis surgery needs to be provided without delay in these communities.

Financial and human resource constraints in many trachoma-endemic countries demand that elimination programmes focus on areas of blinding trachoma.

There is, therefore, **a need to identify** (with a fair degree of confidence) **those communities 'in greatest need' which should benefit from interventions** (treatment and prevention) **on a priority basis**.

Bilateral corneal scarring after trachoma
Photo: John DC Anderson

This assessment should determine the presence or absence of trachoma as a public health problem and the nature of the interventions to be carried out in a given community in order to eliminate the problem of blinding trachoma.

Risk factors for severe trachoma (i.e., leading to blindness) are well known (related to poor family hygiene) and easy to identify at the community/family levels. These include:

- Lack of facial cleanliness amongst children.
- Crowding: in circumstances where people live in close physical contact with each other, e.g., sharing the same sleeping material or bedding.
- Insufficient environmental sanitation, particularly for sewage and garbage disposal at the community level and the unavailability of latrines at the family level. These factors and others (such as keeping cattle next to human dwellings) make fly breeding possible close to households.

As trachoma is closely related to living standards and hygiene, its epidemiological pattern may change relatively rapidly, even if no specific intervention is carried out. This is true when socio-economic development occurs in the community. That is why the information needed to plan/re-plan a trachoma project/intervention should

reflect the actual epidemiological pattern existing in the communities concerned. The challenge for health planners and managers is to obtain a better insight into the current trachoma situation than that normally available from routine information systems. It follows that

When assessing trachoma it is important to assess not only the magnitude of the active disease, but also its degree of severity and the existing risk factors at community/household levels, at a specific point in time.

Epidemiological surveys offer a very useful way of collecting valuable information that is not available from routine health information or existing surveillance systems. However, 'classical' surveys are expensive (staff, time and money) and are very often difficult to carry out in a timely manner. Most of the endemic countries face economic barriers and lack of personnel. Consequently, most of the time, they cannot afford such surveys.

Rapid Assessment

In order to use scarce resources in a cost-effective and appropriate manner, and identify and reach the communities most in need of intervention, it is necessary to determine where most severe blinding trachoma is found. Thus, for programme purposes, a rational, rapid and low cost method of identifying specific areas/-communities liable to have a significant problem of blinding trachoma is needed**. Rapid Assessment (RA)**, in which health managers **review the existing records**, **interview key informants** and **make direct 'observations'** at the community level, when necessary, represents a suitable way of obtaining this information.

RA methodology is one of the operational research issues (along with surveillance, antibiotic distribution and community-based surgery) which have been agreed upon for further development by the WHO Alliance for the Global Elimination of Trachoma by the Year 2020 (GET 2020).

The term '**rapid'** refers both to the time spent in the field collecting the data and the time spent analysing these data. This should be **the minimum acceptable time to gather current information by which to develop a plan of action:**

- Managers and planners need to have a fairly **quick and cost-effective approach** for decision making purposes.
- RA is a method of **getting information** about a set of problems in relation to trachoma, in a short period of time and **without a large expenditure of professional time and finance.**

RA therefore represents the first step in the process of identifying communities for planning trachoma interventions (using the WHO Alliance-supported 'SAFE' strategy).

- RA is based on **community participation.**
- RA should be considered as **an operational tool**, developed to help decision makers to determine and target the most highly endemic communities for treatment.
- RA is a **practical way of determining rapidly** *whether or not* blinding trachoma is endemic in a given community.
- RA will allow for **ranking of communities** (for example into three groups of high, medium and low priority for intervention). In that sense, RA facilitates the planning of trachoma control activities through the identification of high-risk zones where large-scale interventions are indicated.

The basic principle is to collect the maximum of relevant information in the minimum of time and at the lowest cost in order to build **an information pyramid** (Fig. 1). The term 'information pyramid' refers to the description of the trachoma situation in a defined geographical area. This will be a three level pyramid.

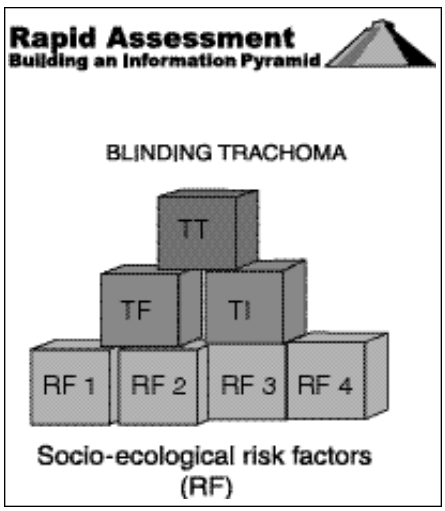

Fig. 1. Information Pyramid

The Information Pyramid

- The **top level** concerns obtaining data on blinding trachoma and the existence of cases of trichiasis in a community.
- The **middle level** describes the presence and severity of 'active' trachoma in the community.
- The **foundation** of the pyramid is built on information about risk factors and reflects the socio-ecological factors which may influence eye health and the severity of trachoma in that community.

Washing hands and face

H Anenden/WHO

When planners and eye project managers decide to carry out RA, they should collect separate sets ('blocks') of information, from different sources, in order to build up this pyramid. It is therefore crucial for them to find acceptable ways of gaining that information.

Information may be directly extracted from **existing written documents**. However, other ways must be explored systematically to gain information directly from people, through **interviews** or **group discussions** or the community through **direct observations made during field visits** or **eye examinations performed in specific age groups**.

Proposed Method for Collecting the Information

In order to identify the blocks of information needed to build up the pyramid, RA will systematically go through the following steps (Fig. 2):

1. Organise a first phase of investigation. This rather ***static/passive*** phase (mainly 'desk work') represents a preliminary assessment and consists of:

- Gathering and **reviewing all existing documentation** providing evidence of trachoma and its complications, as well as socio-economic information from the area of study.
- **Confirming and analysing** the information gained at the completion of this step
- Deciding **what additional information is still required**.

2. Organise a second phase of investigation, the ***dynamic/active*** phase (mainly fieldwork) and conduct visits in selected communities.

- **Trichiasis** will be assessed through a series of **simple questions**, followed by the identification by the community members of persons likely to suffer from 'in-turned' eyelids with lashes rubbing against the cornea. An **eye examination** should be carried out in every 'suspected' case, in order to confirm the diagnosis of trichiasis.
- **At least fifty children (1–9 years old)** should be examined from the households at higher risk to assess active infection in the community reservoir, using the **WHO simplified trachoma grading system.** The selection of households should be 'optimally biased' towards the least privileged ones, in order to increase the likelihood of diagnosing trachoma patients, if there are any in the community.
- **Facial cleanliness** should be recorded for each child examined.
- **Other hygiene-related risk factors** may be assessed at the household or community levels, such as availability of latrines, availability of water, etc.

3. The findings are summarised in a table, which shows the existence of blinding trachoma and active trachoma in the different districts/communities investigated, in order of priority.

Reminders

- **Involve the community.**
- **Do not collect too much data or data that you may not use!**

What Can be Expected from RA

Using RA data:

- The trachoma control co-ordinator will be able to provide more accurate figures on the **number of communities concerned** and on **population sizes** which will require active public health interventions.
- S/He is in a better position to **rank the districts/communities** and take immediate action within the framework of the SAFE strategy.
- Finally, the **distribution pattern of trachoma for each province/district/community** will become more evident and the need for additional (scientifically sound) epidemiological data will become obvious.

What RA is Not

- RA is **not a detailed household survey** which quantifies the size of the trachoma problem in the community. RA is **not based on an accurate epidemiological methodology**; it can only give a rough picture of the provinces/districts/communities where blinding trachoma exists. After a problem has been identified and given priorities by planners, a detailed survey may be necessary in certain circumstances, to provide sound baseline data.
- RA does **not and should never replace proper surveys** to assess the magnitude of the trachoma problem. It is not suitable for monitoring, nor does it provide a baseline for evaluation of interventions; more accurate methods are needed for that purpose.
- RA **indicates only what the trachoma-related problems are in a given community**, at a specific point in time.
- RA is, and should remain, **the beginning of a process** for collecting information in order **to prepare a plan of action** against trachoma.

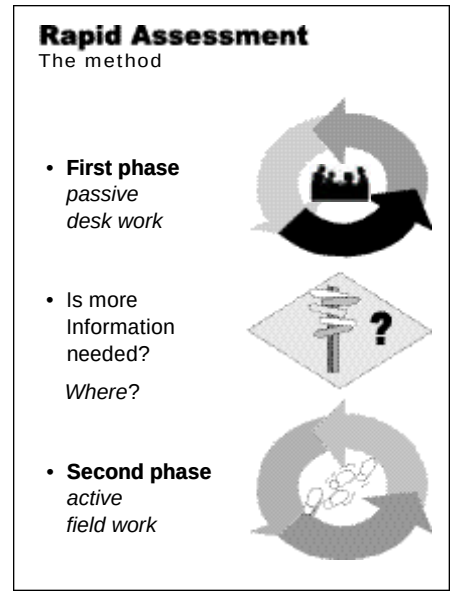

Fig. 2. The Method

Conclusions

The procedures of RA are not completely finalised. This paper shows the progress achieved so far. The procedures described above have not been fully endorsed by the WHO Alliance. Further field work and validation will need to be undertaken and reviewed. Extensive field work is presently being conducted using a 'draft manual' and technical support from WHO. It is expected that a more 'polished product' will be presented at the next Alliance meeting in December 1999.

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Trichiasis Surgery

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Introduction

Trichiasis involves eyelashes rubbing on the eyeball. Repeated infection with *Chlamydia trachomatis* causes scarring and shrinking of the conjunctiva lining the inside of the eyelid (tarsal conjunctiva), which has the effect of pulling the lid margin towards the eye (entropion) and with it the lashes. If the lashes are in prolonged contact with the cornea, then permanent corneal scarring and visual impairment may result. In addition, since the cornea is one of the most sensitive parts of the body, trichiasis can be a very painful condition.

Surgical Principles and Management

The principle of surgical management of this condition involves rotating the marginal part of the eyelid outwards, away from the globe, so that the lashes are no longer in contact with the eye. To achieve this, a horizontal lid split is made approximately 3mm from the lid margin (through tarsal conjunctiva and tarsal plate for the Trabut type operation or 'tarsal plate rotation' and, additionally, through orbicularis oculi muscle and skin for the bilamellar tarsal rotation). This is followed by outward rotation of the distal fragment which is effected by 'everting' mattress sutures. The bilamellar tarsal rotation is the procedure recom-

Trichiasis surgery
Photo: Mark Reacher

mended by the World Health Organization since a randomised controlled trial showed it to be the most effective.[1] The WHO manual gives clearly illustrated instructions on surgical and anaesthetic techniques and management of complications.[2] (See also Footnote).

The operation is quick and is widely performed by non-medical health workers under local anaesthetic as a day-case procedure. Patients can get back to work very quickly (a point which needs to be emphasised to them before surgery since worries about lost working time may be a significant barrier to acceptance). The risk of wound infection is relatively low because of the good blood supply of the eyelid and therefore surgery can be performed in patients' own villages. The equipment needed can be carried easily by a community nurse, alone, for example, on a motorbike.

Trichiasis Surgery and the SAFE Strategy

Surgery is the component of the SAFE strategy which has been shown to contribute significantly to prevention of blindness.[1] It also usually results in immediate and dramatic relief of discomfort for the patient. For these reasons, surgery is the first component of the SAFE strategy. It should be performed in the community, as a way into the community, and so gain support for the other elements of SAFE which may not be seen to have such an immediate and obvious benefit. In practice, however, acceptance of surgery by affected communities has been reported as low, even when surgery has been made available in the village.[3] Low surgical coverage was identified as diminishing cost-effectiveness of the surgical arm of a successful trachoma control programme in Burma.[4] The reasons for poor surgical uptake vary and are not well understood. One obvious factor is that the patient may not perceive the need. This is in contrast to cataract surgery which offers potential dramatic cure from blindness. Entropion surgery, to be effective (in terms of vision), needs to be performed before visual impairment and blindness occur. The World Health Organization GET 2020 Alliance has highlighted the need for further research into reasons for this poor acceptance and to investigate strategies for improving it.

Long Term Outcomes

The long term outcome of entropion surgery (and the importance of re-exposure to *C. trachomatis* in contributing to recurrent trichiasis) is presently unknown, since previous studies report follow up to a maximum of 3 years.[5] In practice, patients are often lost to follow up after only a week which makes monitoring of outcomes and of individual surgical performance difficult. Careful training and supervision are therefore essential, in the early stages of a control programme, not only regarding surgical technique but also in community sensitisation, anaesthetic technique (which if inadequate will affect efforts to improve community acceptance) and sterile technique. Sterile technique is particularly important in view of the rural, community environment and the HIV epidemic in Africa.

Community follow up of surgical cases should be routinely done on at least a selection of patients of all surgeons, to determine if any retraining is needed. This can be incorporated into community trachoma screening and monitoring programmes. Most programmes have to operate a cost recovery system for trichiasis surgery in which the patient bears at least part of the cost. This may act as a further barrier to acceptance by a patient who is unsure of the benefit. Further research is needed into the disability and economic consequences resulting from non-compliance, or poor accessibility to surgery for trichiasis. This will provide more effective arguments for funding this component of the SAFE strategy. In the meantime, existing resources must be channelled into delivering accessible surgical services, strong community cooperation, careful surgical training and community monitoring of post-operative cases. These steps will maximise both uptake and successful outcomes of trichiasis surgery.

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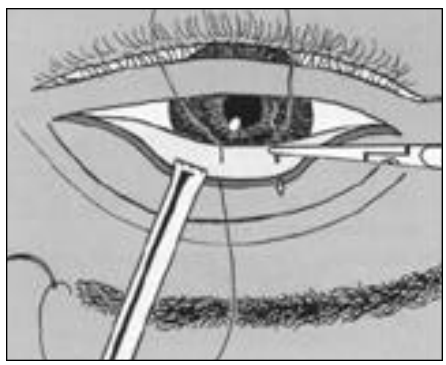
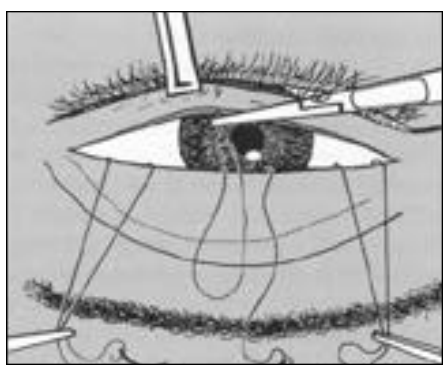


Trichiasis surgery: proximal fragment, first suture, first needle

Drawing: Hugh Lugg



Trichiasis surgery: distal fragment, first suture

Drawing: Hugh Lugg

Footnote: The bilamellar tarsal rotation procedure is described in more detail in the earlier publication on Trachoma. *Journal of Community Eye Health* 1994; 7: 21–26 (see box). Editor

Azithromycin for Control of Trachoma

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Introduction

The new Global Initiative by the World Health Organization has an ambitious goal of eliminating blinding trachoma by 2020, twenty years into the next millennium. GET 2020 consists of a four-pronged strategy to reduce active trachoma through community-based antibiotic distribution and health education on face washing and environmental sanitation, and to reduce vision loss from trichiasis through provision of appropriate surgical services. The SAFEstrategy–Surgery, Antibiotics,Facewashing, Environmental change – is currently being implemented or planned for five pilot countries where the antibiotic component will be based on the drug azithromycin under a donation programme by Pfizer, Inc.

Azithromycin represents a breakthrough for the community-based, antibiotic treatment of ocular *Chlamydia trachomatis* infection. Trachoma is a community disease, which clusters in neighbourhoods and within families, children having the highest rates of disease.[1] Treatment of a few cases in such a setting guarantees re-infection from familial or neighbourhood sources, unless the treatment is more widespread. Moreover, re-infection from extra-ocular sites can occur if only topical treatment is used,[2] and re-infection from other people can occur if treatment of members of the community is not carried out at the same time. Previously, topical agents, such as tetracycline, have been the agents of choice. This was done due to the absence of systemic side effects in children (seen with oral tetracycline) and the high cost andlackofavailabilityoforalerythromycin in many of these remote communities.

However, topical tetracycline must be used every day for four to six weeks to be effective. It also stings, is messy to use, and results in blurred vision because of its oily base. Compliance (regular use of the prescribed medicine) with topical agents is typically quite poor.

Azithromycin

Azithromycin, on the other hand, has been shown to be effective against *C. trachomatis* with one dose administered orally.[3,4] Azithromycin is in the azalide class of antibiotics. It has unique pharmacokinetic properties that make it ideal for treating trachoma; good oral bioavailability and distribution to tissues, sustained high tissue levels with low protein binding, and high intracellular concentration which is important in treating *Chlamydia trachomatis*.[5] Serum, aqueous and tear samples collected 4 days after azithromycin administration showed pharmacologically active concentrations, and conjunctival specimens continued to have high levels 14 days after administration.[6] The safety of a three dose regimen (once per week for three weeks), or single dose, has been demonstrated in clinical trials.[3,4,7] Side effects include occasional mild gastrointestinal upset, and cases of nausea, vomiting and diarrhoea, although, in large clinical trials, few side effectswererereported.

Azithromycin has been shown to be effectiveinclinicaltrialswhichrandomised those with active disease to either topical tetracycline or azithromycin. Under research conditions, compliance with both therapies was good, and the decline in disease was equivalent in both groups.

Azithromycin for Trachoma Control in Communities

These data led to support for a large, community based randomised trial in three countries, to determine the long term effect on trachoma at the community level of mass treatment with azithromycin, compared to tetracycline.[7] At one year post treatment, both clinical disease and laboratory evidence of infection in the community were reduced in both groups with evidence of a greater reduction in villages treated with azithromycin. Administration of the drug, and monitoring of compliance was considerably easier with azithromycin, compared to tetracycline topical ointment, The results of these studies have clearly identified that azithromycin offers an important new weapon in antibiotic intervention for trachoma control.

The enthusiasm for the use of this drug for trachoma control is very high, which has raised a new set of difficult questions. First, the drug is very expensive, prohibitively so for countries where trachoma control is important. At present, Pfizer has selected only five countries in which to test their donation programme, and other countries are not eligible to receive the drug without charge, except for research purposes. While other countries can proceed with topical antibiotics as part of their programme, the issues of compliance and likely coverage remain a problem. Second, the widespread use of oral azithromycin has raised concern for the potential development of resistant strains of *C. trachomatis*, as well as other sensitive organisms such as *S. pneumoniae*. While the development of resistance, based on a once-per-year treatment may be unlikely, this possibility needs to be addressed. Third, azithromycin has not been approved for use in pregnant women by the Food and Drug Administration in the United States (based not on concerns for safety, but on the absence of studies. Erythromycin, a similar antibiotic, is approved for use in pregnant women). Women are at increased risk of active infectionbecauseoftheircaretakingactivities with young children. If compliance is inadequate with topical preparations, women may form a significant source of re-infection of the community. Each country programme must currently weigh the risks and benefits of using azithromycin for treating active disease in pregnant women.

Operations Research

Operations research projects underway in Tanzania,Nepal,MoroccoandMaliareaddressing questions of the effect on communities of targeting treatment to individuals or families, as opposed to mass treatment. Infections which are not obvious on clinical examination have been reported as high as 30% in The Gambia and Egypt. If treatment is restricted to those with clinically apparent disease, the impact on trachoma over time in the community of not treating these cases is unknown. Alternative strategies for mobilising communities to ensure high coverage rates are also being tested.

Community health volunteer Kerege Joseph dispensing azithromycin suspension
Photo: Anthony Solomon

Suchresearchhashighpriority for showing programmes ways to use scarce resources effectively for the long term control of trachoma in their communities.

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Distribution of Azithromycin by Community Health Volunteers in Ghana

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In June and July of this year, an operational study to test the feasibility of usingcommunityhealthvolunteers (CHVs) to distribute azithromycin was undertaken in the Daboya subdistrict of Ghana's Northern Region. The objectives of the study were as follows:

- To test the ability and accuracy of community health volunteers (CHVs) in diagnosing active trachoma.
- To test the ability of CHVs to give the correct dose of azithromycin by weight to children and adults.
- To test the ability of CHVs to keep records of tablets received and distributed.
- To test the ability of CHVs to warn patients about possible adverse reactions, recognise them when they occur and take appropriate action if required.
- To test the feasibility of using azithromycin tablets in pre-school children.
- To document the response of each household to all occupants being offered azithromycin.
- To examine the relationship between height and weight in individuals requiring azithromycin for trachoma control.

Peer review formed part of the training programme

Photo: Anthony Solomon

The six volunteers, who have previously been involved in the Guinea Worm and Onchocerciasis Control Programmes as well as the distribution of ocular tetracycline for trachoma control, were given four days of revision on trachoma, and training in the use of azithromycin. Education sessions included theory, practical sessions teaching eye examination skills and the techniques for weighing and measuring, dose calculation and drug preparation. The CHVs then examined a total of 675 individuals in ninety households in local villages, looking for evidence of trachoma. They were accompanied by supervisors who independently examined all subjects, and intervened in treatment only when mistakes were about to be made. Azithromycin (a single dose of approximately 20mg/kg) was given to all individuals in any household in which there was at least one case of active trachoma.

The volunteers performed creditably. The decision to treat or not treat each household was correct on more than four out of every five occasions. The dosing reliability and drug management skills of CHVs were generally good. Community response was very positive, refusal of examination or treatment rare, and adverse reactions infrequent.

Practising eyelid eversion: Godwin Yidana examining Sadia Inusah

Photo: Anthony Solomon

Both 250mg tablets and suspension 200mg/5mL were available. Nearly all those 4 years of age and older were able to take tablets. Height and weight data was recorded for all individuals in treatable households, and the correlation between the two suggests that height could be used instead of weight for dose determination for those people able to take tablets. Given the practical difficulties involved with using weighing scales in remote settings, this finding could be of great potential benefit. Unfortunately, using height or length to predict dose for children requiring suspension was less reliable.

The major problems encountered in the study were weighing procedures, the use of azithromycin suspension, and volunteers' record keeping.

At the conclusion of the study, both volunteers and supervisors felt that a longer training period would have been of benefit. It is suggested that future education efforts would place more emphasis on the diagnosisofTFandTIattheexpenseoftimespent learning about TS and CO. Additionally, more teaching time should be devoted to drug side-effects and record keeping skills.

A paper is in preparation.

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Trachoma and Fly Control

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Everybody is aware of the annoyance and irritation caused by flies as they buzz around food and crawl over skin. In trachoma endemic areas, flies are frequently seen clustering around the face and eyes of children where they feed on mucus and discharge (Fig.1). This association of flies with the faces of infected children has not gone unnoticed, and they have been considered as vectors of trachoma for at least 400 years.[1]

Flies act as mechanical vectors of disease by picking up pathogens from infectious material and transferring them to an uninfected host. Flies have taste receptors on their front feet and when feeding they dip these into the food source as well as their proboscis. Thus, flies may be transferring *Chlamydia trachomatis* from the eyes of infected children to the eyes of uninfected people, on their feet and proboscis. However, the transmission of trachoma is poorly understood and there are other suggested routes which may be important in different places and at different times. Trying to prove that a particular route is operating, and establishing the relative importance of one route over another, is difficult. Until a recent intervention trial in The Gambia[2] there has been little strong evidence to prove that flies actually are important in the transmission of trachoma.

Fig.2. A Gambian field worker performing handnet collection of flies feeding on the ocular discharge of a child with active trachoma

Photo: Paul Emerson & Robin Bailey

In The Gambia, to determine whether flies were important in the transmission of trachoma, we removed them from the environment by ultra low volume spraying with an insecticide, deltamethrin. The study was conducted in two pairs of villages; one pair in the wet season, the other in the dry season. Spraying to control flies was carried out for three months in one village of each pair whilst the other acted as a control. The fly populations were monitored with traps and trachoma surveys were conducted across all age groups at baseline and at three months. Fly-eye contacts were monitored using handnets to collect flies landing on the faces of children to feed (Fig. 2). The prevalence of active trachoma was similar in the intervention and control villages at baseline, but after three months of fly control the prevalence of active trachoma was significantly lower in the intervention villages compared to the controls, in both seasons. Overall there was a reduction in the community prevalence of active trachoma associated with fly control of 61% (rate ratio 0.39 [95% confidence interval 0.20-0.77] p=0.007). Moreover, the number of new cases was significantly lower in the intervention villages than controls with an overall reduction of 75% in villages where fly control was practised (rate ratio 0.25 [0.09-0.64] p=0.003).

In the same way that all mosquitoes do not transmit malaria - all flies do not transmit trachoma. In The Gambia, we have found evidence to suggest that the most likely vector of trachoma is the bazaar fly, *Musca sorbens,* and that other flies are not involved.[3] The prevalence of trachoma falls when *M. sorbens* is removed from the environment. In addition, these flies are also present throughout the year in trachoma endemic communities, and frequently contact the eyes of children – particularly those with ocular discharge and *Chlamydia trachomatis* has been found on them.

Although our study suggested that insecticide spraying was effective in reducing trachoma transmission, it is unlikely to be feasible or sustainable in most trachoma-endemic areas.

Fig. 1. Everted upper eyelid of a Gambian child with follicular trachoma and a feeding female bazaar fly (Musca sorbens)

Photo: Paul Emerson & Robin Bailey

Musca sorbens breeds in solid faeces lying on the ground, but does not breed in latrines, where the contents liquefy rapidly. In Egypt, less trachoma was found in households in which simple pit latrines were present[4] and this may be because they reduce the *M. sorbens* population by restricting its breeding habitat. Measures such as the identification and removal of faecal contamination in the environment and the provision of latrines need to be evaluated. We are currently investigating whether the community wide provision of pit latrines can have an impact on trachoma control. Any measures that can reduce fly-eye contact are likely to be of public health benefit in the control of trachoma and, therefore, the importance of flies should be incorporated into health/hygiene promotion programmes and school curricula. Though eyelid surgery and antibiotic treatment make an immediate impact, the ultimate success of the SAFE strategy for trachoma control is likely to depend on finding sustainable ways of reducing trachoma transmission. The neglected area of fly control deserves some attention.

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Trachoma and Water

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Collection of water – at a distance – in Southern Africa

Photo: Erika Sutter

Trachoma Prevalence and Transmission

There are four reasons why one might expect improvements in water supply to reduce the transmission of trachoma in a community.

1. Children's faces are the sources and sites of re-infection with the organism, *Chlamydia trachomatis,* which causes the disease. Increased water availability means that faces can be cleaned more thoroughly and more frequently.
2. It also means that the objects which carry the organism between one person and another (such as fingers and bedclothes) can be kept cleaner and are less likely to be infected.
3. Trachoma is transmitted by flies (see the article in this Issue). If there is more water in a dry environment, including water spilt or thrown on the ground, this willprovidealternativesourcesof moisture to flies which would otherwise seek it on children's faces.
4. Finally, the water supply helps people to maintain a cleaner domestic environment (for instance, by washing dishes rather than leaving them around with food remainsonthem). Theenvironment will be less attractive to flies.

Trachoma and Water Supplies

Certainly, trachoma is generally found in the more dry parts of the world, such as the Sahel, India, and the Australian interior where water is scarce. However, the relationship between water supplies and trachoma is sometimes more complex than it might seem, and the proof that water supply improvement can help to reduce trachoma can sometimes be difficult. One study from Ethiopia[1] even found that people living further than 15 minutes' walk from a water source had *less* active trachoma than those with a source of water closer at hand.

Part of the explanation for such negative study results is that hygiene improvements do not follow automatically from the provision of a convenient water tap. If we study overall domestic water consumption as an indicator of hygiene and the time required to collect a bucket of water as an indicator of water availability, we find that the relationship between them takes a rather surprising form (Fig. 1).

The surprising part is where the water source is less than half an hour's round trip away from the household. In general terms, a half hour round-trip water collection journey corresponds to a distance each way of about 1 km (walking at 4 km/h, with no queue at the tap). When the existing source is farther away than this, then a tap closer to the home can be expected to lead to an increase in consumption. However, when this level of availability has already been reached, bringing the water source closer to the door has practically no influence on water consumption, unless the water is provided in the yard or in the house.

This graph relating domestic water consumption in litres per capita per day (l.c.d.) to the time required for water collection shows a plateau for times less than 30 minutes. The height of the plateau (i.e., average water usage by those in its range) depends on local circumstances. The plateau has been noted in studies in East, West and Southern Africa, Nicaragua and India.

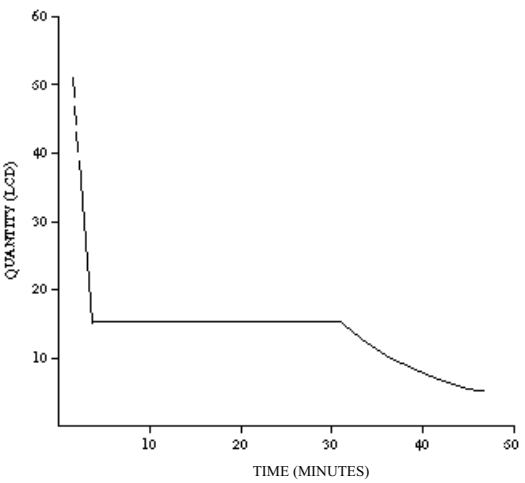

Fig 1: Domestic Water Consumption and Time Required for Water Collection

This 'water use plateau' has been documented by studies in East, West and Southern Africa, Asia and Central America. It means, that for people who are already on the plateau, a water supply providing an in-house level of service will increase their water consumption, affect their hygiene and by implication reduce their level of trachoma. If house connections of water are not feasible or affordable, priority in allocating water supplies should go to those who are farthest from their water source, and farthest off the 'edge' oftheplateau. That priority will help to ensure the maximum benefit in terms of eye health. Happily, it will also give the maximum benefit in terms of diarrhoeal disease reduction and also save in the weary task of carrying water. Water supplieswhichare good for health in general are also best for trachoma control.

Infact,bothwater and sanitation are good for trachoma control. A number of studies[1,2] have found less trachoma in families with latrines. Latrines help to control the *Musca sorbens* flies which land on children's faces, which may explain why they protect against trachoma.

The total amount of water people use gives only a crude indication of their hygiene. How the water is used determines whether it will help to control trachoma. For example, a study in The Gambia[3] found that the total quantity of water used by a household had no effect on the prevalence of active trachoma, but that trachoma-free households used more water for washing children than households with trachoma cases.

Trachoma and Health Education

This raises the possibility of using health education to encourage the use of water for specific hygiene purposes such as face-washing. Health education is probably cheaper than building water supplies; even so, there are no specific resources in most poor countries for health education simply to prevent trachoma. On the other hand,

adding too many messages to an existing health education programme weakens its impact, so that health educators may be unwilling to add a trachoma message to an already overburdened programme.

One promising possibility is that hand-washing, which is increasingly promoted to prevent diarrhoeal diseases, may also help to prevent transmission of trachoma and other eye infections. Fingers have been considered an important means of transmission of trachoma for sixty years,[4] and a field study from Indonesia[5] has shown that an intervention to promote hand-washing could be successful in reducing not only diarrhoea but also eye infections. As with the water supply itself, this is an example of how good primary health care can help to prevent trachoma best when it also prevents other diseases.

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Vision 2020: The Right to Sight

Report on the Sixth General Assembly of the International Agency for the Prevention of Blindness (IAPB)

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Sixth General Assembly

The 6th General Assembly of IAPB was held at the Friendship Hotel, Beijing, People's Republic of China, September 5–10, 1999. The meeting was co-sponsored by the World Health Organization, the Japanese National Society for the Prevention of Blindness and the American Academy of Ophthalmology.

There was a warm welcome from our Chinese hosts. Nearly 600 people attended, over 200 from China and 350 delegates from other countries.

This meeting is becoming an important event for all those concerned with eye care throughout the world. Although it occupied five days, the level of interest and high quality of debate was maintained throughout. There is now much more known about the epidemiology of the main blinding diseases and the different methods of control than five years ago at the 5th General Assembly in Berlin. The discussion was therefore more specific and at a high level. There was universal agreement that it was a most valuable meeting.

Officers of IAPB

The President of IAPB for the past 5 years (Dr R Pararajasegaram) and the Secretary (DrGullapaulliRao) aretobecongratulated on the excellent organisation of the meeting.

The new President for 1999-2003 is Dr Hannah Faal and the President-Elect is Dr Allen Foster.

Theme

The theme of the congress was the Global Initiative for the Elimination of Avoidable Blindness, entitled 'Vision 2020'. This Initiative was planned jointly by WHO and the Task Force of IAPB and launched in February 1999 in Geneva. It is set against the current background of over 45 million people blind, a number which is expected to double by 2020 if present trends continue. The purpose of the Initiative is to set common agendas and priorities which will feed into regional and national policy, planning and implementation. The first 5 year phase of the Initiative encompasses:

- specific disease control (large-scale cataract surgery; trachoma; onchocerciasis; childhood blindness; and provision of refraction and low-vision services).
- human resource development.
- strengthening of infrastructure and technology for eye care.

The conference was therefore primarily concerned with how these broad strategies can be translated into focused programmes at the local level, with collaboration between all the partners concerned.

Environmental improvements are vital for the control of trachoma

Photo: Paul Courtright

Some Highlights

Selected emphases which emerged from the presentations and discussions included:

1. Cataract Surgery

Three recent publications from India have highlighted the disappointing visual results from large scale cataract surgery. These were referred to several times. How these outcomes could be improved – by better training, better facilities, and better quality control – emerged as critical issues. The routine monitoring of quality of outcomes needs to be built into the data collection.

2. Trachoma

There is a major initiative, within the overall Vision 2020 framework, to eliminate trachoma as a blinding disease. The main issues are training of enough surgeons to deal with trichiasis; how the new antibiotic azithromycin should be used in mass distribution; and how environmental improvements can be incorporated into the programmes.

Control of blindness from onchocerciasis should be possible by the year 2010

Photos: Ian Murdoch, Allen Foster

3. Onchocerciasis

If the current mass treatment programmes with ivermectin can be sustained, control of blindness from this cause by 2010 should certainly be achievable.

4. Childhood Blindness

It is necessary to continue the elimination any new cases of measles and rubella, and to eradicate vitamin A deficiency. The next priorities are the surgical treatment of childhood cataract and corneal opacity, and screening and management of retinopathy of prematurity. The provision of low vision services was also highlighted.

5. Glaucoma and Diabetic Retinopathy

Whereas trachoma, onchocerciasis and vitamin A deficiency are focal and yield to public health measures, glaucoma, diabetic retinopathy and corneal scarring require ophthalmologists. Although these conditions are not in the global priority list for the first 5 year phase, they are already priorities for those regions of the world where ocular infections and the backlog of cataract have largely been controlled. We need model strategies for case finding and management for each of these conditions, thinking in terms of population units of one million people.

Glaucoma is now thought to be the second cause of global blindness. Speakers emphasised that we do have a good treatment for open angle glaucoma, particularly with the addition of antifibrotic agents to trabeculectomy. Although there are not yet tests for open angle glaucoma which are sufficiently sensitive and specific to detect the early pre-clinical stages, we should be able to identify the established cases which need immediate treatment.

6. Human Resources

We need increased numbers and improved quality of training for all cadres of eye workers. This is an area where national Ophthalmic Societies in industrialised countries may be able to make a contribution. A particular area of need is training in the management of paediatric problems.

7. Infrastructure and Technology

Emphasis was placed on financial sustainability, which has been achieved by some model programmes through cost containment, including the local production of IOLs, sutures, and surgical instruments; income generation using a multi-layered fee structure; and high quality of service delivery.

Conclusion

Although there had been questions before the meeting as to the value of the IAPB General Assemblies, in view of the time and cost involved, it was agreed by everyone present that this had been a most useful meeting and that the next General Assembly should go ahead in 4 years (in addition to 6 regional IAPB meetings in the interval). As well as enjoying many personal contacts, the delegates returned home stimulated by evidence of all that has been accomplished in the past 5 years, and inspired for their work in developing programmes for the prevention of blindness.

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Leprosy and the Eye Slides/Text Teaching Series

Author : Dr Margreet Hogeweg

First Edition 1999

A NEW slides/text teaching set from the International Centre for Eye Health – includes 24 colour slides (46 photographs/illustrations) and a handbook/text of 40 pages.

In 1997 the World Health Organization estimated that there were 1,500,000 leprosy patients with active disease. Around 2 million persons have been 'released from treatment' but remain with severe disabilities, including blindness. Up to 100,000 persons could be blind as a consequence of leprosy. However, if associated age-related cataract is also considered the total of blind persons with leprosy will be at least twice that number.

This slides/handbook set provides a practical tool for teaching health workers how to recognise and refer leprosy patients with eye disease. It also sets out the measures necessary for the treatment of eye disease in leprosy.

Lagophthalmos (left), sclero-uveitis (top right) & cataract (bottom right) – in leprosy

Photos: Margreet Hogeweg

Teaching Slide Set

The author, Dr Margreet Hogeweg, receiving the first copy of Leprosy & the Eye from the Editor

Photo: Sue Stevens

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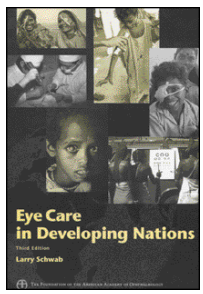
Eye Care in Developing Nations

Author: Dr Larry Schwab
Third Edition 1999



Published by:Foundation of the American Academy of Ophthalmology,USA
ISBN:1 – 56055 – 043 – 0

This third edition of Eye Care in Developing Nations has been eagerly awaited and updates the earlier edition's excellent coverage of eye disease and its management in the less-resourced parts of the world. Written for eye health professionals seeking to serve in developing countries, it is equally suitable for national health care workers, whose first language may not be English, because of its clear and concise delivery.

Dr Schwab responds to the need for affordable, acheivable and appropriate approaches to address the challenge of VISION 2020 —the elimination of avoidable blindness. All the major blinding eye diseases are covered together with relevant guidelines to support clinical practice.

Forthereaderwhoworksinareaslacking easy access to information and materials, the appendices on resource organizations and selected reading will be especially welcomed.

The book has 270 pages and is copiously illustrated with excellent black and white photographs. Thought-provoking, applicable and memorable quotes are added as a preface to each chapter and can only add to this excellent learning resource. The need for compassionate delivery of care to the poorest peoples in the world is addressed in a natural way and makes this publication exceptional for its target readership.

Sue Stevens

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Are We Reaching and Serving the Blind Poor?

Dear Sir

After a career in international banking, I began the study of medicine at age 40 and later established a small family-funded Eye Foundation. I have practised basic surgical ophthalmology in Latin America on a day-to-day basis for the past eleven years. In addition, I have been able to observe and follow the successes and failures of the fifteen projects our Foundation assists in Latin America , Haiti, Africa and Asia.

I am deeply concerned and disturbed by the widespread administrative and organisational failings which lead to unnecessary obstacles being placed in the paths of the blind poor. It appears that we are making enormous technical progress while ignoring the administrative and management skills required to reach the poor more effectively. The following are examples of some of these shortcomings.

1. Failure to 'triage' (priority of need and treatment) arriving patients, thereby focusing our limited resources on the more serious, treatable cases.
2. Turning away the blind due to often trivial and petty bureaucratic policies, e.g., registration cards are not available after 8:00a.m.
3. Insistence on useless laboratory and medical examinations for procedures carried out under local anaesthesia.
4. Cancellation of surgeries, often due to insignificantly raised blood pressure, coughing, anxiety and nervousness, lack of co-operation, etc. Almost all of these cases can be completed uneventfully and safely with the use of minor medications along with a small amount of patience and support.
5. Tying up a surgeon's time and energy with endless, routine clinical examinations.
6. Failing to allocate operating room time, bearing in mind that cataract surgery (and trichiasis procedures in trachoma endemic areas) have greater value and effectiveness in the developing world than all other eye procedures combined.
7. The direct material costs of good quality cataract surgery with IOL are now approximately $15. Ineffective charity programmes routinely charge the poor up to seven or eight times this amount.
8. Keeping uncomplicated post-operative patients more than one to two days, thereby reducing the beds available for new patients.
9. An insistence on large, comfortable US-style hospital beds and accommodation,therebyreducingavailableward space. The blind patient is more than happytospendoneor twonightsunder almost any conditions. His or her real concern and fear is to be sent away untreated due to a lack of available beds.
10. An insistence on unnecessary follow-up. Our own approach in an uncomplicated case is to send the patient who is far from home away with an eye shield and have him return if there is a problem, or if he or she desires to do so. If there is a noticeable loss of vision later, we recommend a return visit for a possible YAG or needle capsulotomy.
11. A frequent lack of empathy and courtesy towards the poor. We don't really have to make an effort to be accommodating if the patient has no other treatment possibilities.

It is worth noting that virtually none of these factors or attitudes are found in such highly effective, superbly organised hospitalsasAravind (India), CBM-Lahan(Nepal) and SEVA-Lumbini (Nepal).

The blind poor make tremendous sacrifices to reach surgical treatment centres. A significant factor in the success of the above three hospitals is found in the confidence and knowledge of the poor that once these sacrifices are made they will not be turned away untreated.

Thank you for the opportunity to express these impressions and concerns.

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Clinical Factors Influencing the Visual Prognosis of the Fellow Eyes of Normal Tension Glaucoma Patients with Unilateral Field Loss

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Roger A Hitchings

Aim

To investigate the influence of several clinical variables on the development of visual field loss in the 'second eye' of patients with normal tension glaucoma (NTG) presenting with unilateral field loss.

Methods

Patients with NTG and unilateral field loss at presentation were selected from a cohort of 403 consecutive diagnoses of NTG. The state of the visual field, 'normal' or with a visual field defect, was defined using the Advanced Glaucoma Intervention Study (AGIS) template. Whereavailable, opticdisc planimetry was carried out on stereo photographstakenatpresentation.Measurements of the topography of each of these optic discs were compared with morphometric values from a group of normal subjects, allowing for differences in age and disc size. For each patient the percentage of the relative neuroretinal rim (NRR) area was calculated. The time taken to develop a visual field defect was related to clinical factors including age, sex, peak and mean diurnal intraocular pressure (IOP), refraction, relative NRR area, and the AGIS score of the fellow eye at presentation.

Results

54 patients were included in the study. The median (range) follow up time was 49.2 (11.1–116.7) months. 14 (26%) patients developed field loss in the eyes with an initially normal field. The estimate of the median time to field loss onset was 95.1 months. Field damage developed more rapidly in women and in patients with greater AGIS score in the contralateral eye at the beginning of follow up ((adjusted hazard ratio, HR (95% confidence interval, CI) 0.20 (0.04; 0.93); 1.19 (1.02; 1.41) respectively)). Little evidence of any association was found between time to onset of field loss and each of age, refraction, and peak or mean diurnal IOP. Planimetric disc analysis was carried out in 33 (61%) patients. Of these 10 (30%) developed field loss in the eyes with initial normal field at a median follow up of 95.1 months. After adjustment for sex and AGIS, relative NRR area was found to be significantly related to the time of onset of field damage, the greater the reduction in relative NRR area, the shorter the time to visual field loss ((HR 0.93 (0.89; 0.99)).

Conclusions

NTG patients with unilateral field loss are at high risk of developing field damage in the eyes with an initially normal visual field. In this study, the visual prognosis of the eye with the normal visual field at presentation was found to be influenced by the extent of the reduction in relative NRR area together with the severity of field damage in the contralateral eye at presentation.

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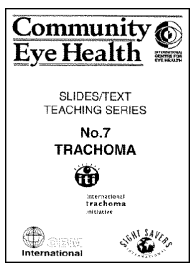
Trachoma Educational Resources



- **Slides and Handbook Set**

TRACHOMA

Updated in 1999 to include SAFE strategy

English only

Details available from:
INTERNATIONAL RESOURCE CENTRE
I.C.E.H., 11–43 BATH STREET,
LONDON EC1V 9EL, UK

- **Handout for Primary Care Level**

FOLHETO INFORMATIVO TRACOMA

Portuguese only

- **Manual for Secondary Level**

MANUAL DE VIGILANCIA EPIDEMIOLOGICA-TRACOMA-NORMAS E INSTRUCOES

Portuguese only

Details available from:
SERVICIO DE OFTALMOLOGIA SANITARIA
AVENIDA DR.ARNALDO,
351–6 ANDATR, SAO PAULO–SP,
CEP 01046 – 00, BRAZIL

- **Interactive Tutorial of 4 Hours Duration in CD ROM format** – for Medical Students, Teachers, Researchers and all Healthcare Professionals

TRACHOMA

English only

Details available from:
CAB INTERNATIONAL
WALLINGFORD, OXON
OX10 8DE, UK

- **E-mail Newsletter** – for all those concerned with the elimination of trachoma

TRACHOMA MATTERS

English only

Available via e-mail only.
To subscribe please send an e-mail to subscribe@trachoma.org

- **Earlier Journal on Trachoma**

J COMM EYE HEALTH

1994; 7: 17–32

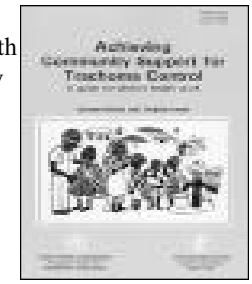
English only

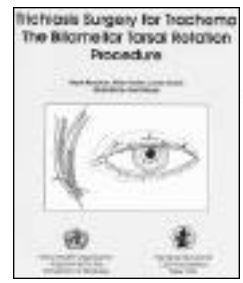
(See page 54 for details)

- **Illustrated Manual** – for district health workers focusing on the SAFE strategy

ACHIEVING COMMUNITY SUPPORT FOR TRACHOMA CONTROL

English only





- **Illustrated Manual** – for use in the training of eye surgeons, physicians, surgical nurses and other health workers to perform corrective surgery

TRICHIASIS SURGERY FOR TRACHOMA

English only

- **Manual with Colour Slides** – for use in training health workers to perform a simplified epidemiological assessment

PRIMARY HEALTH CARE LEVEL MANAGEMENT OF TRACHOMA

English only

TRACHOMA GRADING CARD

- **Illustrated, double sided card** – explains a simplified grading system for recognising Trachoma

English only

- **Vidoetapes** – highlighting control strategies for Trachoma

1. TRACHOMA: A MODERN APPROACH TO AN ANCIENT PROBLEM

2. DAMAGE CONTROL: TRICHIASIS SURGERY FOR THE PREVENTION OF BLINDNESS

English, French and Swahili

Details available from:
WORLD HEALTH ORGANIZATION
DISTRIBUTION AND SALES,
AVENUE APPIA, 1211 GENEVA 27, SWITZERLAND

Trachoma Slides/Text Teaching Series

An updated slides/text teaching set from the International Centre for Eye Health – includes 24 colour slides (53 photographs/illustrations) and a handbook/text of 42 pages.

Second Edition 1999

TRACHOMA

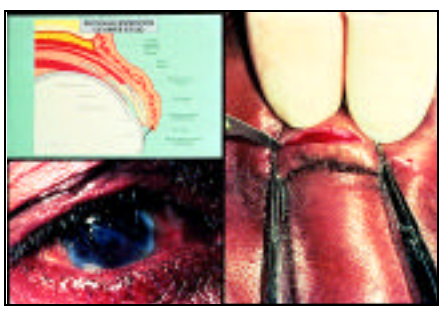
This teaching slide set uses photographs and other illustrations with an accompanying text to discuss:

- **risk factors** for the transmission of *Chlamydia trachomatis.*
- **clinical features** of the eye disease, using the simplified WHO classification.
- **medical and surgical treatments**.
- **preventive measures** including recommendations for personal and community hygiene and sanitation.

Trachoma has been updated and this new edition emphasises the **SAFE strategy** for the control of trachoma.

- **S:** surgical correction of trichiasis.
- **A:** antibiotic treatment of trachoma.
- **F:** facial cleanliness to prevent the spread of disease.
- **E:** environmental changes to improve personal and community hygiene.

The SAFE Strategy



Surgery

Graphic: Hugh Lugg
Photos: Mark Reacher and John DC Anderson

Antibiotics

Text: Pak Sang Lee

Facial Cleanliness

Photos: Erika Sutter, Victoria Francis and Hans Limburg

Environmental Changes

Photos: Erika Sutter and John Hubley

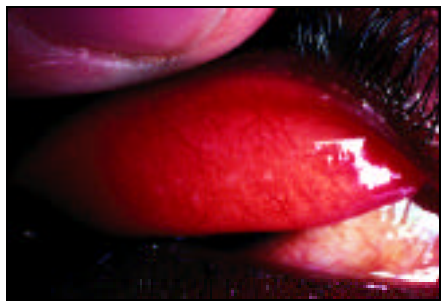
Ordering Information:

DevelopingCountryRate:UK £15/US$27 + £3/$5(surface) or£5/$9(airmail)postage.
Elsewhere:UK£20/US$36 + £3/$5 (surface)or£5/$9(airmail)postage.

Paymentbybanker'sordersand chequesdrawnonUK£orUS$bankaccountscanbeaccepted.
PleasemakechequespayabletoUNIVERSITYCOLLEGELONDON andsendwithyourorderto:

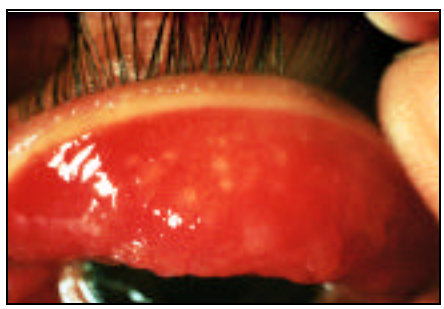
InternationalResourceCentre, ICEH,11–43BathSt.,LondonEC1V9EL.
Fax+44 20 7 2503207; E-mail:eyeresource@ucl.ac

Clinical Grading System



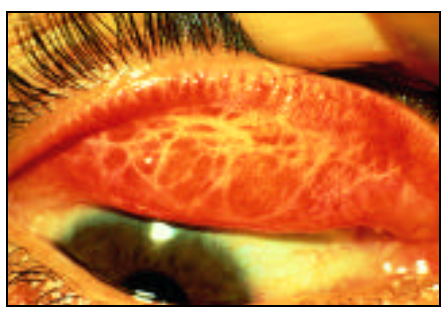
TF = Trachomatous Inflammation – Follicular

Photo: John DC Anderson



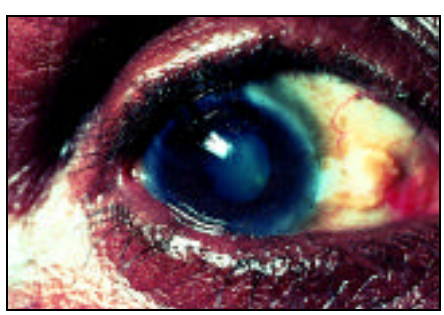
TI = Trachomatous Inflammation – Intense

Photo: Allen Foster



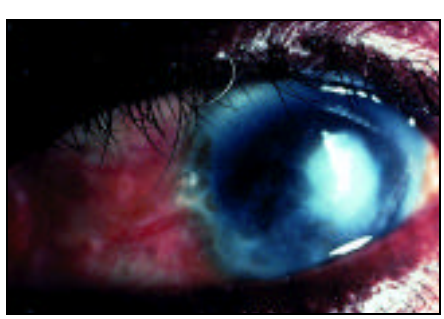
TS = Trachomatous Scarring

Photo: Hugh Taylor



TT = Trachomatous Trichiasis

Photo: John DC Anderson



CO = Corneal Opacity

Photo: John DC Anderson