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ONCHOCERCIASIS: IMPACT OF INTERVENTIONS

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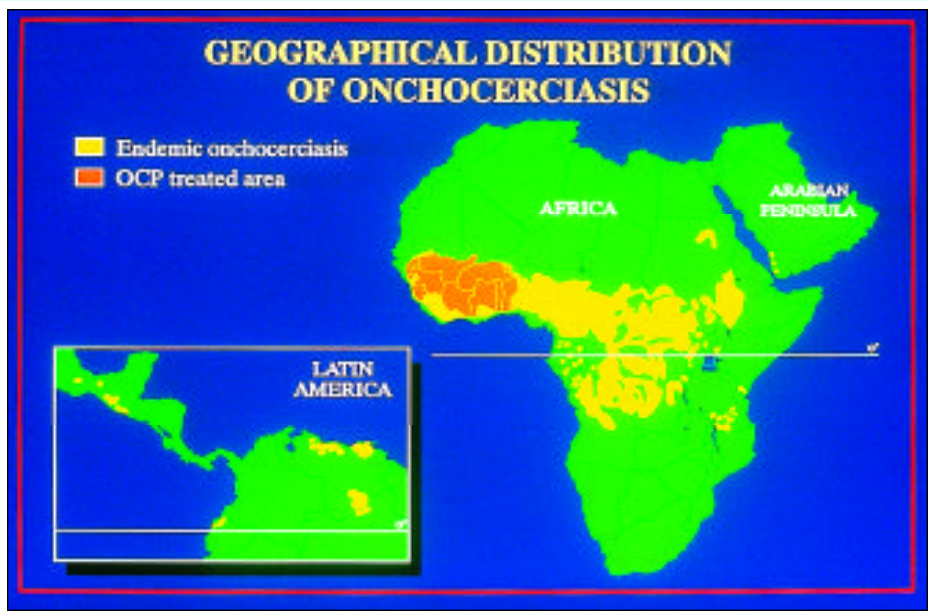

Geographical distribution of onchocerciasis

Graphics: International Centre for Eye Health

The Disease

Onchocerciasis, more commonly known as 'river blindness', is a parasitic, blinding disease, endemic in 30 African and six Latin American countries. Recent estimates point to around 18 million people infested with the parasite, the nematode *Onchocerca volvulus*, and some 270,000 who are blind from ocular complications.[1]

Control Efforts

Since before 1972, onchocerciasis had been subject to attempted control of transmission, beginning in the late 1940s in Africa. A unique success was the elimination of transmission of *Onchocerca volvulus* in one valley in Kenya, through the use of DDT. This result was lasting because of the ecological situation within a very isolated focus. However, similar attempts of vector control in other foci in West Africa had all failed because of re-invading flies from nearby endemic areas. At a meeting in Tunis in 1968, the idea of a large vector control zone in the Volta River Basin Area, which could encompass all known transmission and breeding sites and rule out re-invasion, was introduced. This was the philosophy behind the creation of the Onchocerciasis Control Programme (OCP) in West Africa, which was planned by WHO from 1972 to 1974, with joint input from the United Nations Development Programme (UNDP), the Food and Agricultural Organization (FAO) and the World Bank. OCP started its aerial operations for vector control in seven West African countries in early 1975, eventually covering an area of 1,235,000 km^2 and 50,000 km of river stretches. It was then expanded to 11 countries, and has undergone significant changes in terms of strategies and operations for control of onchocerciasis. It soon became clear that the problem of re-invading flies could occur, even in the new, vast programme area. After a few years, resistance by *Simulium* to the first insecticide used (temephos, or Abate®) became evident in certain foci. Despite these difficulties, OCP managed to continue its operations, with rotational use of other insecticides. When ivermectin (Mectizan®) was made available by Merck & Co., a new strategy was added; the distribution of ivermectin to affected populations in certain foci. It had been demonstrated that ivermectin, taken in annual doses, had a pronounced suppressive effect on onchocercal disease,[2] also reducing the microfilarial skin load down to very low levels for many months. A number of studies have been carried out on delivery systems and cost recovery for ivermectin delivery to those in need.[3] It became possible

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tocontrolboth thedisease andcontributeto transmission interruption in affected areas.

Twenty-Five Years of Progress

OCP has celebrated its 25th anniversary. It is a hugely successful programme, which has protected approximately 11 million children against onchocerciasis – and around 500,000 people have been saved from blindness. In addition, there has been tremendous socio-economic gain in the resettlements of new communities in the previously infested areas – some 250,000 km^2 of 'new' land has been resettled and is now being cultivated. New agricultural and other development schemes in these onchocerciasis-freed areas have contributed to an Economic Return Rate of around 18%, which is significant. OCP is now preparing for its closing down by the end of 2002, although surveillance activities for possible recrudescence of disease will continue.[4] Much work has also been done to transfer the necessary capability to Ministries of Health in member countries.

In parallel with the OCP developments, making use of ivermectin, new control programmes were also planned. In Latin America, where onchocerciasis is endemic in six countries (but with less blinding potential) a new project was created – the Onchocerciasis Elimination Programme in the Americas (OEPA). In that setting, with different and less 'effective' vector flies, the regular dosing of populations by means of ivermectin is likely to lead to complete interruption of transmission. The total elimination of the disease is possible, and good progress is being made in this direction. In Africa, a new African Programme for Onchocerciasis Control (APOC) was established in 1995, creating a partnership with a group of dedicated non-governmental organizations, in addition to the agencies already involved in OCP. APOC covers onchocerciasis in the remaining 19 endemic countries in Africa, in addition to the 11 OCP countries. APOC has made rapid progress in implementing Community Directed Treatment with Ivermectin (CDTI), through national task forces in all participating countries. The CDTI strategy promotes cost-effective and large-scale

ivermectin distribution to populations in need in endemic areas. Thus, the present estimated annual treatments are in the order of 15 million cases in the OCP and APOC areas.

It can be safely stated today that the elimination of onchocerciasis as a public health problem is now within reach. The ongoing and planned operations in the three control programmes (OCP, OEPA and APOC) will cover all disease foci, where intervention is necessary. Thus, by the year 2010, it will be possible to conclude that visual loss due to this dreadful disease will disappear. This would be one of the major achievements within the Global Initiative for Elimination of Avoidable Blindness, launched in 1999 by WHO in collaboration with a dedicated group of non-governmental development organizations, under the theme of 'Vision 2020: The Right to Sight'. The Initiative, which focuses on five major causes of avoidable blindness, is an outstanding effort for global action and partnership in the prevention of blindness. The possibility of eliminating onchocerciasis as a public health and socio-economic obstacle to development, is perhaps the first victory in sight for the 'Vision 2020' Global Initiative.

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Review Article

Vision 2020: Update on Onchocerciasis

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Onchocerciasis, also known as 'river blindness', is an insect-borne disease, caused by a nematode worm, *Onchorcerca volvulus*. It is the world's second leading infectious cause of blindness. In most of these countries it constitutes a public health problem and a serious obstacle to socio-economic development.

Disease Prevalence and Burden

- About 125 million people world-wide are estimated at risk of onchocerciasis, and, of these, 96% are in Africa.
- Of the 37 countries where the disease is endemic, 30 are in sub-Saharan Africa, six are in the Americas and one is in the Arabian Peninsula.
- A total of 18 million people are infected with the disease, of whom 99% live in Africa and at least one million are either blind or severely visually disabled. To these are added each year an estimated 40,000 new blind.

As the name 'river blindness' suggests, onchocerciasis is essentially a focal disease. However, where it exists, its impact on affected communities may be quite extensive and devastating. Thus, in many hyperendemic areas with blinding onchocerciasis, almost every person will be infected, and half of the population will be blinded by the disease before they die. Once blind, affected individuals have a life expectancy of only one third that of the sighted and most die within 10 years.

Recent studies in Ethiopia, Nigeria and Sudan have also shown that onchocerciasis is responsible for poor school performance and a higher drop out rate among infected children (due to itching, lack of sleep, etc.), while low productivity, low income and higher health-related costs are found among infected adults.

Disease Transmission

The parasite. *Onchocerca volvulus*, the causal agent of onchocerciasis is one of a large group of nematodes. The adult worms live encysted in fibrous nodules. Each nodule contains between 2-3 female worms lying in a twisted, tangled mass, hence the term *volvulus*. Adult female worms have a life span of 8 to 10 years but may live up to 15 years, during which time each releases millions of first-stage larvae, also known as microfilariae. In hyperendemic areas, the total microfilaria load in the body of affected individuals may be as high as 150 million.

The vector. Onchocerciasis is transmitted from one individual to another by a black fly of the genus *Simulium*. The blackfly larvae require well-oxygenated water to mature, and eggs are laid in rapids in fast flowing rivers and streams. Female black flies require a blood meal to produce/lay eggs, and it is during this meal that they may transmit or receive the onchocercal infection.

Cycle of infection. Microfilariae enter a female blackfly when she bites an infected person. A small percentage of these reach the insect's thoracic muscles where after several moults, they become third-stage infective larvae. They then migrate to the insect's salivary glands and are ready to be transferred during the next blood meal.

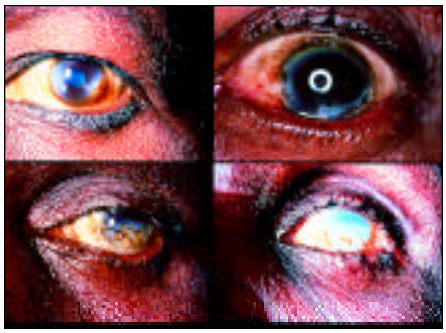
After entering the skin of the human host through the bite of an infected blackfly, the infective larvae (usually two to six) migrate through the subcutaneous tissues. Here, over the next 12 months, each larva will mature into an adult male or female worm. Before a heavy load of adult worms and pathogenic microfilariae builds up in the human host, this sequence has to be repeated many times over, and many years of exposure are usually required.

Clinical Manifestations

The people most at risk from onchocerciasis are those who for reasons of occupation (e.g., fishermen, farmers, sand diggers) have spent long hours or live nearer to the breeding sites. Early manifestations of the disease in infected persons usually appear one to three years after the injection of infective larvae. Nearly all the lesions of onchocerciasis including those in the eye, are directly or indirectly related to local death of microfilariae. Generally, live microfilariae stimulate very little inflammatory response and the mechanisms that protect them from the host's immune response are still largely unknown.

Box 1: Non-Ocular Manifestations

- **Pruritus:** often severe and unrelenting
- **Nodules:** subcutaneous, painless, typically found around bony prominences (iliac crest, greater trochanters, ribs, knees, coccyx and skull)
- **Severe, disfiguring skin disease:** may lead to thedistress ofsocial stigma, psychological and sleep disorders
- **Lymphatic:** lymphadenopathy, hanging groin
- **Unproven but suspected associations:** hyposexual dwarfism, higher prevalence of epilepsy



Sclerosing keratitis in onchocerciasis
Photos: Ian Murdoch & Allen Foster

The clinical features of onchocerciasis may be divided into two main groups: *ocular* and *non-ocular*, as summarised in Boxes 1 and 2.

Control of Onchocerciasis

The past ten years have seen a rapid and remarkable expansion of onchocerciasis control activities worldwide, thanks to joint efforts and support from WHO and other UN agencies, the World Bank and a growing coalition of **N**on-**G**overnmental and **D**evelopment **O**rganizations (NGDOs). These efforts are coordinated by three major regional programmes, one in Central and Latin America, the ***O**nchocerciasis **C**ontrol **P**rogramme of the **A**mericas* (OEPA); and two in Africa, the ***O**ncho-cerciasis **C**ontrol **P**rogramme* (OCP), and the ***A**frican **P**rogramme for **O**ncho-cerciasis **C**ontrol* (APOC). Together these three regional programmes cover more than 99% of all endemic populations and all but one (Yemen) endemic countries. (Please see the Editorial by Dr Bjorn Thylefors).

Strategy Options for the Control of Onchocerciasis

The control of onchocerciasis today is based essentially on two strategies: *Similium* vector control and large-scale chemotherapy with ivermectin. Each may be used alone or in combination.

Vector control. This is the chief strategy used in West Africa by the Onchocerciasis Control Programme (OCP) since 1974. The main goal in vector control is to interrupt transmission of *O. volvulus* by regular aerial spraying of all *Simulium* larval breeding sites, and to maintain this for at least 14 years until the infection has died out in human populations. This strategy, used alone at the beginning and now in combination with ivermectin, has been highly effective: onchocerciasis has been virtually eliminated in the original seven OCP countries, and progress elsewhere in the programme area is so advanced as to justify the closing down of OCP in 2002. For reasons of cost and operational feasibility, vector control could not be applied or extended to other endemic countries outside the OCP area of operation.

Chemotherapy. Ivermectin is the only chemotherapeutic agent recommended for use against onchocerciasis. Its mass distribution constitutes the main strategy for the other two regional programmes, APOC and OEPA. It is a semisynthetic, macrocyclic, lactone antibiotic widely used in the field of veterinary medicine against a wide range of animal parasites. It was developed during the 1980s. In 1987, the manufacturers, Merck & Co., made the generous decision to donate ivermectin free for the treatment of human onchocerciasis, 'to as many as needed and for as long as required'. Its main characteristics can be summarised as follows:

Box 2: Ocular Manifestations

Anterior segment
- Live microfilariae in anterior chamber (AC)
- Punctate keratitis, leading on to sclerosing keratitis
- Early uveitis, leading on to chronic uveitis

Posterior segment
- Choroido-retinitis, leading on to choroido-retinal atrophy or optic nerve atrophy
- Acute optic neuritis, leading on to optic atrophy

Others
- Night blindness
- Visual field loss and constriction
- Irreversible blindness

- It is a microfilaricide, with a very wide therapeutic range (150–800 micrograms/kg)
- It is highly attractive and popular in endemic communities for its many other beneficial effects on intestinal worms, scabies, head lice, and for its supposed enhancing effect on libido
- Given at the recommended single dose of 150µ/kg, it is effective for up to a year.
- When given to the largest sections of affected communities, it may significantly reduce disease transmission
- However, because ivermectin has no demonstrable direct effect on the adult worm, it must be given repeatedly for up to 12–15 years, i.e., the time it takes for most adult worms to die.

Current Uses of Ivermectin in Onchocerciasis Control

There are two main uses of ivermectin in the treatment of onchocerciasis: passive or clinic based, and active, as in large scale or mass treatment of entire communities.

Passive or clinic-based treatment. This is the form of treatment available to all those seeking medical treatment and in whom a clinical diagnosis of onchocerciasis has been made in a hospital or health centre. It is directed primarily to infected individuals and is the main method of treatment in hypoendemic areas where the risk of blindness or severe skin disease is virtually non-existent.

Community mass treatment. Also known as *community-wide treatment*, this is the method of choice in meso- and hyperendemic areas of onchocerciasis, i.e., where onchocerciasis is considered a public health problem. In these areas ivermectin is given once a year for at least 14 years, as recommended in Table 1, to all members of the community except for the exclusions defined in Box 3.

Over the years mass treatment has evolved from mobile strategies used in the early days following ivermectin donation to various forms of community-based treatment. In nearly all cases, these changes have been dictated by the need to reduce operation costs, increase treatment coverage and maximise programme impact on affected communities. The latest and most widely used of these community-based strategies is known as **C**ommunity **D**irected **T**reatment with **I**vermectin (CDTI). With this method considerable efforts are made to involve affected communities themselves in the planning, implementation and monitoring of treatment activities. CDTI is the preferred and official method used throughout Africa by both OCP and APOC.

Box 3: Exclusion Criteria for Ivermectin Treatement

- **Children under 5 years (age), or Less than 15 kg (weight), or Less than 90 cm (height)**
- **Pregnant women**
- **Lactating mothers of infants less than one week old**
- **Severely ill persons**
- **Use with extreme caution in areas co-endemic with Loa loa**

Table 2 is a summary of current uses of ivermectin in onchocerciasis control, based on endemicity levels.

Ivermectin treatment greatly reduces transmission of the parasite, but does not halt it. As and the adult worm may live for as long as 14-15 years, annual large-scale treatment will therefore have to continue for a very long time. Recent predictions with a simulation model have indicated that at coverage levels of around 65%, annual treatment may have to continue for up to two decades. The main challenge

Table 1: Recommended Doses of Ivermectin in Mass Treatment

Weight (kg)	Height (cm)	No. of Tablets (3 mg)
15–25	90–119	1
26–44	120–140	2
45–64	141–158	3
65 or more	159 or more	4

facing ivermectin-based control, therefore, is to develop and implement simple methods of ivermectin delivery which can be sustained by the communities themselves. Hence the attractiveness of CDTI.

The risk of resistance to ivermectin is remote within the time frame of the proposed Programme. However, the history of parasite disease control based on chemotherapy suggests that a cautious approach should be adopted. Recent model simulations and molecular biological studies indicate that resistance could become a problem over a twenty- to thirty-year time period, despite the long generation time of *O. volvulus*. It is important, therefore, to continue the development of alternative drugs for the treatment of onchocerciasis.

Table 2: Treatment Approaches Based on Endemicity Levels

Hyper-endemic (40+% nodule carriers)	Mass treatment (CDTI)
Meso-endemic (20-39% nodule carriers)	
Hypo-endemic (<20% nodule carriers)	Clinic-based treatment
Non endemic	No treatment

Macrofilaricide: Moxidectin

The development of a macrofilaricide drug is currently being undertaken through the *MACROFIL* project, a WHO based project which aims to develop a macrofilaricide, i.e., one which kills the adult worms.

Of the many candidate drug compounds that been tested and identified so far, moxidectin, has shown to be the most promising.

Final results of moxidectin trials in animal models were reviewed by WHO in March 2000. These pre-clinical studies have shown it to fulfil many of the criteria for a potential macrofilaricide: easy to use, safe and effective.

At present moxidectin is only available in veterinary formulations, but plans are under way to start clinical trials in humans.

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The Case of Ivermectin: Lessons and Implications for Improving Access to Care and Treatment in Developing Countries

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On October 21, 1987, Merck & Co., Inc., announced plans to donate Mectizan (ivermectin), a new medicine designed to combat onchocerciasis ('river blindness'), for as long as it might be needed. Merck took this action, working in collaboration with international experts in parasitology, the World Health Organization, and other agencies to reach those affected by the illness. This unusual decision came twelve years after the discovery of ivermectin by Merck scientists and nearly seven years after human clinical trials in Dakar, Senegal. Merck chairman, Raymond V Gilmartin,hassincereaffirmed the company's commitment to donate 'as much Mectizan as necessary, for as long as necessary, to treat river blindness and to help bring the disease under control as a public health problem'.

Through the continuing collaboration of an international, multi-sectoral coalition including the WHO, the World Bank, UNICEF, the Mectizan Expert Committee, dozens of Ministries of Health, the international donor community, more than thirty non-governmental development organizations, and local community health workers, there is hope that onchocerciasis can be eliminated as a major public health problem and socioeconomic development constraint within the next decade.

The Merck Mectizan Donation Program (MDP) is now the largest ongoing donation program of its kind. There are active treatment programs in 33 of 35 countries in sub-Saharan Africa, Latin America, and Yemen in the Middle East, where onchocerciasis is endemic. To date, more than half a billion Mectizan tablets have been donated and shipped since the inception of the Program. An estimated 25 million individuals are treated annually, with the 200 millionth treatment scheduled to take place this year.

Challenges and Obstacles

At the start of the Mectizan experience, there were significant challenges to expanding access to this safe and effective treatment for onchocerciasis. Although treatment requires only one annual dose, easily administered, governments were not convinced initially of the feasibility of providing treatment, due to the lack of resources needed to distribute the medicine to patients in need. There were competing health priorities and relatively poorly developed community health infrastructures in many of the countries hardest hit by onchocerciasis. Treatment programs faced both distribution and logistical challenges (including the technical issues of drug importation regulations and customs duties). Finally, since onchocerciasis strikes populations in remote areas in some of the poorest countries in the world, the political and civil unrest in some of these countries made it even more difficult to place free Mectizan in the hands of people infected with, or at risk of contracting, river blindness.

Lessons Learned

What lessons have we learned from the Mectizan experience? What has it taught us about how to mobilize resources in successful public/private partnerships to address significant health problems – and to do so in a way that significantly reduces disease burden over the long term?

In one sense, Mectizan is unique — effective treatment requires only one annual dose, easily administered, with no major side effects. But it nonetheless provides an instructive case study in the interrelations of scientific and clinical research, corporate social responsibility, and the challenges of health and development. Some of the critical success factors from this experience include:

- the need to focus scientific and clinical research resources on feasible targets for clearly important health priorities
- the importance of partnerships among public and private sector organizations (including non-governmental development organizations) to control a dreadful disease, informed by the needs of the people whose lives are directly affected
- the essential role of distribution mechanisms and healthcare infrastructure in ensuring that medicines reach those who need them.

This is a shortened version of a paper presented by ***Dr Jeffrey L Sturchio*** *to a* ***World Health Organization/World Trade Organization Workshop on Affordable Drugs*** *(Høsbjør, Norway, April, 2001) The full text of the paper can be found on the workshop website*:
http://www.wto.org/english/tratop_e/trips_e/tn_hosbjor_e.htm

Partnerships

The value of partnerships in advancing the cause of global health cannot be overstated. The complexity of the issues we face, the entrenched nature of the diseases we fight, and the fragility of the healthcare infrastructures we seek to build are all beyond the capability of any single organization or country alone. It is critical that the public and private sectors work together in a way that enables the people who are most directly affected to determine their own needs and priorities. Partnerships work best when based on clear objectives, trust, complementary expertise, and mutual benefits. And the continuing need for coordination, communication, and commitment from all involved in the process is crucial to success.

Infrastructure

Merck's responsibility in meeting global health needs goes beyond discovering and developing a medicine like ivermectin, and beyond merely making charitable contributions. In over a decade of experience, we have learned that simply removing cost as a barrier (by providing medicine free of charge) is not enough in itself to ensure that the medicine gets to the people who need it most.

Sustainability

Mectizan also shows that for a donation program to succeed in a significant way, commitments to ensure sustainability are as critical as promises to supply the product. The MDP is one example of how drug donation programs can be sustainable. Merck made a commitment to provide Mectizan for river blindness wherever necessary, for as long as necessary. For organizations that supply

Mectizan via community health programs, the Mectizan Expert Committee requires a minimum five-year commitment before agreeing to supply the medicine. The strategy of CDTI (community-directed treatment with ivermectin) has been employed to ensure sustainability by having Mectizan delivered to patients by village health workers as part of regular healthcare delivery – in fact, a remarkable 34,440 communities in affected regions are now planning and managing Mectizan distribution.

The MDP case also suggests that donation programs should, where possible, be integrated into a country's healthcare system. Onchocerciasis control efforts have been supported by local healthcare workers trained in the distribution, administration and monitoring of Mectizan treatment. These skills have enabled healthcare personnel to apply their knowledge to other initiatives that support a country's healthcare objectives. The involvement of the political and health structures of affected countries, together with the communities directly affected by the disease, have proven essential to routine distribution activities, long-term sustainability and overall success in diminishing the burden of disease.

Health Impact, Capacity Building, and Implications for Future Access Programs

The case of Mectizan clearly demonstrates the power and possibilities in strong, transparent, and creative public/private partnerships to help address the enormous public health challenges facing developing countries today. Since the inception of the MDP, some 16 million children have been spared the risk of infection in 11 countries in West Africa due to a spraying program combined with Mectizan treatment. The World Bank reports that 25 million hectares of arable land have been recovered – enough to feed 17 million people. More than 600,000 cases of blindness have been prevented.

The cooperative nature of the program has helped to strengthen the primary healthcare system in many countries where Mectizan is delivered: the delivery infrastructure and treatment strategy have resulted in the delivery of other health services (e.g., vitamin A) and diagnoses of other conditions (e.g., cataracts). In effect, the initial decision to donate Mectizan served as a catalyst for a much broader — and effective — health intervention.

There is real hope that this sad scene of a child leading a blind person will soon be a picture of the past

Photo: CBM International

The Merck Mectizan Donation Program – which has helped millions of people in the developing world – is an instructive case, reminding us that even when medicines are free, questions of infrastructure, transparency, distribution, logistics, partnership, and sustainability structure the prospects for long-term health benefits. These lessons are significant in considering approaches to other medical conditions and programs of care and treatment in the developing world. While simple solutions won't work, the Mectizan case, by showing what can be achieved, is a cause for optimism.

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Abstract

A Prospective Study of 413 Cases of Lens-induced Glaucoma in Nepal

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Albrecht Henning MD
Jitendra Kumar MS
Allen Foster FRCOphth

Purpose: To determine the frequency and types of lens-induced glaucoma (LIG), reasons for late presentation and outcome of current management.

Methods: Prospective case series of 413 patient/eyes with LIG over a 12-month period in 1998; 311 of these patients underwent cataract surgery. Visual acuity and intraocular pressure (IOP) were pre- and post-operatively assessed.

Results: Four hundred and thirteen (1.5%) of 27,073 senile cataracts seen in the outpatient department of Sagarmatha Choudhary Eye Hospital, Lahan, Nepal presented with LIG. There were 298 (72%) phacomorphic cases and 115 (28%) phacolytic glaucoma. Pain for more than 10 days was reported by 293 (71%) patients. The majority, 258 (62.4%), travelled a distance of more than 100 kms to the hospital. The major reasons for late presentation were 'no escort' in 143 (34.6%) and 'lack of money' in 128 (31.0%) cases. At presentation the IOP was more than 30mm Hg in 327 (79%) eyes. Following cataract surgery, 251 (80.7%) had 21 mm Hg or less at discharge. The visual acuity was hand-movement or less before surgery in all eyes; at discharge 120 of 311 operated eyes (38.6%) achieved 6/60 or better, 97 (31.2%) less than 6/60, and 94 (30.2%) less than 3/60. The main causes for poor outcome in 94 cases were optic atrophy in 32 (34%) eyes, uveitis in 25 (26.6%) eyes and corneal oedema in 24 (25.5%) eyes.

Conclusion: The results highlight the importance of early diagnosis and treatment of visually disabling cataract. There is a need to educate both the patient and the cataract surgeon of the dangers of lens-induced glaucoma and of the poor outcome if treatment is delayed.

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Training of Trainers and Cataract Surgical Rate Workers (CSRWs)
November 12 – 16, 2001

- **Detection and Assessment of Cataract and other Eye Patients**
- **Social Marketing of Eye Work and Cataract Surgery**
- **Barriers between Patients and Eye Units**
- **Bridging those Barriers**

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Breaking Down Barriers
How to Increase the Cataract Surgical Rate
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Ocular Leprosy Report

Practical Eye Care Guidelines for Leprosy Patients: Workshop on Ocular Leprosy

High Leigh Conference Centre
Hertfordshire
United Kingdom

3–5 July 2001

Following this Workshop convened by **LEPRA*** and sponsored by **ILEP*** members, **CBM International** and **ICEH**, London, **Professor Gordon Johnson** and **Dr Paul Courtright** have kindly provided a short report and recommendations from the Workshop. While there is some overlap in content, the report and recommendations suitably complement each other.

Editor

Delegates to the Workshop

Brazil	Monica Maakaroun	Nigeria	Samson Akinyemi
Canada	Paul Courtright	Philippines	Jesus Ravanes
	Susan Lewallen	The Netherlands	Margreet Hogeweg
China	Tang Xin	Uganda	Keith Waddell
Egypt	Essam el Toukhy	United Kingdom	Timothy ffytche
Ethiopia	Taffessework Girma		Gordon Johnson
India	Shyamala Anand		Murray McGavin
	Ebenezer Daniel		Siobhan O'Dowd
	Sundar Rao		Doug Soutar
	Swapan Samanta		Mary Tamplin
Myanmar	Kyaw Nyunt Sein		Kirsteen Thompson

* **LEPRA (The British Leprosy Relief Association)** * **ILEP (International Federation of Anti-Leprosy Associations)**

Update on Ocular Leprosy

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Numbers of People with Leprosy

The widespread use of Multiple Drug Therapy (MDT) in leprosy control programmes has resulted in a great reduction in worldwide prevalence. There is a mixed picture from country to country, so that there is still a high incidence of newly diagnosed cases in some regions, for example in northern Brazil and parts of India. At the beginning of 2000 there were approximately 640,000 cases registered for treatment with MDT, and around 680,000 had been newly detected in 1999.[1] More than 10 million previous leprosy patients have been released from treatment (RFT), and removed from registers. Many of them have disabilities or the potential to develop disabilities. In countries such as China and South Korea, there are many elderly people with disabilities, some still living in leprosy settlements or colonies. In West Bengal alone there are 64 such settlements.

Leprosy and the Eye

It is recognized that there is more blindness in multibacillary (MB) patients with leprosy than in other people of the same age. This has been confirmed in a longitudinal study of leprosy (LOSOL) in India (301 patients recruited over 7 years) and the Philippines (289 patients). Severe visual impairment and blindness (less than 6/60) was 55% higher at disease diagnosis than in an age-standardised comparison group. This was due to cataract in 90%, the other main causes being lagophthalmos (failure to close the eyelids) leading to corneal opacity, and uveitis.

Vertical Leprosy Programmes are Becoming Integrated

Because of the success in reducing the prevalence of leprosy, governments are not prepared to continue to allocate money previously given to leprosy control programmes. There is also political pressure in WHO and by some governments to declare leprosy 'eliminated'. In consequence, specialised leprosy programmes are being closed and leprosy workers are being phased out or re-deployed. Tamil Nadu is the first state in India in which leprosy control has become fully integrated into the general health services; other countries are following the same pattern. Under these conditions there is a real danger that new cases will be missed, and disabilities will not be adequately dealt with. Therefore, guidelines for the responsibilities and training of general health workers must be rapidly developed. The eye care programme must also assume great responsibility.

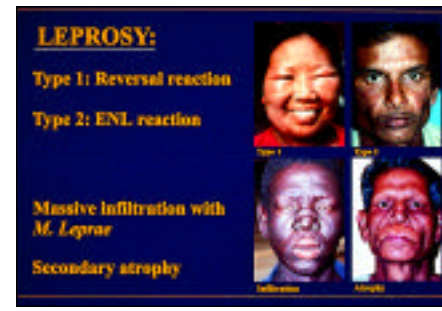
Some of the problems and opportunities associated with integration of leprosy care into Primary Health Care were identified at the Workshop.

1. A very large number of general workers will need training. For those already in service, ophthalmic assistants may be trained to do the training. For those Primary Health Care workers still in training, we must ensure that teaching about eyes in leprosy is included.
2. General workers may not welcome yet more responsibilities. It will be necessary to reduce the recommended tasks and technology to the minimum essentials.
3. Leprosy patients may be unwilling to accept these new workers and services. They may not have a choice; counselling at the time of change-over may help.
4. Organisational support will be needed at national, regional and district levels. In sub-Saharan Africa, prevention of blindness due to leprosy will, in practice, only survive within the general eye care programme. The reorganisation required as a result of the Vision 2020 initiative is an ideal opportunity to think how eye care in leprosy could be integrated. In some countries community rehabilitation workers may be involved in long term follow-up of RFT patients.
5. Under these circumstances it may be attractive for leprosy relief agencies to direct some support to general eye care programmes.

Three Groups of Leprosy Patients

The 3 groups which need to be considered are :

1) At the time of diagnosis with leprosy.
2) During the time of treatment with MDT.
3) 'Cured' patients, when finished with MDT and released from treatment.



The faces of leprosy

Photos: Margreet Hogeweg

1. *At time of diagnosis*

The setting in which the decision to treat will be made in India will be the Primary Health Centre (PHC), under the supervision of the PHC Medical Officer (PHC MO). Each centre may only see 5–10 new patients a year, of whom only one may have lagophthalmos.

It was agreed that the eyes of all new patients should be examined at diagnosis – for visual acuity; for lagophthalmos, indicated by lid gap or corneal exposure on 'mild closure', as in sleep; for a skin-patch around the eye or cheek; and for red eye. The visual acuity will be taken by any paramedic, and the patient inspected by the PHC MO if anything is found. The equipment required is an E-chart, torch and ruler.

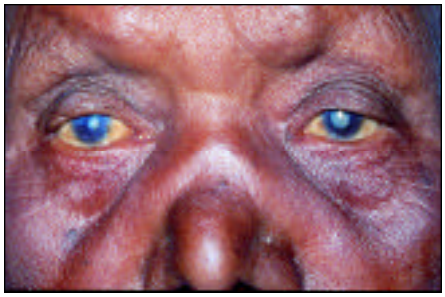
The MO will assess vision: < 6/60 in either eye, lagophthalmos or a red eye, and decide whether referral to an Ophthalmologist (Asia) or Ophthalmic Clinical Officer (Africa) is indicated. A lid gap >5mm is referred for surgery. If the lid gap is 5mm or less and there is a recent history, systemic prednisolone should be started; if not recent, the patient is counselled in self-care. When a skin patch is pale, the patient receives counselling; if red and raised, steroids should be started and the patient seen every month.

2. *During treatment with MDT*

(i) single skin lesion: seen at start of treatment only, no follow-up.
(ii) Paucibacillary (PB) leprosy, 6 months treatment: seen at 3 and 6 months, at the same time as patient checked for ulnar nerve involvement and foot ulcers.
(iii) MB leprosy, 1–2 years treatment: patient seen at least every 6 months, or more frequently if required by the Prevention of Disability Programme.

3. *At the time of RFT*

All patients will be educated about possible eye complications, instructed in self-care, and told to return if any



Leprosy and cataract

Photo: Margreet Hogeweg

adverse events occur. People with lagophthalmos of 5mm or less should be followed 6 monthly.

Lagophthalmos Surgery

The indications for referral for surgery are lagophthalmos of 5mm or more; any degree of lagophthalmos if reduced corneal sensation is found by the supervisor; any degree of lagophthalmos in a one-eye patient; and for cosmetic reasons.

The aim is to narrow the lid gap and cover the cornea. There is no agreement as to the best procedure, whether tarsorrhaphy, or horizontal lid shortening, including reconstructing the canthus. Temporalis muscle transfer is not suitable for routine use.

We need to improve the type of surgery, and obtain evidence as to what is the best procedure. We also need to understand why patients are not prepared to accept this surgery.

Cataract Surgery

In the past, because of small pupils, synechiae, iris atrophy, and the demonstration of the presence of leprosy bacteria in the iris even after a full course of MDT, Ophthalmologists have been reluctant to insert IOLs after cataract surgery. This is changing, and very good results with posterior chamber IOLs were reported at this Workshop. Apart from the improved optical results, IOLs avoid the problem of wearing aphakic spectacles when the bridge of the nose has collapsed, or the problem of handling them with deformed hands. Some surgeons use frequent topical steroid drops or systemic steroids post-operatively to reduce the risk of post-operative inflammation.

Conclusions

The gradual change-over from vertical leprosy programmes to an integrated programme for leprosy sufferers increases the responsibility on the staff of the eye care programmes to ensure that the patients are examined and operated on at the right time, and that general health workers are trained in leprosy eye care.

Reference

1 Weekly Epidemiological Record. 2000; No 28, 14 July; **75**:226-231
or www.who.int/lep/disease/wer7528.pdf

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Recommendations

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1. It is critical that leprosy patients (during their anti-leprosy treatment and after release from treatment) are integrated into general health and eye care programmes.

2. Integration will require close collaboration between leprosy control and prevention of blindness programmes. At the national, regional and local level, strong political commitment (including professional organisations) is needed. Integration will reinforce and complement Vision 2020 initiatives and support leprosy control activities.

3. Cataract is the leading cause of blindness in leprosy affected persons and many do not have access to general eye care services. All persons affected by leprosy should have equal access to eye care services. Education of health workers (including eye care staff) is required to ensure that leprosy patients gain access to eye care facilities.

4. At the time of disease diagnosis all patients should be examined for lagophthalmos (any gap), visual acuity, the red eye, and presence of a facial skin patch. All patients with lagophthalmos, decreased vision, persistent red eye, and/or a facial skin patch in reaction should be referred by the general health worker to a higher level.

5. We recommend that visual acuity and lagophthalmos become the major indicators for monitoring disability and that corneal hypoaesthesia, corneal opacities, and uveitis (which will be recognised as one cause of a red eye) are removed from the leprosy disability grading scheme.

6. At the end of treatment patients must be educated regarding the risk of eye disease and informed that they should return for examination if they develop lagophthalmos, diminished vision, red eye, or a facial skin patch in reaction. Explicit instructions need to be given to each discharged patient as to where to go. Patients with lagophthalmos should continue to be followed up.

7. A training component that addresses the skills and activities of health workers in relation to care of eyes in leprosy should be introduced into national plans. Plans should address the needs at different levels and should include the needs of existing health workers through supplementary courses. Health workers currently in training should receive appropriate teaching through medical, nursing and paramedical curricula. In every setting with a leprosy control programme, a practical referral system needs to be clearly defined. All referral points (staff) need to be educated regarding the eye care needs of leprosy patients.

8. In settings where there are leprosy colonies/villages it is recommended that at least annual screening eye examinations and treatment are conducted. Furthermore, patients in 'care after cure' programmes should have, as a minimum, annual eye care examinations and management.

9. Lagophthalmos surgery should be provided to patients who need it. Evaluation of the need for lagophthalmos surgery should be based on one or more of the following conditions:

- size of lid gap
- corneal exposure
- corneal hypoaesthesia
- visual acuity
- cosmetic appearance

There are a number of surgical procedures being used for lagophthalmos surgery. Research is needed to determine the best possible surgical procedures to correct the lagophthalmos and to improve functional and cosmetic outcomes of the surgery. Standardised routine monitoring of outcomes of lagophthalmos surgery is recommended. There are many barriers that prevent patients from accepting lagophthalmos surgery which need to be clearly identified; programmes need to be developed to increase uptake of lagophthalmos surgery. Finally, ophthalmologists and other relevant surgeons need to be trained in good quality lagophthalmos surgery.

10. Research shows that cataract surgery with IOL implantation, even in patients with evidence of chronic uveitis, can provide a good quality outcome. IOL implantation,whereavailable,shouldbepromoted among leprosy patients who need cataract surgery. The outcomes of cataract surgical services need to be routinely monitored.

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Assessment of Learning

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So far in this series we have looked at how people teach and learn. We have discussed how we should go about planning a curriculum, and we have considered the methods that are available for us to use when we teach. In this article we look at a critically important aspect: the assessment of learning. Why is it so important?

Assessment is the Heart of Learning

Assessment drives learning. Students take great trouble to find out exactly what the examination will be like. Why is this? Because they want to pass the examination, of course! There is always too much to learn, so it makes sense to concentrate on what you need to know to pass the exam. We may want our students to be able to make diagnoses – but if our tests only test facts, the students will quickly learn just to memorise facts. If, on the other hand, they know that the test consists of clinical problems to diagnose and manage, they will study each clinical problem in such a way that they understand it well enough to diagnose and manage it. If there is no practical in the exam the students will stay out of the clinical areas to spend all their time with their books. But if they know there is going to be an OSPE* they will spend time with patients to make sure they have mastered all the skills.

REMEMBER: ASSESSMENT DRIVES LEARNING!

What does this mean, practically? It means we have to plan our assessment very carefully, in such a way that our students will learn what we want them to learn. If we want students to learn how to manage patients, our exam questions must be patient case studies in which we ask students what their management will be.

Why do we Assess Students?

The main reason is obvious: we want to see if they have learnt what we have taught them. This kind of assessment, which is done at the end of a period of teaching, is called *summative* – it is a 'summary' of what the students have learnt. But there are also other reasons for assessment:

- Assessment is very important for our students, because it shows them where they are falling short. That it why teachers should always discuss exams with students afterwards, to show them what the right answers were, and where they made mistakes. For the same reason, students must be given their marks, and their exam scripts, as soon as possible. Assessment which is done in this way, while the students are still learning, is called *formative* – we are 'forming' or 'improving' the students.

Skill/enabling factor to be examined	Suitable assessment method
Manual skill	
• Performing a tarsal rotation procedure	• The student has to *perform* the operation on a patient with upper eyelid entropion, while the teacher watches and marks her/ his performance with a *checklist.*
Communication skill	
• Educating a family on how to prevent trachoma	• The student has to *educate* a family on the prevention of trachoma, while the teacher watches and gives marks with a *checklist.*
Decision making skill	
• Diagnosing and treating a case of trachoma	• The student is presented with a patient suffering from trachoma. S/he has to *examine* the patient and make a diagnosis, while the teacher *watches*. • The teacher can also give the students a *written case study,* which gives the history and examination findings, and ask them how they would manage the patient.
Knowledge	
• Knowledge of symptoms, signs, stages, the organism, medication, anatomy, spread, prevention, etc.	• *Written* examination with short questions, MCQs, essay questions. • *Oral* examination.
Attitude	
• An attitude of concern and caring	• The teacher *observes* the student as s/he works in the clinic. After a week or so the teacher uses a *checklist* to make a final assessment of the student's attitude.

- We are training health workers to do a job. To protect society, we should only send out students who are *safe* – who know their work well enough not to harm anybody. One of the reasons for our final examination of students is to make sure that they are safe. Society expects us to do a good job!

Assessment should be *Valid*

Good assessment is *valid*. *This means that it tests what it is supposed to test.* Perhaps you want to test your students, to see if they can measure intraocular pressure. You can ask them to write short notes on how to use a Schiotz tonometer – but that will not tell you if they can really do the job. Your method of testing is *not valid*. A better way is to stand by and watch them while they do it with a patient – then you will really know if they can do it. This second method of testing is *valid*.

In an earlier article we discussed the domains of learning. We saw that each domain is taught in a different way. The same is true of assessment – we assess each domain in a different way. In the table below you will find examples of how we should assess the learning of our students, for each domain:

If you follow the guidelines in this table, your assessment is likely to be valid – it will test what it is supposed to test.

Some teachers like to ask 'trick questions' to catch out their students. Others like to ask questions about very rare, very obscure diseases. Such assessment is not valid. Valid assessment should be straightforward, and should focus on the 'must know' and 'must be able to do' – the things that are really necessary for day-to-day practice.

Assessment should be *Reliable*

Good assessment is *reliable*. This means that if we repeat the assessment on the same student at another time, or use another examiner, the mark will be the same.

Some forms of assessment are more reliable than others. An OSPE* is more valid than old-fashioned practicals which use different patients for different students. A written exam (where everyone gets the same questions) is generally more reliable than an oral one (where different candidates get asked different questions by different examiners).

You can make any form of assessment

'Assessment' or 'evaluation'?

These two words have different meanings for different people. In the UK people 'assess' students to find out if they have learnt, and they 'evaluate' programmes, to see if they are effective. In the United States the two words are often used the other way around – they 'evaluate' students and 'assess' programmes. It doesn't matter which word you use, as long as you tell other people what you mean.

Multiple Choice Questions – beautiful but deadly?

MCQs consist of a leading statement or *scenario*, followed by a number of answers or *options* for students to choose from. They have become very popular and they are also very easy to mark. On the other hand they have a number of serious drawbacks:

- Examiners tend to use them to assess facts, rather than patient management
- If there are only two or three options, students may get marks from guessing
- Research has shown that students very often misunderstand them.

For all these reasons MCQs often have low *validity*. They have to be carefully tested for comprehension, before being given to students to use. People who write MCQs should receive some form of training first, or consult a textbook.

more reliable by giving a little thought to the matter. Practical exams are more reliable if you use a checklist to mark the student's performance. Written exams are more reliable if the markers are guided by a very clear document which shows how marks are allocated for each question.

Finally: teachers often spend more time on preparing lessons and teaching them, than they do on assessing the results. Any time you spend on improving your assessment will be richly repaid – your students will be better learners as a result.

The next article in this series deals with the resources that teachers and students need. Watch this space!

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*What is an OSPE?

The OSPE is a special kind of examination that is now commonly used. What do the letters mean?

- **O** stands for **Objective**. If different students are given different patients to examine, this could be unfair: some patients and conditions are easier to examine than others. So, in this examination, every student gets the same patient – that is why we say it is objective.
- **S** stands for **Structured**. Several skills are tested at one time. Each skill is tested in a separate room, called a station. At each station there is a card with clear instructions for the student; all the equipment s/he needs; a patient (if necessary); and an examiner with a checklist for doing the marking. There may be ten such stations in an OSPE, and ten students are then examined together. Each starts at a different station, and after 10–15 minutes a bell rings and they move on to the next one.
- **P** stands for **Practical**. This means that this exam is practical – it only tests the skills of the students. It could be manual skills, like examining the anterior chamber of the eye, or it could be a communication skill, like taking a patient's history. (Some people prefer the word Clinical – so that makes their exam an 'OSCE'.)
- Finally, **E** stands for **Examination** – no surprises there! Good OSPEs are an excellent way of examining skills. They take a lot of time and preparation, but so do all practical examinations.

Bilamellar Tarsal Rotation

Dear Editor

In 1994 you published a review of this procedure (*J Comm Eye Health* 1994; **7**: 21–26). We are indebted to Mark Reacher and colleagues for the clear description and the good research underlying it. It is easier to do and to teach than the Trabut-type operation. Even so I find it tricky to get consistently good results. With the millions needing surgery around the world (often by paramedicals and with no follow-up) it is clearly important to make it as fail-safe as possible. I have some comments about the points I find difficult and would like to hear other people's experience.

The hardest part (but vital to success) is to make a good incision at the correct level. I find holding the lid margin in two artery forceps whilst cutting is not easy, and I worry about crushing the edge. It would be much easier to be able to stabilise the lid in a clamp and cut down through both lamellae onto a base plate that protects the eye. A Cruickshank forceps with the plate in the conjunctival sac can work, though not in very deformed lids. A large ring clamp is similar. Could a special one be designed? It is much easier to identify, clamp and safely tie the marginal artery when the tissues are stable. Otherwise, the operation is hampered and serious bleeding can recur later (I was once up all night!).

Three double armed sutures are recommended for each lid. As our patients come from afar we have to use absorbable material, and six atraumatic sutures (two lids) are too costly. I find one single armed absorbable suture will do for it all, starting and ending above the lashes (I prefer 5/0 or 6/0). It is also easier to catch the upper tarsal plate fragment on the front near its edge with a part-thickness side-to-side bite. This also avoids the stitch rubbing the cornea. The stitches can be tied one at a time, or left long and tied after all are in place. The correct tension is very difficult to judge and I have often had over-correction. I tried trying the stitches with a bow to allow adjustment next morning without resuturing, but the sutures are then too sticky to loosen (though using a bow during the operation is useful, allowing readjustment at the end). I now realise that it is essential to judge the correct tension with the patient looking directly ahead (at your face), because over-correction can be obscured on downgaze. This means the patient must not be squeezing; if they find relaxing is impossible, a van Lint-type facial block helps.

Finally two questions: is it necessary to suture the skin edges, as they usually lie neatly together? For the grossly thickened and deformed tarsal plate we sometimes see, is this the best operation, or is the Trabut more certain for these?

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Car Seat Belts

Dear Editor

We read the letter by Margreet Hogeweg *(J Comm Eye Health 2000*; **13**: 62) and we agree that one of the main causes of corneal perforation and ruptured globe is road traffic accident. In Yemen, ocular trauma is a significant cause of unilateral blindness.

In a recent retrospective study performed in Al-Thawra Hospital in Sana'a, Yemen we found that road traffic accident accounted for 42% of all eye injuries that required surgical intervention. Perforating injuries (ruptured globe with iris prolapse) were the most common ocular trauma treated and accounted for 67.8%.

Most patients were in the first three decades of life and were male; 82.8% of the patients were under 30 years of age. Young males were found to run a higher risk of ocular accidents, especially from road traffic accidents, gunfire and bomb explosions.

Roads are not safe in Yemen because driving licence regulations are not enforced. We don't have any regulations to wear car seat belts and many people drive without a driving licence. Unfortunately, children under the age of 16 years old can drive cars.

Health education and safety strategies should consider targeting the road traffic accidents in Yemen for the prevention of these serious eye injuries. Wearing seatbelts has to be introduced as a law, similar to our neighbouring countries Saudi Arabia and Egypt.

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Chloroquine

Dear Editor

A Cause for Concern

The recent decision by some African countries to initiate the 'Roll Back Malaria' programme (RBM) is a good one, especially with theincreasingnumberofdeathsfrommalariaanditscomplications.

The idea of allowing presumed malaria sufferers to buy chloroquine across the counter, by making the dosage regimen available to everyone, is however a cause for concern. I foresee chloroquine replacing analgesics for relief of mild aches and pains. This definitely may result in abuse of the drug, resulting in its accumulation in the body, which may cause visual impairment.

The RBM programme should not run as a vertical programme. Instead, it should be incorporated into the already existing primary health care system; thus, chloroquine will only be given in health centres, where staff who are aware of its complications are present.

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Cataract Surgery

Dear Editor

There is still a place for intracapsular cataract extraction (ICCE), especially in remote areas of developing countries. The main reasons are known to all who have practised in developing countries or who have experience travelling in remote areas.

John Sandford-Smith (*J Comm Eye Health 2000*; **13**: 62) mentioned that in northern Nigeria they still practise couching rather than ICCE. That is the method they can afford. It is not unusual to find well-trained personnel in those areas but they lack essential instruments. Even those patients who have ICCE surgery lack spectacles which may not be available or be available but expensive.

I agree that IOL implant surgery has excellent results compared to the previous technique. The major problem is the unavailability of the equipment, although it may be easy to train the existing personnel who are readily available.

The DU – AL Corporation* still has much to contribute, as their equipment could be carried to the remotest areas without difficulty. I have used their cryoextractors for ICCE ever since I qualified from ICEH, London, in 1986. Post-operative results are very good.

If we want to promote IOL implant surgery in full capacity let's follow the recommendations of Dr David Yorston in his article in this Journal (*J Comm Eye Health* 2000; **13**: 51–52).

You, as Editor, have the means of evaluating what is written and recommended in most of our Community Eye Health Journals. Please give ICCE time – it will phase out as soon as we reach our goals of supporting the Districts and Regional Eye Workers with essential instruments.

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Restored Sight Projects Ltd.
Singleton Court, Wonastow Road
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Dear Editor

I am now retired 11 years after 35 years practice in India, much of it in cataract work among rural communities. The letter by John Sandford-Smith and its subject captured my interest as I had prepared a similar article while I was on a working visit back to my old territory in 1992. My thesis was, and still is, akin to the subject of John Sandford-Smith's letter (*J Comm Eye Health* 2000; **13:** 62).

In some parts of India, the mounting backlog of cataract patients is indeed being brought under control with the use of surgery by ECCE + IOL insertion. Around Delhi is one such area. However, in many rural areas cataract surgery of any sort remains unavailable at the local level. Government eye doctors rarely ever visit such places. All my work was in the State of Bihar, the area now known as Jharkhand. Towards the end of the '80s when ECCE-IOL was becoming available in India, a team capable of this method came our way for a week. The results were indeed good, but each operation had lasted 15–20 minutes, and some of the day's prepared patients had to be put off until the next day. We had been used to ECCE or sometimes ICCE with no implants and no sutures. One extraction was completed in 3–5 minutes. Yet the overall incidence of cataract in the area was not being reduced. If we had all switched to the new team's technique then, numerically, many patients would have been the losers, though some of those operated on may indeed have benefited in some ways.

My contention is that where a cataract backlog remains, those qualified to carry out cataract surgery should maintain a flexible approach in those rural areas where so many patients with mature and hypermature cataracts still exist. Most of the older, mature cataract patients in those areas are illiterate. They do not particularly want to be able to read. All they require is vision to enable them to get about their own homes again, and their local market, without the need for someone to guide them. A simple, quick operation is enough for them. For the time being, I see a place for any 'quick' operation which, properly applied, will help to reduce cataract waiting lists. Once cataract waiting lists are coming down and show signs of being under control, then yes, by all means, settle on a regime to restore all patients' vision to as near 6/6 as you can get, cost problems being dealt with at the same time.

End piece: after their successes around Delhi I heard that there were so few cataracts left for the doctors to do, that they started on patients with 6/24 vision or better. It kept their hands in! Sadly, they did not consider going to those places where many mature cataracts are found.

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Formerly
Medical Superintendent
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Dear Editor

'Is there still a place for Intracapsular Cataract Extraction…?'
(*J Comm Eye Health* 2000; **13**: 62**)**

Thank you for bringing this subject up for discussion. During most of my time at Enongal, we were not equipped for extracapsular cataract extraction. A Lions Club team had been past before I arrived, brought a microscope with them, and did extracapsular cataract extractions with posterior chamber lens implants; a few of their patients did very well, but most did badly. The problems we noticed with these patients were mostly 'inflammatory' – pupil membranes and thickly opacified capsules, sometimes with displacement of the lens implant. Our general experience was that intracapsular cataract extraction was more reliable in giving moderately good results for most people.

Our colleagues at Acha Tugi in northwestern Cameroun routinely used extracapsular cataract extraction and reckoned to get good results – but they used huge doses of steroids that were not available at Enongal. They commented too that there seems to be a change as you go westwards across equatorial Africa: east African eyes generally react mildly to being operated on, but in Cameroun at least, eyes react very briskly. David Yorston from Kikuyu in Kenya has commented on a minority of patients there who have an unusually brisk inflammatory reaction after cataract surgery (*Br J Ophthalmol* 2001; **85**: 267–71, and *Br J Ophthalmol* 1999; **83**: 897–901), but patients of this sort seem to be the majority in Cameroun. We also noticed that glaucoma is common and aggressive in Cameroun, and that many patients have a lot of Tenon's capsule stuck down on the sclera. Might there be some local factor (genetic, perhaps?) which links these phenomena?

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Dear Editor

Which form of cataract surgery in developing countries?

This letter is in response to the letter by John Sandford-Smith on the desirability or otherwise of intracapsular cataract extraction (ICCE) surgery in many developing countries (*J Comm Eye Health* 2000; **13**: 62). It is indeed true that in some developing countries (like northern Nigeria) the practice of couching has increased in relation to cataract surgery, especially in rural areas. This is of course a cause for concern for eye care personnel in this part of the world. A recent study in a rural community of northern Nigeria revealed that couching of the eye is being practised 5 times more than cataract surgery. What are the factors that tend to make people have couching rather than cataract surgery? There are 3 main reasons for this attitude in most parts of northern Nigeria.

1. Couching is more readily available to the people than cataract surgery. Many couching practitioners now move from village to village to solicit clients (people with cataract or at times any eye problem) on whom they will practise their trade. They conduct their services often within the premises of their patients/clients without any delay. Thus, couching is mostly done on the first visit. Cataract surgery often requires the poor villager to travel long distances several times before having the surgery. In some instances the service (i.e., cataract surgery) is just not available.
2. Couching is often more affordable to these poor people. Some couching practitioners are paid in kind (e.g., by receiving agricultural products), instead of money. Sometimes services are paid only after the patient is satisfied with the outcome of the couching. This is in contrast to surgery where the patient is required not only to pay in money, but to pay before surgery. Even if the surgery is free the indirect cost involved (travel cost, lost wages, etc.) in accessing the surgery is an enough hindrance to the surgery.
3. The visual outcome of couched eyes may be better than some cataract surgery eyes, especially eyes after intracapsular surgery (ICCE) which is basically the form of operation done in outreach activities and many peripheral hospitals in Nigeria. Indeed we have encountered several couched eyes with much better vision than ICCE post-operative eyes. Even ICCE eyes with good visual outcome may not be better than a well performed couched eye, as the couching practitioners have learnt to issue +10 aphakic spectacles to their clients.

So the poor villager with cataract can have his eyesight restored instantly by a few minutes couching procedure in his own house without having to travel, without leaving his family, without leaving his village, without several visits and at an affordable rate or agreeable terms. More importantly, the sight of the couched eye is restored with the same aphakic spectacles which the ICCE eyes will require post-operatively.

The point here is that a well performed couched eye may be equal in visual outcome to well performed cataract surgery (ICCE) in our environments. As such, my opinion is that apart from attempts at overcoming barriers relating to unaffordability and inaccessibility of cataract surgery in our part of the world , we necessarily have to provide a cataract service that is competitively better in outcome than the best couched eye – a cataract service that will inspire confidence in the people. This requires that the visual outcome of the post-operative surgical eye will be obviously better than the best couched eye with aphakic spectacles. That procedure, I believe, is extracapsular cataract extraction with posterior chamber IOL (ECCE+PCIOL) or possibly ICCE with anterior chamber IOL (if its safety is assured).

With low-cost IOLs, portable low price operating microscopes, I believe cost may not be a problem. Furthermore, more ophthalmologists in developing countries are abandoning ICCE and getting well acquainted with the IOL surgery. Governments, eye care personnel and NGOs in developing countries should face this challenge. Cataract outreach programmes, as well as the routine form of cataract surgery in hospitals should be ECCE+PCIOL as much as possible, rather than the lower quality ICCE.

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Dear Editor

I write in response to Dr John Sandford-Smith's letter on intra capsular cataract extraction (*J Comm Eye Health* 2000; **13**: 62). In my experience, most ophthalmologists prefer ECCE with PC IOL to ICCE, because ICCE, the traditional method, has the potential complication of cystoid macular oedema. This is much less common in ECCE. However, there are a number of problems associated with ECCE plus IOLs.

1. IOLs remain expensive for most of the population of poor countries, especially when we consider that food is the first priority, even for the blind.
2. There is limited access to operating microscopes and laser equipment in many developing countries. When available, they are based in urban centres where most ophthalmologists also live. The bus fares necessary to reach the service are a big burden for the poor.
3. Difficult access to YAG lasers is the biggest problem. People may have to be referred to other countries to get this service.
4. As many people are aware, in developing countries patients do not follow the service, but services should follow them. This means giving priority to social and economic factors, local beliefs, religious taboos or fear of witchcraft, and making every effort to provide health education. Charging for IOLs in this kind of society will be a further barrier to stop people seeking surgery.
5. I have to say that it is not true that in a developing country an aphakic patient without an aphakic correction is good for nothing. He or she can improve from light perception to counting fingers, which enables the patient to walk around, and this is a significant gain amongst poor blind people in developing countries.

Therefore, if we are to abolish ICCE in developing countries, various facilities need to be provided and maintained, remembering that electricity and reliable water supplies are still the exception rather than the norm in many countries.

It is necessary to have:

- Cheap portable microscopes with good co-axial illumination
- Very cheap IOLs, viscous fluid and BSS solutions
- YAG lasers which can be afforded and operated in third world countries.

More consideration needs to be given to ICCE with A/C IOL which does not need access to microscopes and YAG laser facilities. I think this may be preferable in many developing countries. However, I remain in a dilemma because most ophthalmologists give much less priority to this method.

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Leprosy and the Eye

Author : Dr Margreet Hogeweg

A slides/text teaching set includes 24 colour slides (46 photographs/illustrations) and a handbook/text of 40 pages.

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 many more.

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.

Ordering Information

Developing Country Rate: 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.

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

Photos: Margreet Hogeweg

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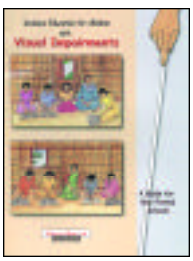
Book Review

Inclusive Education for Children with Visual Impairments



A Guide for Non-Formal Schools

Published by:

Technical Assistance for the Education and Rehabilitation of the Blind Helen Keller International, Bangladesh House 38, Road 14 A, Dhanmondi Dhaka – 1209, Bangladesh Email: amin@hkidhaka.org

This book provides guidelines for non-formal schools. It aims to motivate and encourage the necessary interaction for inclusive education within typical school activity.

The 84 pages comprise 11 sections. The first section sets the scene in story form about two Bangladeshi children who are visually impaired, emphasising their abilities and progress at school and explaining how their needs are met by thoughtful teachers and friends.

Subsequently, the text explains eye diseases specific to children and how these may be recognised and/or prevented. The diseases are addressed in practical terms, highlightingtheeffectsondailylivingskills and how these effects can be managed.

Advice is provided on classroom teaching and suggests activities to encourage participationbythevisuallyimpairedchild.

Reading and writing of print and Braille and the use of Low Vision devices is covered simply but comprehensively. Practical ideas are provided for teaching mathematics, orientation and mobility, use of the white cane and also leisure activities.

Each chapter sets exercises to test the readers learning and suggests an activity for implementing and applying the knowledge gained thus far.

The black and white illustrations are excellent and culturally appropriate for an Asian setting. Permission is granted for reproduction of these and the text for individual teaching requirements.

This book provides thoroughly enjoyable reading and will prove a valuable tool in raising awareness and motivating schools to integrate visually impaired children into their programme.

Sue Stevens