Significant progress is being made in addressing the cataract blindness problem in parts of the developing world. For example, surgical coverage among those afflicted by bilateral blindness because of cataract has been shown to exceed 75% in parts of India, particularly among the literate and urban residents. Considering that all cataract blind persons are not candidates for surgery because of co-existing ocular pathology or other medical contraindications, surgical coverage at these levels may be approaching a natural upper limit. Expanded prevention of blindness efforts, such as those currently underway in India, appear to be having a favourable impact on the cataract blindness ‘backlog’.

**Visual Acuity Outcomes**

It is also becoming evident, however, that much more attention must be given to improving visual acuity outcomes among those who have had cataract surgery. Recent population-based surveys in several countries have shown that 40–75% of post-operative eyes have a presenting visual acuity worse than 6/18, with as many as 50% worse than 6/60. This high proportion of cataract-operated cases with poor vision is a matter of great concern. Many cataract patients are not experiencing the level of vision restoration possible with modern day surgery. A clinical trial of cataract surgery at the Aravind Eye Hospital in India suggests that four years after surgery no more than 25% should have presenting visual acuity worse than 6/18; and with best corrected vision, no more than 5% should be in this category. It might be expected that cases operated on in recent years are faring better than earlier cases. This is generally not the case, however, as was shown in the referenced surveys where a cross-sectional sample of patients, some operated on near the time of the survey and others operated on decades earlier, were evaluated.

**ICCE or ECCE without IOL versus IOL Surgery**

These surveys also showed that aphakic patients who received intracapsular cataract extraction (ICCE), or extracapsular cataract extraction (ECCE) without an intraocular lens (IOL), were at a disadvantage compared to those who received IOL surgery. (Unfortunately, it was common for those with aphakia to present without the necessary spectacles.) Uncorrected aphakia and other refractive error accounted for up to half of the vision impairment seen in aphakic eyes. Although the differential between IOL and non-IOL patients narrowed when best-corrected vision was considered, it is presenting vision that represents the actual circumstances under which people function in day-to-day activities. Accordingly, the measurement of visual acuity with the presenting correction, if any, not best-corrected measurement, is what counts when assessing the vision restoration benefits achieved through cataract surgery.
Factors Contributing to Post-operative Visual Impairment and Blindness

Even though surgical coverage may be on the rise, a proportionate decrease in the prevalence of cataract blindness will not be realised if a substantial number of those already operated on for cataract are still blind. To illustrate, the prevalence of cataract visual impairment and blindness (≥ 6/60) among those ≥ 50 years of age in a rural area of India was found to be 8.1%. This dropped to 5.7% if those who were already operated on, but were visually impaired, are excluded from the calculation. 6

Multiple factors undoubtedly contribute to poor visual acuity among the cataract-operated: a less than favourable surgical setting, such as found in surgical camps; a less than competent surgical technique; inappropriate selection of surgical cases; or perhaps inadequate patient follow-up. It is apparent that patients operated on in well-equipped facilities by experienced surgeons do better. Patient hygiene and behaviour are also important. As already noted, not wearing aphakic spectacles will, by itself, result in a poor outcome among ICCE cases.

It appears that much of the visual impairment in operated eyes is uncorrectable because of surgical complications. Other ocular pathology, which may have been co-existing at the time of cataract surgery, or that which manifested itself later, is also responsible for some of the poor outcomes. From the perspective of the patient, however, the reason behind the poor outcome is less important than the fact that poor vision exists. The patient may not be able to distinguish between vision deterioration associated with the onset of new ocular pathologies versus that associated with surgical complications or undetected co-existing disease. Patients with poor vision may conclude that cataract surgery is only partially, or temporarily, effective in restoring sight, if at all. This message may be communicated to those still contemplating whether to seek such surgery and, thus, serve as a deterrent to care.

It is evident that poor visual acuity outcomes among those operated on for cataract are not limited to any one area or country. Studies in different parts of China, India, and Nepal all point to the need for greater recognition of less than desirable outcomes and the necessity for remedial action.

The Goal of Good Surgical Outcomes

The cataract blind, and particularly those in poverty, must overcome numerous socioeconomic barriers involving significant sacrifices to obtain treatment. We must do more to ensure that, to the greatest extent possible, the result is complete sight restoration. The ability to produce consistently good surgical outcomes is becoming even more important as patients in developing countries are increasingly seeking cataract surgery earlier, before visual impairment has had a significant economic and social impact. Not only do patients with early cataract have nothing to gain by unsuccessful surgery, they have vision to lose.

In the articles that follow, Drs. Dandona, Limburg, Cook, Thomas and Kuriaiko further discuss cataract surgery outcomes and what can be done to improve them.

References

6 Murthy GVS, Ellwein LB, Gupta S, Tanikashalam K, Ray M, Duda VK. A population-based eye survey of older adults in a rural district of Rajasthan. II. Outcomes in cataract surgery. (Submitted).


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What Do We Mean by Cataract Outcomes?

Lalit Dandona MD MPH
Director
International Centre for Advancement of Rural Eye Care
L V Prasad Eye Institute
Banjara Hills
Hyderabad – 500 034
India

Hans Limburg MD PhD
Senior Research Fellow
International Centre for Eye Health
Institute of Ophthalmology
London ECIV 9EL, UK

Cataract outcome is the result of surgical intervention for visual impairment or blindness due to cataract. It can be measured as visual acuity in the operated eye or in the patient, in terms of function, as quality of life and as economic rehabilitation. Of these, visual acuity is most suited to measure performance and monitor quality of service.

Clinical Trials: India and Nepal

Table 1 shows the outcome of cataract surgery in clinical trials under optimal conditions. More than 90% of eyes with cataract achieve a best-corrected visual acuity of 6/18 or better. The variation in visual outcome between various surgical techniques is minimal. Less than 3% of the operated patients had a best-corrected vision of less than 6/60. These clinical trial results may reflect one end of the spectrum, suggesting what may be possible in an ideal setting under very controlled circumstances. While setting general standards for hospitals in a developing country situation, this aspect would have to taken into account.

Population-based Surveys in Asia

However, recent population-based surveys have shown that of all the patients operated on for cataract, 21-33% had a presenting visual acuity of less than 6/60. With best correction, 11-21% still had acuity less than 6/60 (Table 2). These figures include patients operated on recently as well as those who had surgery decades earlier. They include operations done under excellent as well as less favourable conditions, by experienced as well as less experienced eye surgeons. In brief, these results reflect the vision after cataract surgery in a cross-section of the population.

WHO Workshop on Outcomes, 1998

Poor visual acuity following surgery will affect the demand and uptake of cataract surgical services. Concerned about these results, the World Health Organization convened a workshop on Outcome in Prevention of Blindness Programmes in 1998. It recommended the development of a simple method to monitor and evaluate outcome following cataract surgery in terms of visual acuity, which can be assessed with full spectacle correction (‘best vision’) or with available correction (‘presenting vision’). The purposes of such a tool would be:

- to identify causes of poor outcome of cataract surgery
- to improve the outcome of cataract surgery
- to increase the output of cataract surgical services.

Table 3 indicates outcome results which have been suggested to be adequate. These guidelines, however, do not specify a time frame for the assessment of outcome, the condition ‘cataract’ has not been specified, the cause of poor outcome is not assessed, and an instrument to measure outcome of cataract surgery has not been provided.

Hence, there is a need for more operational research into these issues, and to standardise follow-up periods and conditions for visual acuity assessment. The aim of the monitoring tool is self-audit, not to compare outcomes between surgeons or institutions.

To measure visual outcome, individual patient records with well recorded pre- and post-operative visual acuity have to be analysed by tally sheet or by computer. Operated eyes with a presenting vision less than 6/60 should be examined to assess the major cause of poor visual outcome. Causes of poor outcome can be classified as:

- pre-existing eye disease
- surgical or post-operative complications
- refractive errors
- late post-operative complications.

In most of the population-based studies listed in Table 2, inadequate refractive correction and surgical complications were the major causes of poor outcome. Knowing the cause of poor outcome will enable eye surgeons and centres to address these causes and improve outcome, thereby improving the overall visual outcome for patients who have undergone cataract surgery.

Table 1: Visual Acuity by Percentage in the Operated Eye Following Cataract Surgery at 1-Year Follow-Up, in Hospital Based Studies in India and Nepal.

<table>
<thead>
<tr>
<th>Visual acuity</th>
<th>Madurai, India</th>
<th>Lahan, Nepal</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>ICCE + specs</td>
<td>ECCE + specs</td>
</tr>
<tr>
<td>Presenting acuity</td>
<td>(n=1401)</td>
<td>(n=1469)</td>
</tr>
<tr>
<td>6/6 – 6/18</td>
<td>84.9</td>
<td>83.9</td>
</tr>
<tr>
<td>&lt;6/18 – 6/60</td>
<td>2.9</td>
<td>15.4</td>
</tr>
<tr>
<td>&lt;6/60</td>
<td>12.2</td>
<td>0.6</td>
</tr>
<tr>
<td>Best acuity</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6/6 – 6/18</td>
<td>95.5</td>
<td>90.1</td>
</tr>
<tr>
<td>&lt;6/60</td>
<td>1.6</td>
<td>0.6</td>
</tr>
</tbody>
</table>

*Caption for Table 1: Visual Acuity by Percentage in the Operated Eye Following Cataract Surgery at 1-Year Follow-Up, in Hospital Based Studies in India and Nepal.*
Cataract Outcomes

Rapid Assessment and Monitoring Outcomes

Population-based rapid assessments of cataract surgical services are very useful to assess prevalence of cataract blindness and (pseudo) aphakia, cataract surgical coverage, barriers to cataract surgery and outcome. This is an average, long-term outcome, since past surgery varies greatly and patients would have been operated on by many surgeons in various settings. The causes of poor visual outcome can also be assessed. But because the impact of new improvements will be ‘diluted’ by old cases, population-based assessments are not the right tool to monitor short-term change. Routine monitoring of visual outcome of cataract surgery by individual surgeons or eye centres will increase awareness of outcome and provide a tool to achieve better results, thereby resulting in better ability and capacity to reduce cataract blindness.

Table 2: Long-term Outcome of Cataract Surgery from Population-based Studies in Asia

<table>
<thead>
<tr>
<th>Place</th>
<th>Year published</th>
<th>No.of eyes</th>
<th>With available correction</th>
<th>With best correction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nepal</td>
<td>1998</td>
<td>220</td>
<td>30.5 (24.4–36.6)</td>
<td>10.9 (6.8–15.0)</td>
</tr>
<tr>
<td>Shunyi, China</td>
<td>1998</td>
<td>116</td>
<td>44.8 (35.8–53.8)</td>
<td></td>
</tr>
<tr>
<td>Doumen, China</td>
<td>1999</td>
<td>152</td>
<td>52.6 (44.7–60.5)</td>
<td>21.0 (14.5–27.5)*</td>
</tr>
<tr>
<td>Karnataka, India</td>
<td>1999</td>
<td>2401</td>
<td>26.4 (24.6–28.2)</td>
<td></td>
</tr>
<tr>
<td>Ahmedabad, India</td>
<td>1999</td>
<td>776</td>
<td>24.0 (21.0–27.0)</td>
<td></td>
</tr>
<tr>
<td>Hyderabad, India</td>
<td>1999</td>
<td>131</td>
<td>21.4 (14.4–28.4)</td>
<td>16.8 (10.4–23.2)</td>
</tr>
<tr>
<td>Punjab, India</td>
<td>2000</td>
<td>428</td>
<td>23.1 (19.1–27.1)</td>
<td></td>
</tr>
</tbody>
</table>

*40% <6/60 with pinhole correction

Table 3: Adequate Outcome Results

<table>
<thead>
<tr>
<th>Post-operative acuity</th>
<th>Available correction</th>
<th>Best correction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Good</td>
<td>&gt;80%</td>
<td>&gt;90%</td>
</tr>
<tr>
<td>Borderline</td>
<td>&lt;15%</td>
<td>&lt;5%</td>
</tr>
<tr>
<td>Poor</td>
<td>&lt;5%</td>
<td>&lt;5%</td>
</tr>
</tbody>
</table>

References

How to Improve the Outcome of Cataract Surgery

Colin Cook MBChB
FCS(Ophth)SA FRCOphth
Prevention Programme
PO Box 899
Hilton 3245
South Africa

What are the Reasons for Poor Outcome Following Cataract Surgery?

There are 4 reasons for poor outcome following cataract surgery:

1. Case Selection (‘Selection’)
   - The outcome in eyes with significant other pathology is likely to be poor. Diseases such as chronic glaucoma, age-related macular degeneration and diabetic retinopathy may be present with age-related cataract, and will result in a poor outcome following cataract surgery.

2. Surgical Complications (‘Surgery’)
   - Poor surgery with intraoperative complications is likely to result in a poor outcome.

3. Uncorrected Refractive Error (‘Spectacles’)
   - Significant astigmatism or uncorrected ametropia following cataract surgery will result in a poor outcome.

4. Post-operative Complications (‘Sequelae’)
   - These complications may be early or late. Persistent inflammation in the early post-operative period and posterior capsule opacification in the late post-operative period may result in a poor outcome.

What Can We Do About It?

1. Case Selection
   - (1) All patients should have a thorough examination before surgery, to exclude significant other pathology. A common misdiagnosis in African patients is to diagnose cataract as the cause of poor vision in a patient with advanced glaucoma and nuclear sclerosis or insignificant lens opacity, and in Caucasian and Asian patients to diagnose cataract in a patient with age-related macular degeneration and nuclear sclerosis or insignificant lens opacity.
   - (2) In patients with significant lens opacity precluding a view of the retina, it may not be possible to diagnose retinal pathology pre-operatively.
   - (3) If we detect or suspect significant other pathology, it is important that our patients are informed about the risk or probability of a poor outcome following surgery.
   - (4) It would be good to operate on eyes with no other pathology. However, cataract surgery often needs to be carried out on eyes that have significant other pathology and will have a poor outcome as a result. Ideally, we would like the secondary level district surgery centres to offer surgery for ‘ uncomplicated’ cataract (‘white blindness’) that is likely to have a good outcome. Patients with cataract who also have significant other pathology that is likely to result in a poor outcome (‘black blindness’) would best be referred to a tertiary centre for their surgery. District surgery centres would then develop a positive reputation for sight restoration for patients with white blindness’. This ‘blindness apathie’ — separating the cases of white blindness’ from the cases of ‘black blindness’ — should have a positive marketing impact on the uptake of the cataract surgical services in the district surgery centres.

2. Surgery
   - (1) Cataract surgeons working in our programmes should have opportunity for adequate supervised training. Whilst there will be considerable individual variation, a recommendation for the minimum requirements for training is 6 months and 100 uncomplicated, unassisted surgeries.
   - (2) Cataract surgeons should do the type of surgery that they are most comfortable with and most skilled to do.
   - (3) They should be adequately equipped with the instruments and consumables that they require.
   - (4) Most importantly, all surgeons should monitor the outcome of the surgery in all their patients. Whatever surgical technique they use, monitoring of the visual outcome of their surgery is guaranteed to improve the outcome of their surgery. This monitoring should be for each surgeon to compare ‘themselves with themselves’ over time. It should not be used to compare one surgeon with another or one institution with another. As individual surgeons, we have been concerned with the numbers (quantity) of our cataract surgery. We need to be equally concerned and also prioritise the outcome (quality) of our surgery.

3. Uncorrected Refractive Error
   - (1) The quality of aphakic vision corrected with aphakic glasses is inferior to that of pseudophakic vision corrected with an intraocular lens. Uncorrected aphakia from lost or broken aphakic glasses is an important cause of low vision or blindness following cataract surgery. The transition from intracapsular cataract extraction with aphakic spectacle correction to extracapsular cataract extraction with intraocular lens implantation has been and is a most significant factor in the improvement of the outcome of cataract surgery. Wherever possible, this transition should be encouraged.
   - (2) Whilst the implantation of a standard power intraocular lens is acceptable practice in some field situations, mismatches between implantation of a customised intraocular lens power will effect a further improvement in visual outcome.
   - (3) Most important, however, is good initial wound closure and the appropriate removal of sutures to reduce residual significant astigmatism and for spectacle correction of residual refractive error 8 weeks after surgery.

4. Post-operative Complications
   - (1) Wherever possible, careful post-operative follow-up with early detection and treatment of post-operative complications will allow a further improvement in outcome. Routine follow-up after 2 weeks and 8 weeks is recommended.
   - (2) An important cause of poor outcome is prolonged untreated post-operative inflammation. If post-operative follow-up is likely to be inadequate, consideration should be given to the administration of a subconjunctival depot steroid injection at the end of surgery.
   - (3) Posterior capsule opacification is an
Improving Outcomes

important cause of poor outcome following extracapsular cataract extraction. This risk can be minimised with careful and thorough cortical clean-up during surgery. Either surgical or YAG laser capsulotomy is required for those cases with visually significant posterior capsule opacification after 6 months.

(4) Late complications may include retinal detachment or the possible worsening of ‘incidental’ problems such as age-related macular degeneration and diabetic retinopathy.

Summary

1. Poor outcome may be due to ‘selection’ (other pathology), ‘surgery’ (intra-operative complications), ‘spectacles’ (uncorrected refractive error), or ‘sequelae’ (post-operative complications).

2. To improve the outcome of our cataract surgery the following should apply:

   Individual cataract surgeons must:
   - Monitor their intra-operative complications and the visual outcome of their surgery. This is good practice that is guaranteed to improve surgery results!

Programme managers must:
   - Facilitate a transition from intracapsular cataract extraction with aphakic spectacle correction to extracapsular cataract extraction with intraocular lens implantation
   - Ensure adequate training of cataract surgeons
   - Ensure the provision of adequate instrumentation and surgical consumables required
   - Ensure that all cataract surgeons are monitoring the outcome of their surgery.

Surgical Techniques for a Good Outcome in Cataract Surgery: Personal Perspectives

Ravi Thomas MD
Thomas Kuriakose
FRCS, DNB
Schell Eye Hospital (Christian Medical College)
Arni Road
Vellore 632001
India

The mandate of this article is to provide practical examples of how to achieve safe, good quality cataract surgery with different surgical techniques.

Cataract Outcomes and Case Selection

In India, increasing pressure to clear cataract backlogs has placed emphasis on number only. If outcomes and quality are ignored, we not only convert curable blindness to incurable but also create adverse publicity for our programme. Case selection is an important issue. In this context, it is important to appreciate that a torch light examination alone may not be sufficient to detect pre-existing pathology (e.g., glaucoma or macular degeneration) that can contribute to poor visual results. Signs, such as mild subluxation of the lens, detected on a slit lamp can result in a change of surgical plan from ECCE to ICCE.

Complications

Wound related problems, endothelial damage, vitreous loss and post-operative infections are the common factors that contribute to poor outcomes in any type of cataract surgery. Good surgical technique and appropriate management of complications can help minimise these.

Anaesthesia

A soft, well anaesthetised eye is vital to the success of intracapsular (ICCE) and standard extracapsular cataract surgery (ECCE). Use of hyaluronidase and intermittent digital pressure (released every 30 seconds) spreads the anaesthetic and reduces the vitreous volume for safe surgery. Though the modern small incision cataract surgery (both phacoemulsification and manual) can be performed under topical anaesthesia, peribulbar injections may be more suited for the average surgeon.

Lighting and Magnification

Good lighting and magnification improves visibility and is required even for ICCE. A good microscope fulfils these two requirements. Wound construction, recognition and management of problems like residual cortex, posterior capsule rupture, vitreous...
loss, etc, are all better dealt with using a good quality microscope.

Sterilization and Post-operative Infection

Commensal bacteria in and around the eye may be the cause of endophthalmitis. Cleaning the periorbital skin including the eyebrows and eyelids with povidone iodine will reduce the bacterial load. In order to increase contact time, this is done at the time of anaesthesia as well as prior to surgery. Povidone iodine skin preparation (Betadine) should be used as a 5% solution. Povidone iodine eye drops can have strengths of 2.5% or 1%. The skin preparation should also be covered with occlusive dressings. Instruments should only be sterilized in appropriate chemicals (see Ingrid Cox and Sue Stevens with references: pp. 40-41) and always thoroughly rinsed and flushed through with sterile water before use.

No-touch Technique

The ‘no-touch’ technique is effective in minimising contamination. In the no-touch technique both the surgeon and the assistant ensure that only tips of the instruments make contact with the eye and do not touch anything else.

Surgical Blades and Wound Size

Use of a sharp blade ensures a clean wound that will appose well. Being ‘poor mission hospital doctors in a poor developing country’ we re-sterilize and re-use expensive blades. However, beyond a certain number of ‘uses’, this is actually detrimental to the outcome. The money saved may not be worth it.

As far as the wound size is concerned, for ICCE and ECCE it is better to err on the side of a larger wound. For ICCE this helps in adequate retraction of the cornea for cryocoagulation and helps prevent capsular rupture. In the usual manual ECCE the larger wounds facilitates the nucleus expression; and excess pressure that can result in zonular dialysis or posterior capsular rupture is avoided.

Use of an Anterior Chamber Maintainer (ACM)

Maintaining a formed anterior chamber (AC) during surgery can minimise endothelial loss. This is usually achieved by the use of methyl cellulose, or air. We use an ACM. In our hands, the ACM (Fig. 1) is an excellent tool for use in small incision surgery, both manual and with phacoemulsification. It is usually introduced at the very beginning of surgery and has several advantages. The ACM keeps the anterior chamber deep during capsulotomy. It firms up the eye and facilitates the incision. All the flow is outwards; debris is washed out and contamination is decreased. Fluid lost from the eye is immediately replaced; turbulence is reduced and the IOP is maintained. Theoretically, the constant IOP should decrease the risk of expulsive haemorrhage. A well formed AC protects the endothelium and assists rotation of the nucleus where this is required. The fluid under pressure helps complete hydrodissection. In the manual small incision technique that we use, the ACM flow is also used to express the nucleus.

Cortex is safely aspirated through a paracentesis with a syringe attached to a cannula; this is done in a deep and stable anterior chamber provided by the ACM (Fig. 2). We use this technique for cortex aspiration even with phacoemulsification. In the event of vitreous loss, an ACM facilitates the vitrectomy. We believe in the ACM and strongly recommend its use routinely, as well as for teaching small incision surgery.

Vitreous Loss and Vitrectomy

Vitreous loss is the most common complication of cataract surgery; if not managed appropriately it can cause delayed and irreversible visual loss. We recommend a mechanical vitrector to manage this problem.

The objectives of a vitrectomy for vitreous loss are:
1. Avoid vitreous incarceration into the wound.
2. Avoid vitreous contact with other anterior chamber structures like the corneal endothelium and iris.

The height of the ACM is lowered and the vitrectomy. We believe in the ACM and strongly recommend its use.

The ACM keeps adequate capsular support for the IOL.

Wound Closure

As far as wound closure is concerned, it is the correct apposition and not the number of sutures that is important. Pre-placed marks across the line of the wound and using irregularities in the wound like a jigsaw puzzle help in proper apposition. Using the circular ring at the end of a safety pin as a simple per operative keratome and keeping a large air bubble in the AC while suturing prevents high astigmatism.

We hope this article has provided some practical guidelines that will help improve outcomes. We realise that we may have raised more questions than have been answered, but space constraints prevent detailed discussion of techniques.

Surgical Techniques

Fig. 2: Pre-operative picture showing the ACM fixed inferiorly and a single-port cannula being used through the upper paracentesis port to aspirate the last bit of cortex.

Photo: Ravi Thomas, Thomas Kuriakose

Bench top autoclave in use in Kenya

Photo: Kikuyu Eye Unit
Care of Ophthalmic Surgical Instruments

Ingrid Cox
RGN KRN COA ENB 176
Sister-in-Charge
Kikuyu Eye Unit
P O Box 1021
Kikuyu
Kenya

Sue Stevens
RGN RM OND FETC
Nurse Consultant
Journal of Community Eye Health
Ophthalmic Resource Coordinator
International Centre for Eye Health
Institute of Ophthalmology
11–43 Bath Street
London EC1V 9EL
UK

In Issue No 19 of the Journal of Community Eye Health the article STERILIZATION AND DISINFECTION reminded readers that: ‘... good surgical results are dependent upon sterile instruments, in good working order, used by skilled people ...’

This article gives an overview of the principles of surgical instrument care. Both subjects are covered more comprehensively in OPHTHALMIC OPERATING THEATRE PRACTICE: A Manual for Secondary and Tertiary Levels in Developing Countries. This publication will be available from ICEH early in 2001.

Handling of Ophthalmic Instruments

All ophthalmic instruments need particularly careful handling.

• Scissor points are extremely delicate; the tips should not be touched
• All scissors, needle holders and fine forceps need to have their tips protected. The protectors must cover the whole blade or jaws of the instrument
• Scalpel blades and knives must be passed to the surgeon by the handle with the cutting edge pointing downwards. Artery forceps must be used to remove the blade
• No instrument should ever be thrown down! Eye instruments are extremely delicate.

Caution is needed when disposing of needles and other sharp instruments (‘sharps’)

• Needles must be disposed of in the correct receptacle. During the operation, all sharps are kept in a glasspot on the instrument trolley and later disposed of safely; an old infusion bottle or any tough plastic receptacle can be used as a ‘sharps’ container. When the receptacle becomes two-thirds full it should be sealed with tape and incinerated
• Needle stick injuries are frequently caused by re-sheathing disposable needles. This is NOT recommended! These needles should be disposed of immediately after use in the receptacle provided
• Needle stick injuries must be reported immediately to the person in charge. There should be a hospital policy regarding needle stick injuries and this must be followed
• The chances of transmitting the AIDS virus with a needle prick are thought to be 1 in 1000, or higher, in some countries
• Never re-sterilize disposable needles.

Maintenance

Cleaning

Rain water or distilled water is preferred. If neither is available, freshly boiled tap water may be used.

The following method should be used after each operation.

Three containers are required:

Container 1: hot soapy water

• The instrument must be supported carefully whilst cleaning
• A soft toothbrush can be used to clean each instrument individually
• Needle holders, scissors and artery forceps must be completely opened to clean inside the jaws
• Cannulae must be flushed through. Lens matter, vitreous and visco-elastic gel block cannulae permanently
• Cotton wool should not be used to clean instruments as it damages the tips.

Container 2: lubricant

• A lubricant prevents the development of stiff joints and inhibits the development of corrosion
• Lubricant is needed for hinged instruments only, e.g., scissors, needle holders and artery forceps
• The instrument must be supported in the lubricant; they must NOT be soaked
• If a lubricant is not available, the instruments should be rinsed in clean hot water
• Do NOT put cannulae in lubricant.

Container 3: clean hot water

• Excess lubricant or soap is rinsed off and the instrument left in the open, disassembled position on a clean absorbent cloth
• Cannulae must be flushed through again to remove any soap debris.

Drying

• Instruments must be dried thoroughly before being stored. If the instruments are put away wet or damp they will rust
• A hair dryer is very effective for drying the joints and crevices of instruments. If a hair dryer is not available, dry gauze may be used cautiously
• Never force open a forceps even when drying, as this will distort the instrument.

Inspection

Before storing, all instruments should be carefully inspected, as follows:

• Hinged instruments should be checked for jaw alignment
• Micro-scissors should be able to cut through one thickness of surgical glove. The tips should be smooth and in alignment
• Dissecting forceps should meet at the tips and be aligned
• Grooved forceps, when held up to the light, should show a perfect circle at the tips. The forceps should be symmetrical
• Needle holder tips must meet allowing for the suture to be held well. There should be no gap between the jaws. The
needle holder should open and close smoothly
- Blades should retain a sharp, smooth edge
- Cannulae should be flushed with air to ensure patency and dryness.

**Corrosion and rust**

Corrosion and rust is caused by:
- Inadequate cleaning, rinsing and drying
- Using tap water
- A malfunctioning autoclave.

Most instruments are made from stainless steel. Stainless steel does not usually rust. However, it can corrode if it is washed in saline or left to soak for a long period of time in any liquid.

Once the instrument has started to rust it will become weak, and the rust will eventually destroy and break the instrument (metal fatigue).

Rust commonly occurs on chrome or nickel-plated instruments. When the plating wears off, the carbon steel is exposed and is further corroded by autoclaving and washing. If this occurs the instruments cannot be sterilized properly.

Inexpensive instruments tend to rust more easily as the stainless steel is of a poorer quality.

Sodium nitrate is an anti-rusting agent and can be used in conjunction with the lubricant or on its own. Two tablets can be dissolved in 500ml of water, when washing the instruments.

**Instrument stains**

Thorough inspection may reveal discoloration of the metal. Some stains can be rubbed off with a rubber eraser but it may leave a rough surface. Contact with hydrochloric acid and iodine should be avoided.

Instruments not rinsed thoroughly after chemical sterilization will stain. Manufacturer’s recommended soaking times must not be exceeded.

**Oiling**

With repeated sterilization, instruments will become stiff and difficult to open. A good quality sewing machine oil or silicone oil should be used each week on hinged instruments. This is especially relevant when working in a very hot, dry climate.

- Use a 2ml syringe and 21G needle to draw up the oil
- Change to a 25G needle, open the instrument and place a drop in the jaws; work in the oil by repeatedly opening and closing the instrument
- Wipe off any surplus oil with gauze.

Surplus oil on an instrument will inhibit sterilization. Using an instrument lubricant will help to maintain the action of the instrument but oiling is still necessary.

**Repairs**

Eventually scissors will need sharpening, forceps re-aligning, etc. Instrument companies will repair and re-sharpen instruments to a high standard but repairing instruments takes time. The cost of a good repair is much cheaper than buying a new instrument.

**STORAGE AND TRANSPORTATION**

**Shelving**

Glass shelving is preferred, as it is easy to keep clean. Ideally, instruments need to be in a dry, well ventilated, secured cupboard. A drying agent, e.g., silicone gel can be placed on the shelves to absorb moisture in the air.

- The instruments must be arranged in an orderly manner and labelled
- Protectors should be used when instruments are in storage
- Never pile instruments on top of each other!
- Micro-scissors work on a spring action and are kept in the open position until in use
- Needles and cannulae can be sterilized ready for use on a silicone mat or a thick piece of material.

**Instrument Trays**

Individual slots in the tray hold one instrument; this prevents the instruments touching. Trays are useful for transporting instruments, e.g., to outreach clinics and the sets are ready immediately for sterilization. Protectors must be used.

**Instrument Rolls**

This is a length of material with pockets to hold an individual instrument. The roll is tied with a piece of string to keep it secure. Instrument rolls are cheap, easy to make and are excellent for transportation purposes. Protectors must be used.

**Instrument Cases**

These cases are metal or plastic boxes containing a protective silicone mat which prevents the instruments touching during storage and sterilization.

**SECURITY**

Ophthalmic instruments are very expensive and delicate. It is therefore necessary to ensure a secure place to store the instruments when not in use.

- Storage shelves should be in a locked cupboard
- New members of theatre staff should be instructed carefully in the care and maintenance of theatre instruments
- A person of integrity should be made responsible for the care of instruments
- An inventory of all instruments should be carried out monthly to ensure that there are no discrepancies
- Any instrument that is faulty must be removed immediately from the theatre and sent for repair
- The operating theatre should be locked and windows shut when not in use.

**References**

The major goal of VISION 2020: The Right to Sight is to make high quality eye care services available, accessible and affordable to all, through a sustainable delivery system. One of the key pre-requisites is the development of adequate, appropriate human resources. An analysis of current practices reveals problems related to number, quality of training, distribution and utilisation of various categories of eye care personnel. Fundamentally, most eye care delivery services in developing countries lack appropriate human resource planning and, therefore, implementation of services is seriously affected.

Human resources are required for primary, secondary and tertiary levels of eye care, to provide the medical/technical, management/administrative and community eye health services. This is best carried out by an ‘eye care team’. Some of the services can best be achieved by integrating them into general health care systems in various communities.

For effective eye care delivery to underserved populations, we have evolved a comprehensive model covering initially a population of 500,000. Table 1 illustrates the human resource structure for these centres and the benefits of the team approach.

The team essentially comprises one ophthalmologist supported by optometrists, ophthalmic technicians and ophthalmic nurses, a biomedical and maintenance technician, a management group and a support services group.

All training is provided at the L V Prasad Eye Institute (LVPEI) or by its staff at the centre concerned. After training, close monitoring of the performance is maintained for two years by LVPEI. This model typically provides outpatient services to 12,000 to 15,000 outpatients, 1500 to 1700 intracocular surgical procedures, with about 60 percent absolutely free of cost. It further provides complete door-to-door screening of about 300,000 of the population with 90 to 100 percent community-based rehabilitation of the incurably blind, and better than 100 percent cost recovery by the third year. This output can be doubled by a subsequent 30 percent increase in staff over three years. This model demands the following:

- Close linkage with a training / tertiary care centre
- Linkage with the local community
- Good infrastructure
- High quality training of all personnel
- Prompt and high quality service.

All members of the staff, with the likely exception of the ophthalmologist, should be selected from the local community. The demand for different categories of personnel varies across regions. Unfortunately, there is a tremendous shortage of all eye care professionals globally, the problem being most acute for categories other than ophthalmologists. Most countries either have very poor or no infrastructure for such training, leading to a disproportionate higher number of ophthalmologists. In such circumstances, ophthalmologists perform tasks that do not require their level of training.

### Table 1: Human Resource Structure for a Centre Serving 500,000 in India

<table>
<thead>
<tr>
<th>Category</th>
<th>Number</th>
<th>Functions</th>
<th>Qualifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ophthalmologist</td>
<td>1</td>
<td>Medical and surgical care</td>
<td>Residency + comprehensive ophthalmology fellowship</td>
</tr>
<tr>
<td>Optometrists</td>
<td>2</td>
<td>Initial evaluation, refraction, tonometry, etc. and patient instruction</td>
<td>2-4 years training (post-class 12)</td>
</tr>
<tr>
<td>Ophthalmic Technicians</td>
<td>2-3</td>
<td>Community screening, CBR and linkage with primary health care</td>
<td>1-2 years training (post-class 12)</td>
</tr>
<tr>
<td>Ophthalmic Nurses</td>
<td>6</td>
<td>Operating rooms and inpatient wards</td>
<td>1 year training (post-class 10)</td>
</tr>
<tr>
<td>Management Group:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Administrator</td>
<td>1</td>
<td>Overall administration</td>
<td>1 year training (post-college degree)</td>
</tr>
<tr>
<td>Accounts / Stores</td>
<td>1</td>
<td>Accounts and inventory management</td>
<td>1 year training (post-class 12)</td>
</tr>
<tr>
<td>Medical Records</td>
<td>1</td>
<td>Maintenance of medical records</td>
<td>1 year training (post-class 12)</td>
</tr>
<tr>
<td>Patient Counsellors</td>
<td>3</td>
<td>Outpatient registration, inpatient and surgical counselling</td>
<td>1 year training (post-class 12)</td>
</tr>
<tr>
<td>Maintenance Technician</td>
<td>1</td>
<td>Repair and maintenance of equipment and building</td>
<td>1 year training (post-class 10; basic technical training)</td>
</tr>
<tr>
<td>Support Services</td>
<td>8-10</td>
<td>All support services as identified</td>
<td></td>
</tr>
</tbody>
</table>
In general, the following factors need attention for human resource development for eye care in most developing countries. Each of these 10 listed factors require further expansion and explanation – beyond the scope of this short article.

1. Development of a uniform ‘basic minimum’ curriculum for residency training of ophthalmologists.
2. A larger number of training programmes to enhance the skills of already qualified professionals. This will go a long way towards improving the quality of care. India is an example.
3. Design of an appropriate matrix of human resource requirement for the different systems of eye care delivery.
4. Pilot projects should be carried out to find a solution to the complicated issue of under-utilisation and unequal distribution of ophthalmologists.
5. Improve or develop an infrastructure of acceptable standards. Develop guidelines to ensure basic minimum standards.
6. Increase the availability and accessibility of educational materials. Many excellent resources are available such as those of the American Academy of Ophthalmology, which should be adapted globally with appropriate modifications. The International Resource Centre at the International Centre for Eye Health, London, provides teaching and educational materials, including this Journal. Six other resource centres are being developed over the next 3 years in India (LVPEI), Pakistan, Tanzania, South Africa, Nigeria and Colombia.
7. Development of a global network of training centres with exchange of knowledge through electronic conferences, discussions, consultations and educational materials.
8. Development of a large number of training programmes for all categories of eye care professionals.
9. Career advancement mechanisms should be explored and created for all categories of health care workers that will help stabilisation of the eye care workforce.
10. Institution of monitoring and evaluation mechanisms followed by implementation of recommendations.

The funding for these various programmes is a major issue which will need to be addressed by local and national health care authorities.

The aim ultimately should be to train an ophthalmic technician to provide a comprehensive eye care service through a (small) vision centre for each 50,000 population. This certainly demands a major effort to develop training programmes throughout the world.

VISION 2020: The Right to Sight is a plan to intensify global efforts to eliminate needless blindness. Human resource development is vital to the successful execution of this plan. The resources are available but the mechanisms to exploit them should be put in place.

Reference


High Quality Affordable Intraocular Lenses (IOLs)

High quality, affordable IOLs are available from the following manufacturers:

AUROLAB
All PMMA three piece posterior chamber (PC) and single piece posterior as well as anterior chamber (AC) IOLs are manufactured in compliance with international quality standards. Facility is ISO 9001 certified by Underriter Writers Laboratories Inc., USA.

Available in 5 to 30 dioptre range. Special lenses available on request include scleral fixation, low power and custom designed types.

Available from:
India: Aurolab
Aravind Eye Hospital
1 Anna Nagar
Madurai 625 020, India
Fax: + 91 452 535274
email: aurolab@aurolab.com
www: http://www.aurolab.com

THE FRED HOLLONS FOUNDATION
Single piece, PMMA posterior chamber IOLs manufactured in compliance with IS09002, EN46002 and CE Mark standards.
Available in 5.5mm and 6.0mm optic diameters and 8 to 30 dioptre range in 0.5 dioptre increments. A Constant of 118.3

Available from:
Eritrea: The Fred Hollons IOL Laboratory, PO Box 1078, Asmara, Eritrea. Fax: +291 1 122532
email: fhlab@eol.com.er

Nepal: The Fred Hollons IOL Laboratory, Tilganga Eye Centre, PO Box 561, Kathmandu, Nepal.
Fax: +977 1 474937
email: tilganga@mos.com.np

Australia: The Fred Hollons Foundation, Locked Bag 100, Rosebery NSW, 2018 Australia
Fax: +61 2 83382100
email: ffl@hollons.com.au

The Foundation supports organisations (not individuals) that work with the blind, including those with multiple disabilities. It also supports low vision, integrated education, vocational training and CBR projects as well as early intervention and improved medical treatment of eye diseases. Based on Christian principles, the Foundation supports organisations regardless of religion, nationality, race or age. For more information, please write a short letter introducing yourself and requesting an application questionnaire. For those with internet access, the questionnaire is also available on the website.

Foundation Dark & Light,
PO Box 672, 3900 AR Veenendaal, The Netherlands.
Tel:+31318561501
Fax:+31318561577
E-mail: darkandlight@compuserve.com
Website: www.darkandlight.org
The previous article in this series examined some important concepts related to ‘teaching’ and ‘learning’. In this article we take a short look at the role of communication in teaching. The article aims to make readers more aware of the importance of communication in teaching, and hopes to give some ideas of how readers can improve their own teaching practice.

Communication

What is ‘communication’? According to the Concise Oxford Dictionary the word means ‘the act of imparting, especially news’, or ‘the science and practice of transmitting information’. These definitions clearly show the link between ‘teaching’ and ‘communication’: teachers are constantly imparting new knowledge, or transmitting information.

Hubley has shown us that communication is a complex process (Fig. 1). At any stage of this process things may go wrong, making the communication less effective. For instance, the sender may not express what s/he wants to say clearly; or the room may be noisy; or the receiver may not understand the words the sender is using. To be effective, teachers have to try to minimise these barriers to communication.

We do this in a number of ways – for example, by making sure that the room is quiet and well lit; by speaking slowly and clearly; by only using words which the students should be able to understand. However, the most important way to overcome the barriers is two-way communication (Fig. 2). This means getting regular feedback from the receivers (the students in this case): are they really understanding what we are trying to put across?

Communication does not only take place by means of words; non-verbal communication (or body language) is equally important. We are all familiar with the different kinds of non-verbal communication (Fig. 3).
How can I know whether I am communicating well as a teacher? Communication is a skill – and we improve our skills by getting feedback on the way we perform them. We can get such feedback by asking an experienced colleague to sit in on our teaching, and to give us feedback. We can also ask someone to record us on a videotape as we teach, which we then inspect critically afterwards. In either case the feedback will be better if we use a checklist to judge our performance. Fig. 4 gives such a checklist.

Written Communication: Handouts

Teachers communicate by speaking, but also by writing. We have seen how we can improve the overhead projector transparency we use, if we write them carefully. The same is true of the handouts that almost all teachers prepare for their students.

What is a handout? It is not a photocopy of a journal article, or of some pages out of a textbook. Rather, it is a document which the teacher writes him/ herself. It may be a summary of important points to be learnt; or a guide to students on work they have to do, or references they have to look up. Teachers may use handouts for students to refer to during a lesson, and students will definitely use them in their self-study time. Because handouts are such an important way of communicating with students, they must communicate effectively. Fig. 5 provides a checklist which should help you to write better handouts.

These days many teaching institutions have websites where teachers put their handouts for the students to find. It doesn’t matter whether the handout is on paper or on a website - it still needs to be well written.

And Finally

All health workers need to communicate well, if they are to do their work well. Unfortunately, many are never taught how to do this. Teachers of health workers, therefore, also have to teach their students to be better communicators. We will learn more about this in the next article in this series.

Fig 4: Checklist for Communication During Teaching

About the style of presentation
- Does the teacher speak clearly?
  (loud enough; not too fast; faces the class; avoids mannerisms like ‘um’)
- Is the teacher’s non-verbal communication suitable?
  (appropriate gestures and expressions; moves around; eye contact with whole class)
- Does the teacher speak understandably?
  (uses words that the students should be able to understand)
- Is the speed of presentation right?
  (the students must be able to absorb the material that is presented)
- Is there two-way communication?
  (the teacher checks regularly if the students have understood)
- Is there evidence of a good relationship between teacher and students?
  (teacher and students respect each other; listen to each other)

About the content
- Does the teacher emphasise important knowledge?
  (the main messages are clear and emphasised; unnecessary detail is left out)
- Is information presented in a logical sequence?
  (bits of information follow logically after each other – easy to understand and remember)

About the place where the teaching is happening
- Is the place conducive to good communication?
  (enough light; noise from outside)
- Are the students comfortable?
  (adequate seating; students can see the teacher; not too hot/ too cold)

About the use of teaching aids
- Are the teaching aids relevant?
  (the aids only deal with the subject matter of the lesson, and clarify it)
- Are the teaching aids well prepared?
  (only contain highlights; points neat; different colours are used)
- Are the teaching aids easy to read and understand?
  (letters and pictures are large enough; not too much crammed onto one aid)
- Are the teaching aids skilfully used?
  (the teacher handles them with confidence; uses a pointer; does not mix them up)

Fig 5: Checklist for Writing Good Handouts

About the content
- Does it emphasize important knowledge?
  (makes clear what is important - the students don’t know)
- Does it present information in a logical sequence?
  (information logically connected, so it is easy to understand and to learn)
- Is it scientifically accurate and up-to-date?
  (information is true, comprehensive, in line with current thinking)

About the style of writing
- Are the sentences short? (not more than 20 words; one idea per sentence)
- Are active verbs used as much as possible?* (‘feed children regularly’, not ‘children should be regularly fed’)
- Are the readers likely to understand the words?
  (no jargon; using the simplest word that will say what you want to say)

About the layout/ presentation
- Is it legible/ easy to read? (handwriting neat; roneo copies or photocopies clear)
- Is it well spaced and not too full?
  (a page crammed full of print is discouraging, boring, difficult to read)
- Is it striking and interesting?
  (different letter sizes; bold font used for emphasis; pictures or diagrams included)

* thisistrueforEnglish – inotherlanguages thepassivevoice maybeclearandacceptable

References
Eye Injuries in Afghanistan

War Injuries in Northern Afghanistan

M Murtaza Farrahmand
MD MSc
Neamatullah Shams MD
M Karim Sharif MD DO
International Assistance Mission (IAM)
Mazar Ophthalmic Center (MOC)
Mazar City, Afghanistan

Introduction
Afghanistan in central Asia has experienced war for the last 2 decades, first following the Soviet invasion from 1979 to 1989, then civil wars between rival groups in the country. During 20 years of war in Afghanistan, different sorts of weapons have been used, and the fighting has produced millions of refugees. It has destroyed hospitals, schools, workplaces, individuals, and families. Afghanistan is one of the most severely mine-affected countries. Kabul, capital of Afghanistan, has been called the most heavily-mined city in the world.¹ Of 119 million active antipersonnel mines throughout the world it is said that Afghanistan has 8 to 10 million unmarked mines.² These mines are spread over 500 million square meters of irrigation land.³ Somewhere between 15% and 25% of the population is permanently disabled.⁴ About 50,000 Afghans have become amputees as a result of mine accidents. A landmine accident takes place every hour in this country.¹ Each mine costs about five dollars and, using current techniques of mine clearance, about US$1000 to remove. At the current rate of clearance it will take hundreds of years to make the whole of Afghanistan safe.²

The following prospective study was carried out at the Mazar Ophthalmic Center (MOC), the only ophthalmic center for northern and central Afghanistan (9 provinces) serving an estimated population of between 7 and 8 million.

Objectives
1. To determine the prevalence of visual impairment and blindness due to war eye trauma.
2. To determine the sex and age distribution of patients suffering war eye trauma.
3. To assess the outcomes of treatment of war eye trauma.

Methods
All patients who attended the outpatient department with ocular war injury were included in the study (6/12/1997 to 24/10/1998). A specific history was taken and each patient was examined using a Snellen chart, slit lamp biomicroscope and the indirect ophthalmoscope. Patients with minor injuries were treated as outpatients, with more serious cases admitted to the hospital. Surgery consisted of primary repair of corneo-scleral laceration and anterior segment reformation, as well as removal of anterior segment or scleral foreign bodies. There were no facilities for posterior segment surgery.

Results
Of 11,000 patients with different eye problems who attended the outpatient department, 116 patients (169 eyes) had war ocular trauma due to different weapons or military explosive material. Best (bilateral) visual acuities of those injured, at the time of presentation, are given in Table 1. Twelve persons (10.4%) were blind by WHO definition (<3/60 – NPL) and a further 20 (17.2%) were visually impaired (<6/18 – 3/60). Visual Acuities of war traumatized eyes are shown in Table 2. Eighty-nine persons (52.7%) were blind and a further 23 (13.6%) were visually impaired. Twenty-three eyes (13.6%) did not have visual acuity recorded. Table 3 gives the age distribution which was from 6 to 60 years (mean 33 years). Sex distribution of patients with war eye injuries was: 112 (96.6%) male and 4 (3.4%) female. Forty-eight (41.4%) patients themselves or their colleagues (mostly male children) had exploded military explosive material or were injured by misfired weapons (soldiers and militia personnel). The study found 20 (17.2%) with intraocular foreign bodies; 90% of patients had facial wounds and 43.9% other associated injuries (e.g., 2 persons with both hands amputated, 2 persons

Table 1: Best (Bilateral) Visual Acuity of War Traumatized People – At Presentation

<table>
<thead>
<tr>
<th>VA</th>
<th>No.</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>6/6–6/18</td>
<td>84</td>
<td>72.4</td>
</tr>
<tr>
<td>&lt;6/18–6/60</td>
<td>15</td>
<td>12.9</td>
</tr>
<tr>
<td>&lt;6/60–3/60</td>
<td>5</td>
<td>4.3</td>
</tr>
<tr>
<td>&lt;3/60–NPL</td>
<td>12</td>
<td>10.4</td>
</tr>
<tr>
<td>Total</td>
<td>116</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Table 2: Visual Acuity of Eyes with War Injuries – At Presentation

<table>
<thead>
<tr>
<th>VA</th>
<th>No.</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>6/6–6/18</td>
<td>34</td>
<td>20.1</td>
</tr>
<tr>
<td>&lt;6/18–6/60</td>
<td>17</td>
<td>10.0</td>
</tr>
<tr>
<td>&lt;6/60–3/60</td>
<td>6</td>
<td>3.6</td>
</tr>
<tr>
<td>&lt;3/60–NPL</td>
<td>89</td>
<td>52.7</td>
</tr>
<tr>
<td>Not Recorded*</td>
<td>23</td>
<td>13.6</td>
</tr>
<tr>
<td>Total</td>
<td>169</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Table 3: Age Distribution of Patients with War Eye Injuries

<table>
<thead>
<tr>
<th>Age</th>
<th>No.</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>0–10</td>
<td>14</td>
<td>12.1</td>
</tr>
<tr>
<td>11–20</td>
<td>44</td>
<td>37.0</td>
</tr>
<tr>
<td>21–30</td>
<td>41</td>
<td>35.4</td>
</tr>
<tr>
<td>31–40</td>
<td>12</td>
<td>10.3</td>
</tr>
<tr>
<td>41–50</td>
<td>2</td>
<td>1.7</td>
</tr>
<tr>
<td>51–60</td>
<td>3</td>
<td>2.6</td>
</tr>
<tr>
<td>Total</td>
<td>116</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Table 4: Visual Outcomes of Eyes after War Injury – At One Week after Injury

<table>
<thead>
<tr>
<th>VA</th>
<th>No.</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>6/6–6/18</td>
<td>23</td>
<td>13.6</td>
</tr>
<tr>
<td>&lt;6/18–6/60</td>
<td>9</td>
<td>5.3</td>
</tr>
<tr>
<td>&lt;6/60–3/60</td>
<td>3</td>
<td>1.8</td>
</tr>
<tr>
<td>&lt;3/60–NLP</td>
<td>36</td>
<td>22.3</td>
</tr>
<tr>
<td>Not Recorded*</td>
<td>98</td>
<td>58.0</td>
</tr>
<tr>
<td>Total</td>
<td>169</td>
<td>100.0</td>
</tr>
</tbody>
</table>

*Because of the critical condition of the patients the VA was not recorded.

*The patients have not returned for examination.
Eye Injuries in Afghanistan

with one hand amputated, 2 persons with one foot amputated and chest and abdomen injuries). Twenty-three eyes (13.6%) were eviscerated. Four eyes (2.4%) were given an implanted IOL. Sixty-one patients (98 eyes: 58%) did not return for check-up.

Discussion

The figures show that war injuries represent 1.0% of all people with eye problems who attended the eye hospital and that war injury is a major public health problem in Afghanistan. In contrast to civil eye trauma, which is usually unilateral, in war eye trauma the victim is prone to injuries affecting both eyes (45.7% in this study) and bilateral blindness (visual acuity <3/60: 10.4% in this study). War eye injuries were found more often among males in all age groups and is most common in the age groups between 11 and 30 years. More than half the patients (52.6%) have not returned for check-up. A number of factors influence the final outcome for the war-injured eye(s).

1. The severity of the initial lesion, particularly in open-eye injuries.
2. The quality of first aid and the definitive eye care.
3. The time since injury, the distance travelled and essential eye care all influence the outcome. Transport difficulties, lack of near eye care services, and the critical general health condition of many injured patients, require some time with the orthopaedic surgeon and the general surgeon. Relatives of the injured consult the ophthalmologist very late.
4. Poor general health status and the psychological status of the injured (e.g., amputation of hand(s) or leg(s) or death of family member(s)).

Recommendations

1. In the short term, clear marking of the areas which have been mined should be carried out, and avoidance of areas known to be mined. Government and concerned international organisations should organise awareness campaigns about mines and explosive materials for the general public.
2. In the long term, international organisations should help Afghan people to remove 7–8% of the world’s unmarked mines, thus preventing more casualties and disabilities. Agricultural production could increase by 88–200% in different regions of Afghanistan.6

Acknowledgments

This article has been kindly reviewed and assisted by Dr M Babar Qureshi MBBS DOMS MSc, Pakistan Institute of Community Ophthalmology (PICO). We also gratefully acknowledge the cooperation of our beloved colleagues Dr A. Zia Aamoon, Dr Kamran Aazar, Dr Safari Khair, Dr Manizha and Mr M Aref Hairat.

References

First Meeting of the World’s Patient-based Glaucoma Associations

The International Glaucoma Association (IGA) is currently undertaking a unique project to build relationships with glaucoma groups worldwide. This work will culminate in an International Assembly of glaucoma organisations. The Assembly will run over 4 days from 8th–11th February 2001.

Through the notice in the last edition of this journal and by other means, the IGA has built up many new contacts with glaucoma organisations and now has a potential delegate list of glaucoma organisations and professionals in over 40 countries. If you would like to be included in this ground-breaking event, contact:

Laura Gates
IGA Public Relations Officer
Tel: 0844 (0) 207 737 3265
E-mail: lgates@iga.org.uk

David Wright MSAE
Chief Executive, IGA