## *Abstracts of Asian research published in the international literature*

### Micro Syndrome in Muslim Pakistan Children

To date, micro syndrome has been reported in only 3 children from 1 family. Ainsworth et al describe an additional 14 children from 11 families in a retrospective case series of children attending 1 of 5 British hospitals. The following features were documented: pre- and postoperative eye findings, electrophysiological analysis, systemic abnormalities, development, neuroimaging, genealogy, and geographic origin of the family.

The eye findings of microphakia, microphthalmos, characteristic lens opacity, and atonic pupils were the presenting feature for all infants and were the most reliable diagnostic signs in the immediate postnatal period. Cortical visual impairment, microcephaly, and developmental delay were not always initially detectable, although they developed in all children by the age of 6 months. Microgenitalia was a useful diagnostic clue for affected males. Eye features were more consistently useful in determining diagnosis than dysmorphology or brain imaging. The families of all the children originated from the Muslim population of Northern Pakistan and inheritance is likely to be autosomal recessive.

Micro syndrome usually presents to the ophthalmologist, who may be able to make the diagnosis on the basis of characteristic eye findings combined with ethnic origin. Initially, the nature and severity of nonophthalmic features are not apparent. Early diagnosis of the underlying condition is important to guide the management of cataracts, glaucoma, and developmental delay. It is helpful for the family and medical staff to be aware of the low level of vision that develops despite optimal ophthalmic intervention. Genetic counselling extending into the wider family is particularly important in view of the high rate of consanguinity.

Ainsworth JR, Morton JE, Good P, *et al*. Micro syndrome in Muslim Pakistan children. *Ophthalmology* 2001;**108**:491-497.

### Blindness in Andhra Pradesh, India

A population-based epidemiology study was performed to determine the current prevalence and causes of blindness in the Indian state of Andhra Pradesh and to assess whether blindness has decreased since the last survey, performed in 1986 to 1989. The study used a stratified, random, cluster, systematic sampling strategy. Participants of all ages (n = 10,293), from 94 clusters in 1 urban and 3 rural areas, representative of the population of Andhra Pradesh, underwent interview and a detailed ocular evaluation by trained professionals. Blindness was defined as presenting with distance visual acuity of < 6/60 or central visual field of < 20° in the better eye.

275 participants were blind, a prevalence of 1.84% (95% confidence interval, 1.49 to 2.19%) when adjusted for the age, sex, and urban-rural distribution of the population. The causes of blindness were easily treatable for 60.3% (cataract, 44%; refractive error, 16.3%). Preventable corneal disease, glaucoma, complications of cataract surgery, and amblyopia caused 19% of the blindness. Blindness was more likely with increasing age and decreasing socioeconomic status, and in female subjects and in rural areas. Among the 76 million population of Andhra Pradesh, 714,400 are estimated to have cataract-related blindness and 228,000 refractive error-related blindness (Table 1).

If 95% of the cataract and refractive error blindness in Andhra Pradesh had been treated effectively, 3.4 and 7.4 million blind person-years, respectively, could have been prevented. If 90% of the blindness due to preventable corneal disease and glaucoma had been prevented, a further 2.7 million blind person-years could have been prevented.

The prevalence of blindness in this Indian state has increased from 1.5% in the late 1980s to 1.84% currently, despite the target of the National Program for Control of Blindness to reduce the prevalence to 0.3% by 2000. The number of people with cataract-related blindness has not reduced even with the eye care policy focus on cataract. Reduction of blindness in India will require strategies that are more effective than those that have so far been pursued.

Dandona L, Dandona R, Srinivas M, *et al*. Blindness in the Indian state of Andhra Pradesh. *Invest Ophthalmol Vis Sci* 2001;**42**:908-916.

**Table 1. Estimation of cataract-related and refractive error-related blindness in Andhra Pradesh.**

| | Number of people |
|---|---|
| **Cataract-related blindness** | |
| Cataract | 615,600 |
| Cataract surgery-related complications | 53,200 |
| Aphakia | 45,600 |
| **Refractive error-related blindness** | |
| Myopia | 159,600 |
| Hyperopia | 22,800 |
| Refractive error-related amblyopia | 45,600 |

## Acute Primary Angle Closure — Intraocular Pressure in Asian Eyes

The long-term outcome of intraocular pressure (IOP) after laser peripheral iridotomy in Asian eyes with acute primary angle closure has been reported in a retrospective study of 111 eyes of 96 consecutive patients attending the National University Hospital, Singapore between 1990 and 1994. The presenting features of the affected eye and the treatment instituted were recorded. The subsequent long-term IOP outcome was analysed. An increase in IOP at follow-up was defined as an increase in IOP to > 21 mm Hg and requiring treatment by medication or surgery.

The mean follow-up period was 50.3 months (range, 9.0 to 107.0 months). The mean presenting IOP was 52.8 mm Hg (range, 28.0 to 80.0 mm Hg). 110 eyes were treated with laser peripheral iridotomy, with resolution of the acute episode and IOP < 21 mm Hg for all eyes after treatment. Of these, only 46 eyes (41.8%) were successfully treated with laser peripheral iridotomy alone in the long term. Sixty four eyes (58.1%) developed an increase in IOP (requiring treatment) at follow-up, of which 49 eyes developed an increase in IOP within the first 6 months after acute primary angle closure. Thirty six eyes (32.7%) eventually underwent trabeculectomy because of uncontrolled IOP despite laser and medical therapy.

In this study of Asian eyes, a high proportion of eyes with acute primary angle-closure (58.1%) developed an increase in IOP during long-term follow-up after resolution of the acute attack, despite the presence of a patent laser peripheral iridotomy. These results suggest a racial difference in the outcome of laser peripheral iridotomy after acute primary angle closure in Asians compared with Caucasians. Since the majority of eyes that develop an increase in IOP do so within the first 6 months of presentation, close monitoring of IOP is advised for the follow-up of patients with acute primary angle closure.

Aung T, Ang LP, Chan SP, Chew PT. Acute primary angle-closure: long-term intraocular pressure outcome in Asian eyes. *Am J Ophthalmol* 2001;**131**:7-12.

## Cataract Extraction Among Chinese, Malays, and Indians in Singapore

A population-based incidence study was performed to describe the rates of cataract extraction among Chinese, Malays, and Indians in Singapore, an urban population in Asia. Data from all cataract operations performed for senile cataract between 1991 and 1996 were retrieved. The Singapore census was used as a denominator to allow an estimation of age, sex, and race-specific annual rates of cataract surgery.

61,210 cataract operations for senile cataract were performed between 1991 and 1996, which is equivalent to an average rate of 356.4 cataract operations per 100,000 persons per year (95% confidence interval [CI], 353.6 to 359.2). The average rate was highest for Indians, followed by Chinese, and lowest for Malays (Table 1). Women had higher rates of cataract extraction than men (age-adjusted relative risk, 1.14; 95% CI, 1.11 to 1.17), with this pattern consistent across the 3 racial groups. The rate of cataract extraction increased by an average of 40 operations per 100,000 per year (95% CI, 28.6 to 52.8) between 1991 and 1996. Overall, the proportion of cataract extraction without concurrent intraocular lens implantation was low (n = 762; 1.2%), but rates still decreased by an average of 0.8 per 100,000 per year (95% CI, 0.03 to 1.5) during the 6 years.

**Table 1. Age- and sex-adjusted rates of cataract extraction among different racial groups in Singapore.**

| Racial group | Rate per 100 000 per year |
|---|---|
| Indian | 396.5 |
| Chinese | 371.2 |
| Malaysian | 237.2 |

The rate of cataract extraction in Singapore is consistent with rates seen in developed countries in the West. Racial variation in rates suggests varying predisposition to cataract development and/or threshold for cataract surgery between Chinese, Malay, and Indian populations in Singapore.

Wong TY. Cataract extraction rates among Chinese, Malays, and Indians in Singapore: a population-based analysis. *Arch Ophthalmol* 2001;**119**:727-732.



## Central Vision Impairment, Blindness, and Cataract Surgery in Rajasthan

A population-based, cross-sectional study was performed to assess the prevalence of central vision blindness and cataract surgery in older adults in rural Northwest India. A random selection of village-based clusters was used to identify a population sample in the predominantly rural Bharatpur district of Rajasthan. Eligible subjects in the 25 selected clusters were enumerated through a door-to-door household survey and invited to village sites for visual acuity testing and eye examination early in 1999. A total of 4284 people aged 50 years or older were examined.

The prevalences of presenting and best-corrected visual acuity worse than 6/60 in both eyes were 11.9% (95% confidence interval [CI], 10.0 to13.9%) and 6.1% (95% CI, 4.7 to 7.4%), respectively. Presenting blindness was associated with increasing age, female gender, lack of schooling, and rural residence. Cataract was the principal cause of blindness in one or both eyes for 67.5% of blind people, with uncorrected

aphakia and other refractive errors in at least one eye affecting 18.4%. The prevalence of cataract surgery was 12.8% (95% CI, 11.6 to 14.0%), with an estimated 65.7% of the cataract blind having undergone surgery — low surgical coverage was associated with lack of education.

Blindness, particularly blindness due to cataract, continues to be a significant problem among elderly people living in remote areas of rural Northwest India. Increased attention should be given to reaching women and illiterate people.

Murthy GV, Gupta S, Ellwein LB, *et al*. A population-based eye survey of older adults in a rural district of Rajasthan: I. Central vision impairment, blindness, and cataract surgery. *Ophthalmology* 2001;**108**:679-685.



## Cataracts in Chinese Singaporeans

An epidemiological survey of cataracts and examination of the characteristics of lens opacities in Chinese Singaporeans was performed and the results compared with those from 2 similar surveys in Japan. 468 people aged 50 years or older, who responded to the invitation to participate, were examined. Examination included photo-documentation of the anterior and posterior segments of both eyes. Evaluation and grading of lens opacities were done using Scheimpflug graphical analysis and retro-illumination images. Inter-group comparisons were based on statistical analysis of cataract prevalence and distribution.

The prevalence of clear lenses decreased with ageing with no significant difference between males and females — a finding common to Singapore and the 2 Japanese study groups. The prevalence of cataracts (or lens opacities of ≥ grade II) in 60- to 79-year-old Singapore people was significantly higher than for Japanese people in the same age group. Further, cortical opacity was the main type in Singapore people aged 50 to 59 years and was significantly higher than that of Japanese people in the same age group. The distribution and prevalence of both nuclear and subcapsular cataracts among Singapore people were higher than in the 2 Japanese studies for all age groups.

Cataracts in Chinese Singaporean people are characterised by a high prevalence of nuclear opacities, which are generally seen in tropical and sub-tropical countries. This study also suggested the involvement of solar-UV in cortical cataracts as well as additional risk factors such as environmental temperature and race in nuclear and subcapsular cataract formation.

Sasaki H, Shui YB, Kojima M, *et al*. Characteristics of cataracts in the Chinese Singaporean. *J Epidemiol* 2001;**11**:16-23.

## Penetrating Keratoplasty in Taiwan

A retrospective chart review of the hospital records of all patients undergoing penetrating keratoplasty at the National Taiwan University Hospital from 1987 to 1999 was performed to determine the leading indications for penetrating keratoplasty and to identify changing trends in these indications. When possible, the clinical indication was corroborated by the pathological report. 770 corneal transplants were performed.

The leading indications for penetrating keratoplasty are shown in Table 1. A trend of increasing frequency of regraft and acute necrotising and ulcerative keratitis, a decreasing frequency of corneal scar, and an initially decreasing then increasing frequency of pseudophakic and aphakic bullous keratopathy were found during the study period. Acute necrotising and ulcerative keratitis was found to be the most frequent indication for regraft. Corneal scars, regraft, and acute necrotising and ulcerative keratitis were the leading indications for penetrating keratoplasty. A changing incidence of pseudophakic and aphakic bullous keratopathy noted during the study period was related to the type of intraocular lens implanted and the method of cataract surgery performed. This study found a comparatively high frequency of acute necrotising and ulcerative keratitis and an extremely low frequency of keratoconus compared with previous reports.

Chen WL, Hu FR, Wang IJ. Changing indications for penetrating keratoplasty in Taiwan from 1987 to 1999. *Cornea* 2001;**20**:141-144.

## Human Corneal Endothelium in South Asians with Cataract

A study was performed to describe the differences of corneal endothelial cell densities, cell size variability, and cell hexagonality in cataract populations of South Asia, between sexes and ethnic groups. 1235 eyes of 1235 male and female patients aged 40 to 75 years with senile cataract were examined with non-contact specular microscopy using a semi-automated analysis technique. The cell data of the study population was analysed in relation to age, sex, and ethnic group. Mean arithmetic differences and the coefficient of variation of repeated observations were calculated to estimate

**Table 1. Indications for penetrating keratoplasty in Taiwan.**

| Indication | Percent of patients |
|---|---|
| Corneal scars | 27.9 |
| Regraft | 21.0 |
| Acute necrotising and ulcerative keratitis | 17.9 |
| Pseudophakic or aphakic bullous keratopathy | 17.6 |
| Fuchs' dystrophy | 4.5 |
| Keratoconus | 2.5 |

precision of the technique. The main outcome measures were corneal endothelial cell density, cell size variability, and cell hexagonality. The mean corneal endothelial cell density was 2720 cells/mm$^2$, mean cell size variability was 37.8% and percent cell hexagonality was 40%. A statistically significant difference was found between the 3 ethnic populations in all the corneal endothelial cell measurements ($p < 0.0001$). Females had a 2.9% greater cell density than males ($p = 0.0001$). There was no significant difference in mean cell density according to age. Variability of cell size, however, increased with age ($p < 0.001$). These findings were consistent across the 3 ethnic groups. In a total sample of 1235 eyes distributed evenly among 3 cataract patient populations of south Asia, there were statistically significant differences of corneal endothelial cell densities of cell size variability and cell hexagonality between sexes and ethnic groups.

Snellingen T, Rao GN, Shrestha JK, *et al*. Quantitative and morphological characteristics of the human corneal endothelium in relation to age, gender, and ethnicity in cataract populations of South Asia. *Cornea* 2001;**20**:55-58.

## Epidemiology of Ocular Trauma in Singapore

A prospective survey of all patients seen at the ophthalmic unit at the Singapore General Hospital's emergency service from August to October 1997 was conducted to describe the epidemiology of ocular trauma from the perspective of the emergency service of a large tertiary hospital. Data on clinical presentation, type and cause of injury, and use of eye protective devices (EPD) were collected via a standardised interview and examination.

870 of 1631 patients seen during the study period presented with a diagnosis of ocular trauma. Compared with non-trauma patients, trauma patients were more likely to be male (odds ratio [OR], 4.2; 95% confidence interval [CI], 3.2, 5.4), non-residents (OR, 6.2; 95% CI; 3.7, 10.5), younger than 40 years (OR, 3.2; 95% CI, 2.7, 4.1), and less likely to require follow-up or hospital admission (OR, 0.2; 95% CI, 0.2, 0.3). The 3 most common types of injuries were superficial foreign body (58.2%), corneal abrasion (24.9%), and blunt trauma (12.6%), while open globe injury occurred in only 17 patients (2%). Comparison with a 10% random sample of all patients seen in the previous 9 months ($n = 284$) revealed no significant time variation in the types of injuries. Work-related injuries accounted for 590 patients (71.4%), where grinding, cutting metal, and drilling were the specific activities for more than 90% of the injuries. In appropriate settings, only 21.7% of patients with work-related injuries used EPDs, 43.7% were provided with EPDs, but did not use them at the time of injury, and the remaining 34.6% reported that EPDs were not provided.

Ocular trauma at the emergency service level in Singapore involves mainly young non-resident men with work-related injuries, associated with well-defined activities, and were generally minor. The low prevalence of EPD use reinforces the need for a review of the design and implementation of occupational eye safety programmes, especially among non-resident workers.

Voon LW, See J, Wong TY. The epidemiology of ocular trauma in Singapore: perspective from the emergency service of a large tertiary hospital. *Eye* 2001;**15**(Pt 1):75-81.

## Prevention of Corneal Ulceration in Nepal

A study was conducted to determine the incidence of ocular trauma and corneal ulceration in the district of Bhaktapur in Kathmandu Valley, and to determine whether topical antibiotic prophylaxis would prevent the development of ulceration after corneal abrasion. A defined population of 34,902 individuals was prospectively followed up for 2 years by 81 primary eye care workers who referred all patients with ocular trauma and/or infection to 1 of the 3 local secondary eye study centres in Bhaktapur for examination, treatment, and follow-up by an ophthalmologist. Individuals with corneal abrasion confirmed by clinical examination who presented within 48 hours of the injury without signs of corneal infection were enrolled in the study and treated with 1% chloramphenicol ophthalmic ointment to the injured eye 3 times a day for 3 days.

During the 2 year period, 1248 cases of ocular trauma (1788/100,000 annual incidence) and 551 cases of corneal abrasion (789/100,000 annual incidence) were reported. The number of clinically documented corneal ulcers was 558 (799/100,000 annual incidence). Of the 442 eligible patients with corneal abrasion enrolled in the prophylaxis study, 424 (96%) healed without infection, and none of the 284 patients who were given treatment within 18 hours after the injury developed ulcers. Four of the 109 patients (3.7%) who presented 18 to 24 hours after injury developed infections, and 14 (28.6%) of the 49 patients who presented 24 to 48 hours subsequently developed corneal ulceration.

Ocular trauma and corneal ulceration are serious public health problems that occur in epidemic proportions in Nepal. This study conclusively shows that post-traumatic corneal ulceration can be prevented by timely topical application of 1% chloramphenicol ophthalmic ointment to the eyes of individuals who have suffered a corneal abrasion in a rural setting. Maximum benefit is obtained if prophylaxis is started within 18 hours after injury.

Upadhyay MP, Karmacharya PC, Koirala S, *et al*. The Bhaktapur eye study: ocular trauma and antibiotic prophylaxis for the prevention of corneal ulceration in Nepal. *Br J Ophthalmol* 2001;**85**(4):388-392.