CHANGING PATTERN OF BLINDNESS IN SINGAPORE*

By R. C. K. Loh, A.M., F.R.C.S., F.A.C.S., D.O.
(Head of Ophthalmic Department, General Hospital, Singapore)

Sight is one of man's most valuable possessions. Partial or total blindness will always be a tragic state and although it can partly mitigated by training which enables the blind to become useful members of society, a greater part of the world's blind still have to suffer an additional distress of being a burden on the family and community.

Yet more than half of the world's blindness is preventable. With proper treatment by drugs and surgery, many of the blind today would not be in the pitiable stage that they are in, and many more would have some sight restored to them.

A Comparative Study of Blindness Prior to 1964 to the Period between 1964 and April, 1968

A previous analysis made by the Department of Ophthalmology in the General Hospital, Singapore in 1963 of blindness in Singapore showed that of nearly 1,200 cases registered blind, about 10% were born blind and about 90% acquired their blindness (Table I). Since then the register has increased to 1,300 cases, although in actual fact some 401 cases have been added since 1963, and nearly 300 cases have been removed because of death.

TABLE I

PREVIOUS ANALYSIS—1963
(1,200 CASES)

Those Born Blind	— approximately 10%
Acquired Blindness	— approximately 90%

Of those born blind, the commonest causes were:—

(i) Maldeveloped eye
(ii) Congenital Cataract
(iii) Degeneration of the Optic Nerve (Optic Atrophy)
(iv) Congenital Glaucoma

Retinoblastoma (a tumour of the retina of embryonic origin) was a relatively minor cause of blindness. Most of the bilateral retinoblastomas did not survive. In a majority of cases, retinoblastoma was seen only in one eye (Table II).

Of those who acquired blindness, the causes in order of frequency were found to be:—

1. Optic Atrophy (degeneration of Optic Nerve) 25%
2. Glaucoma 20%
3. Corneal Conditions nearly 20%
4. Intra-ocular Inflammations (Uveitis and Endophthalmitis) approx. 15%

Other common causes were:
(i) Trauma
(ii) Retinal Degeneration
(iii) Myopia
(iv) Cataract

TABLE II

CAUSES OF BLINDNESS SURVEY—1963

A. Those Born Blind:
Commonest Causes:
1. Maldeveloped Eye
2. Cataract
3. Optic Atrophy
4. Glaucoma

B. Acquired Blindness:
Commonest Causes:
1. Optic Atrophy 25%
2. Glaucoma 20%
3. Corneal Conditions 20%
Chief causes being:
(i) Trachoma 30%
(ii) Pyogenic Corneal Ulcers 20%
(iii) Keratomalacia 15%
(iv) Trauma and others
4. Intra-ocular Inflammations: Uveitis and Endophthalmia—approx. 15%

Other Commoner Causes were:
(i) Trauma
(ii) Retinal Degeneration
(iii) Myopia
(iv) Cataract

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A further study of the different causes of acquired blindness showed that in those that had corneal blindness, Trachoma was the chief culprit in some 30% of cases. Pyogenic Ulcers resulted in 20% of corneal blindness whilst Keratomalacia 15% and trauma and others the rest. One interesting point about trachoma was that the blind trachomatous patient occurred in the over 40 age group and very largely in the 56 and above age group. A further examination of these, revealed that in all cases those involved were immigrants from China and India. None of the cases registered blind from trachoma was born in Singapore. There was a relatively low incidence in the Malay population. Another feature of corneal blindness was the fact that Xerophthalmia (Keratomalacia) which is due to Vitamin A deficiency, was a decreasing influence as a cause of blindness. Keratomalacia was found associated with poor nutrition, bad nutritive habits and definitely in conjunction with poor economic groups. It also gave rise to blindness in the toddlers (aged 1-5) more so than in any other age group and as far as the incidence was concerned, it almost always occurred in childhood.

A follow up study in a more detailed way was done in cases newly registered during the years 1964, 1965, 1966, 1967 and part of 1968 (up till April), and as for Congenital Blindness a further study was made of the years 1960-1966 (inclusive) (Table III).

TABLE III

CONGENITAL BLINDNESS—1960-1966 (INCLUSIVE)—54 CASES

Causes	Number	Percentage
1. Maldevelopment	15	28%
2. Cataract	15	28%
3. Glaucoma	7	13%
4. Optic Atrophy	4	7%
5. Others	13	24%

Maldeveloped eyes (micro-corneae, micro-ophthalmos, anterior chamber dysgenesis, and phthisis etc.) and congenital cataracts are most commonly seen. Nearly 25% of these congenital cataracts had a history of rubella in the mother during pregnancy. Congenital Glaucoma (5 primary, 2 associated with aniridia, and 1 secondary) comes next and then Optic Atrophy. There is essentially very little change with the exception of Glaucoma showing a preponderance over optic atrophy.

A further study of 58 cases occurring between 1964 and April 1968 shows that 14.5% of cases of blindness are due to congenital causes. This is an increase over the past. This is not unexpected as efforts directed at removing or lowering the incidence of acquired blindness have succeeded in their objective to some degree.

Nystagmus is another fairly frequent cause (there was a family of four with it). Except for this family of nystagmus, there is no evidence of any other family with some form of congenital visual disability.

ACQUIRED BLINDNESS

343 cases of acquired blindness were added to the register since January 1964 up to April 1968 and these were studied and analysed (Table IV).

Table V gives the analysis of the more important causes of blindness in relation to each other.

A comparison of these figures with those of previous years reveal some significant differences. At an initial glance one point stands out quite clearly and that is Primary Acquired Glaucoma has replaced Optic Atrophy as the most important cause of blindness. Another important point is the increasing evidence that degenerative diseases of the Retina are more frequently found and that corneal causes of blindness have been reduced considerably in number.

A closer study is now worthwhile.

GLAUCOMA

Primary Glaucoma caused an average of 25% of blindness in the last four years and it has been increasing during the last few years.

1964	—	21.9%
1965	—	24.7%
1966	—	26.3%

Of these, Closed Angle Glaucoma is two times as frequent a cause of blindness as Open Angle Glaucoma. This is quite different compared with the better developed countries in the West. The frequency of incidence of closed angle glaucoma compared to open angle glaucoma is 4.5 times as common as far as our hospital figures are concerned. That closed angle glaucoma should be two times as common as a cause of blindness can be explained by the fact that the average

TABLE IV

ANALYSIS OF IMPORTANT CAUSES OF BLINDNESS

Year	Total No.	Glaucoma			Optic Atrophy			Retinal Degeneration			Cornea			Congenital		
		A	B	C	A	B	C	A	B	C	A	B	C	A	B	C
1964	91	—	5	14	—	13	5	—	5	5	3	7	—	4	—	—
1965	105	—	7	19	2	12	14	—	4	7	2	4	8	10	8	—
1966	91	—	4	17	5	11	5	—	8	6	2	3	2	7	6	—
1967	89	—	7	15	—	11	5	—	8	4	2	2	2	12	—	—
1968 (April)	25	—	2	5	—	3	—	—	3	—	—	—	—	4	—	—
	401	—	25	70	7	50	29	—	28	22	9	16	12	37	14	—

Note: A dash is left against the cause where less than 2 in numbers are seen.

Table IV gives a breakdown of the more common causes and the age groups in which they are found. (Age Group A=0-15 years of age, Group B=16-55 years of age, and Group C=greater than 56 years of age).

TABLE V

FURTHER ANALYSIS OF IMPORTANT CAUSES OF BLINDNESS (1964 - APRIL 1968)

Causes	Number	Percentage of Total (401)
1. Congenital	58	14.5%
2. Glaucoma (Acquired)	99	25.0%
3. Optic Atrophy	94	23.5%
4. Retinal Degeneration:		
(More in above 56 years age group) { Myopia, Detached Retina, Senile Macula Degeneration, Diabetes }	59	14.5%
5. Corneal Disease	38	9.5%
6. Others	53	13.0%
TOTAL	401	100.0%

person in the street tends to be tardy in seeking treatment either through sheer neglect or dislike of attending hospital or seeking medical attention or in some cases due to ignorance. That bilateral blindness should be seen with Primary Closed Angle Glaucoma is most unfortunate because it seldom affects both eyes at the same time and also because the symptoms are almost always distressing which make the patient aware that something is wrong with his or her eye. Another interesting point is the fact that the Chinese race shows a greater susceptibility to closed angle glaucoma.

OPTIC ATROPHY

Optic Atrophy has always been a major cause of blindness, although it is being superceded by Glaucoma (Acquired Primary) in recent years. Syphilis has been a most important and frequent cause in those in whom an aetiological factor was found. Of 70 cases of Optic Atrophy registered blind in recent years, 24 are due to syphilis. Arteriolar sclerosis with hypertension has been a fairly common aetiological factor as well. As neuro-syphilis is being seen much less commonly these days, it is expected that as a major cause of blindness due to Optic Atrophy, it will gradually decrease with better social hygiene measures available.

Blindness due to Glaucoma appears to be more frequently seen in the older age group (greater than 56 years of age), whilst Optic Atrophy is seen a bit more frequently in the 16-55 years age group.

RETINAL DEGENERATION

In this particular group several causes are seen and include diabetic retinopathy, senile changes, detachment of the retina and myopic degenerative changes. This group is becoming increasingly prevalent and is likely to become a major cause of blindness as the average age of expectancy of life increases as it has done in the last decade.

CORNEAL CAUSES

Corneal causes are definitely on the decline and blindness from Keratomalacia has hardly been seen in the last four years.

TABLE VI

AGE GROUPS (1964-APRIL 1968)

Age	No. of Cases
Less than 16 years of age	75
16-55 years	154
Greater than 56 years of age	172

This last table, Table VI, shows the distribution of those blind according to age groups. There is no doubt that those over 56 years of age predominate.

PREVENTION OF BLINDNESS

With the resultant change in pattern of blindness partly due to:—

1. Better hospitals and public health services
2. Education
3. Better living standards

We now see that emphasis in a prevention of blindness programme must be made on:—

(a) Glaucoma
(b) Retinal Degenerative diseases, and
(c) Congenital conditions

While perhaps very little in practice can be done to reduce blindness from retinal degeneration and congenital causes, Glaucoma however is another matter. The Department of Ophthalmology of the Ministry of Health has in the past ten years been aware of this problem and has been tackling it to the best of its ability. In the ensuing year, it is hoped that with the Society of Ophthalmology of Singapore, and other agencies, more publicity will be given to this aspect of blindness so that public awareness may be aroused and also the fear of going to hospital may be allayed.

A final word on trauma, particularly industrial trauma, as a cause of visual disability would be useful at this time.

In a recent study of the Occupational Eye Diseases and Injuries in Singapore, some of the facts that have been uncovered are quite revealing. About 12% of all patients attending the Eye Department in the year 1964, 1965, and 1966 did so because of injury to the eye. Nearly 50% of these cases due to injury were in the economically active age group of 20-40 years of age. In this particular group, males were affected 9 times more so than females. Industrial and Occupational Injuries took the highest toll amounting for over 50% of this age group. Accidents at home or at play accounted for 20%. Traffic injury accounted for 4% only. Nearly 3% of all cases studied in this age group (20-40 years), suffered severe lost of vision. This is a most important point to remember. Partial or complete lost of vision in one eye will severely limit the occupational scope of those injured. Of the injuries that were seen, superficial corneal injuries were most common and formed more than half

of the total of this particular age group, that is from 20-40 years of age. Although fortunately very few of these became blind, yet many of these accidents to the eyes could have been prevented by proper precautions and safety aids and much of the complications and tragic consequences could have been mitigated by proper first aid treatment.

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