

Prevalence and incidence of blindness due to age-related cataract in the rural areas of South Africa

C. D. Cook, A. A. Stulting

Objectives. The Bureau for the Prevention of Blindness is responsible for the provision of cataract surgery to the rural indigent population of South Africa. It is important for the Bureau to know both the prevalence and the incidence of cataract blindness in the population.

Design, setting and subjects. Blindness prevalence surveys were conducted in KwaZulu in 1990 and 1993.

Outcome measures and results. The prevalence of cataract blindness was 0,59% (95% confidence interval 0,21) in 1990 and 1993. The prevalence of aphakia was 0,1% in 1990 and 0,2% in 1993, demonstrating a probable increase in the delivery of cataract surgical services, although this had not produced a demonstrable fall in the prevalence of cataract blindness. The calculated annual incidence of cataract blindness was 0,14%.

Conclusion. Among a rural population of approximately 19 million South Africans, there is a backlog of 113 000 unoperated cataract-blind people and an incidence of 27 000 new cataract blind per year. The implications of this backlog for cataract blindness in our rural areas are discussed.

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Age-related cataract is a non-preventable disease of ageing. Surveys in other countries in Africa show a blindness prevalence of 0,7 - 1,3%, with cataract responsible for 40 - 57% of cases.¹⁻³ It is the single largest cause of blindness on the continent, affecting an estimated 3 million people.^{4,5} In South Africa, a population-based survey conducted in northern KwaZulu in 1990 showed a blindness prevalence of 1,00%, with cataract the major cause responsible for 59% of cases.⁶ One can reasonably extrapolate these findings to other rural areas in South Africa and, from population census figures, derive estimates of the number of people affected in those areas. This is important in the planning of the provision of eye care services to these rural areas.

Department of Ophthalmology, Edendale Hospital

C. D. Cook, M.B. CH.B., F.C.S. (OPHTH.) S.A., F.R.C. OPHTH.

Department of Ophthalmology, University of the Orange Free State, Bloemfontein

A. A. Stulting, M.B. CH.B., M. MED., F.R.C. OPHTH., F.C.S. (OPHTH.) S.A.

Method

The Bureau for the Prevention of Blindness, in conjunction with the KwaZulu Department of Health, conducted a low vision and blindness prevalence survey in Mosvold Hospital health ward in the Ingwavuma district of northern KwaZulu in September 1990⁶ and July 1993.

This is an area of 2 100 km² with a population of 81 901.⁷ It borders Swaziland in the west and Mozambique in the north. It is an isolated rural area. The people live in scattered homesteads. They are subsistence farmers, who grow maize and keep cattle and goats.

In each survey, all people living in the Mosvold Hospital health ward made up the sampling frame. Each survey examined different individuals from this sampling frame. A random cluster sampling technique, using 60 clusters of 100 people each, was used. The clusters were selected on the basis of a probability proportional to population size procedure. The initial homestead for each cluster was randomly selected, and adjacent homesteads were then visited until 100 people per cluster were found. All residents of the homestead containing the 100th person were included in the sample.

Each of the 12 field teams comprised 2 nurses. Each team surveyed a single cluster per day. The age and sex of each person in the homestead at the time of the survey were recorded. Visual acuity was assessed by means of a standardised technique with a Snellen 'E' chart. All who were unable to read the 6/18 line with one or both eyes, young children or infants whose mothers or guardians said they had an eye problem, people who wore glasses for distance vision, and people who reported having had an eye operation were seen by the ophthalmologist on the same day.

The ophthalmologist's examination comprised measurement of the visual acuity in each eye with and without spectacle correction, examination of the anterior segment with a torch light, and examination of the optic disc and macula with a direct ophthalmoscope. Where indicated, it also included a subjective refraction and Schiotz tonometry.

The severity and causes of visual loss and blindness were classified according to the WHO classification.^{8,9} People who had had cataract surgery were included as 'aphakic'.

Results

In the first survey, a total of 1 044 homesteads were visited, and 6 090 people screened. Two hundred and ninety-three people were referred for ophthalmological assessment, and 268 (91,5%) were seen by the ophthalmologist. The remaining 25 people who should have been seen did not arrive at the arranged rendezvous points and were absent when the ophthalmologist visited their homes in an attempt to locate them. The final study group that fulfilled the inclusion criteria comprised 241 people.

In the second survey, 879 homesteads were visited and 6 132 people screened. Of 298 people referred for further assessment, 269 (90,3%) were seen by the ophthalmologist. The final study group that fulfilled the inclusion criteria comprised 234 people.

The prevalence of blindness due to age-related cataract in 1990 and in 1993 is shown in Table I. The estimated incidence and prevalence of blindness due to age-related cataract for the rural areas of South Africa are shown in Table II.

Table I. Prevalence of blindness due to age-related cataract in northern KwaZulu in 1990 and 1993

	1990	1993
Sample size	6 090	6 132
Number of people sampled with untreated blindness due to age-related cataract	36	36
Number of people sampled with aphakia	6	12
Prevalence of untreated blindness due to age-related cataract (%)	0,59 ± 0,21	0,59 ± 0,21
Prevalence of aphakia (%)	0,1	0,2

Table II. Estimates of the incidence and prevalence of age-related cataract blindness in all the rural areas of South Africa

Total rural population	19 170 411
Rural population 65 years of age and older	742 263 (3,9%)
Prevalence of untreated cataract blindness (0,59%)	113 105 (± 40 258)
Estimated annual incidence of cataract blindness, using formula $I = P/D$ (0,14%)	26 839 (± 17 253)

Discussion

The South African Bureau for the Prevention of Blindness is responsible for the provision of cataract surgery to the rural indigent population of South Africa. It is important for the Bureau to know both the prevalence and the incidence of cataract blindness in the population. Two formulae have been used to estimate the annual incidence of cataract blindness. One is $I = P/D$, where I = annual incidence, P = overall prevalence and D = duration of the condition in years. It is practice to use 5 years as the survival time for age-related cataract in Africa. The alternative formula is to multiply the number of people in the 60 years and above age group by 0,08. This factor is derived from a knowledge of the prevalence of cataract blindness in this age group, the life expectancy at age 60 years, and the number of people turning 60 annually. Both formulae presuppose that the incidence rate is offset by an equal mortality rate, with no change in the prevalence. We have used a prevalence of 0,59%⁶ and a calculated annual incidence of 0,14%⁴ from the formula $I = P/D$, where P is the overall prevalence (including aphakia) and D is 5 years.

Using these data, we calculate that for a rural population of approximately 19 million South Africans, there is an untreated backlog of 113 000 cataract-blind people and an incidence of 27 000 new cataract-blind per year.

The Bureau provided cataract surgery to 2 237 people at 20 centres (70 clinics) in the rural areas of South Africa in 1992. This represents only 2% of the cataract backlog or less than 10% of the annual incidence. Given that rural,

indigent cataract-blind patients were offered surgery on one eye only, it would be necessary to do 27 000 cataract operations per year to meet the incidence of new blind cases. Each of the 250 ophthalmologists working in South Africa would need to contribute 21 days per year, and the Bureau would need to conduct 1 300 clinics at a cost of R10 million, according to the present rate of service delivery.

This problem of an unmanageable backlog of cataract surgery is well documented in other countries.^{5,10} As has been recognised and implemented elsewhere in Africa, there is an urgent need to train ophthalmic medical assistants to work in permanent sight-saver clinics in the rural areas of South Africa.

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