

# A study on the awareness of cataract disease and treatment options in patients who need surgery in a rural area of Eastern China

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**PURPOSE.** *To investigate the awareness of cataract disease and treatment and to determine the major barriers for patients who need cataract treatment in a rural area of eastern China.*

**METHODS.** *A total of 251 cataract patients were selected by means of eye disease screenings throughout Jiangyan County. Questionnaires were administered after the doctor determined that the patient needed cataract surgery. The patient's awareness questionnaire was developed by Fletcher and clinically validated at the Aravind Eye Hospital in India.*

**RESULTS.** *A total of 89.6% of patients had been aware of their condition for more than 1 year. Only 49.8% of all patients had known for more than 1 year that their eye disease could be treated. The major barriers for those seeking eye treatment included residual functional vision (49.0%), financial problems (36.7%), no demand for the operation (8.8%), and skepticism about the operation (8.8%). Poor vision function grade and female gender were two significant factors associated with a longer awareness (>3 years) of the existence of cataracts. Patients with a history of eye disease and a longer awareness of eye disease were more likely to have known about the potential treatments for a longer period of time (>1 year).*

**CONCLUSIONS.** *The patients' awareness of the presence of cataract disease and potential treatment were unbalanced. The main treatment barriers were lower demand for vision improvement and financial problems. It is imperative to educate patients on eye health care and to provide low cost, but high quality, cataract surgery to these patients. (Eur J Ophthalmol 2008; 18: 544-50)*

**KEY WORDS.** *Awareness, Cataract, Preventing blindness, Survey*

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*Accepted: February 14, 2008*

## INTRODUCTION

Cataracts are the leading cause of blindness in China (1, 2). While the incidence of cataracts is high, cases of blindness can be attributed mostly to the low rate of treatment for the disease. This lack of treatment may be attributed to several factors, including poor patient awareness, low socioeconomic status, cultural beliefs, and a poor stan-

dard of living. Therefore, a survey on these aspects will aid current prevention and treatment strategies, as well as provide a basis for formulating new strategies for the prevention and treatment of blindness caused by this condition.

Recent surveys performed in various countries and areas worldwide have investigated cataract patients' willingness to pay for cataract surgery (3-6) as well as the barriers

preventing them from undergoing cataract surgery (7-16). In a study done in Nepal, Shrestha et al found that although patients were aware that treatment was available and that such services were provided nearby, they were not willing to pay for the surgery or use the facility primarily due to their poverty. The investigators considered that in order to change patients' attitudes, a more holistic approach is needed, keeping in mind the cultural, social, and economic background of the society (3). Fletcher et al investigated the use of services in a rural Indian population served by outreach eye camps to identify barriers to patients using these services. Their investigation showed that fear (principally of eye damage), cost (direct and indirect), family responsibilities, ageism, fatalism, and an attitude of being able to cope (with low or no vision) were the principal barriers to attending the eye camps (16). Another survey of patient awareness in Doumen County in southern China (18) demonstrated that, of the patients with treatable ocular disease in Doumen, only 24.2% of patients realized that their eye disease could be treated on the day of their examination. The major barriers for seeking eye care were economic reasons, fear of the operation, and distance from the hospital. This indicates that the barriers to eye treatment are different in different areas of the world and are in need of further investigation.

China is a vast country with a large population with numerous and varied cultures and customs, and which has an unbalanced economy in terms of rural and urban areas. We are not aware of any previous investigation of the awareness of cataract disease and treatment options from the eastern area of China. Herein, we describe our investigation of the patients' awareness of cataract disease, their knowledge about cataract treatment, and major barriers to their seeking eye treatment in Jiangyan County, Jiangsu Province, a rural area of eastern China.

## METHODS

This study was conducted in Jiangyan County, which is representative of the geographical character, economic status, developing culture, and health care conditions in the rural areas of eastern China. It is primarily a rural population of middle socioeconomic status in the Jiangsu Province, which is a relatively developed area in China. The *Sight First China Action* cataract surgery team performed cataract surgeries in the region. The ethics committee of the Affiliated Hospital of Nantong University ap-

proved the survey, and consent forms were also obtained from each patient participating in this study.

Survey patients were selected from patients found throughout the county by the mobile eye disease screening camps organized by the county government. Local ophthalmologists and specially trained local healthcare workers were responsible for the eye examinations. All individuals were given a basic eye examination using visual chart and penlight including distance visual acuity, an examination of the eyelids, conjunctiva, cornea, anterior chamber, iris, pupil, lens, and ocular movement. All potential eligible patients were given an examination with slit-lamp microscope, direct ophthalmoscope, correction glass, and Schiötz tonometry in the hospitals before surgery. A total of 251 patients with best-corrected vision less than 6/18 in at least one eye due to cataract disease and excluding corneal disorders were identified as needing surgery. Three patients had a prior history of cataract surgery in one eye. None of the patients had health insurance, and received support from the county government and the *Sight First China Action* for their cataract surgery. The interviews were administered at once in separate rooms by one of two trained interviewers after the potential eligible patients were identified and were not informed in mobile eye disease screening camps. The data of ineligible patients were excluded at last. The patients were told that they may refuse the interview and were asked to be honest in answering the questions if they accepted the survey. They had been informed that the personal answers would be confidential and would not be reported individually and that their answers would not affect their treatment or the cost. A few patients with slight hearing impairments finished the questionnaire with the help of a family member. We have done pretest in the same way with these types of patients before formal survey. Pilot data are not included in the results. The first two items of the questionnaire were regarded as parameters to measure the test-retest reliability of observer variation; all of the interviewees began their formal work only if they had test-retest reliability of at least 0.7.

The patient's awareness questionnaire, which was designed specifically for developing countries and regions, was originally developed by Fletcher et al and was clinically validated at Aravind Eye Hospital in India. The questionnaire was translated into Chinese by Xu J. et al and was employed previously in Doumen County in southern China in 1997 (17). We changed the first two items of the questionnaire from closed-ended to open-ended (Tab. I).

### Data analysis

The visual acuity data were recorded relative to the normal living vision, i.e., the corrected visual acuity was recorded if the patient usually wears glasses, or the uncorrected visual acuity was recorded if the patient does not wear glasses even if his or her visual acuity can be corrected with glasses (18). Bilateral vision is classified into five grades according to visual acuity in the better eye vs the worse eye as in the report of Pokharel et al (19).

The survey database was established using Epidata 2.0 software. Data were verified according to the two input data copies. The SPSS 12.0 software package was used for statistical analyses.

### RESULTS

A total of 251 patients, average age 69.9±9.9 years (range: 37~95 years), accepted the survey. Most of the patients (92.0%) were farmers who lived in the country, and 8.0% were housewives and retired workers who lived

in small towns. A larger percentage (60.2%) of patients were female, and their average age was 69.5 years. The remaining 39.8% of patients were male, and their average age was 70.4 years. Detailed information about the cataract patients is presented in Table II. There was no statistically significant difference between the average age of men and women ( $p=0.522$ ). More than half (57.8%) of the patients were illiterate, and another 33.5% of patients had only an informal education (less than 5 years). None of the patients refused the questionnaire, and none of the patients questioned had Alzheimer disease.

The length of time that patients had been aware of their existing eye disease is shown in Table III. The time ranged from 1 month to 480 months with a median of 36 months. Taking those who had been aware of their disease for less than 36 months as a control group, we analyzed the likelihood ratios of the patients' knowledge using multifactorial stepwise analyses. The results showed that vision status grade (OR: 2.518, 95% CI: 1.466–4.325,  $p=0.001$ ) and gender (OR: 1.783, 95% CI: 1.021–3.114,  $p=0.042$ ) were variables with statistical significance for the length of time that patients had known about their disease. Age, level of

**TABLE I - PATIENT'S AWARENESS QUESTIONNAIRE**

- 
1. When did you first realize that your vision was not good?
    - a) Less than 1 month
    - b) 1 month to 6 months
    - c) 6 months to 1 year
    - d) More than 1 year
  
  2. When did you realize that your eye disease can be treated?
    - a) Today
    - b) Less than 1 month ago
    - c) 1 month to 6 months ago
    - d) 6 months to 1 year ago
    - e) More than 1 year ago
    - f) Don't know
  
  3. Did you ever try to get treatment for your eye before? (If the response is No, please go to Question 5)
    - a) No
    - b) Yes
  
  4. Why haven't you received treatment for your eye problem (for example: surgical or medical treatment)?
    - a) Financial problems (no money for transport and treatment, etc.)
    - b) Afraid (about the surgery and new place not familiar with, etc.)
    - c) No time
    - d) Can still see a bit/cataract is not "mature" yet
    - e) Too far, no people to accompany me
    - f) Don't want to be operated on
    - g) Don't believe surgery can help
    - h) Other, please specify \_\_\_\_\_
    - i) Don't know
  
  5. Why didn't you try to find a way to treat your eye (for example: to see doctor)?
    - a) Financial problems (no money for transport and treatment, etc.)
    - b) Afraid (about the surgery and new place not familiar with, etc.)
    - c) No time
    - d) Can still see a bit/cataract is not "mature" yet
    - e) Too far, no person to accompany me
    - f) Don't want to be operated on
    - g) Don't believe surgery can help
    - h) Other, please specify \_\_\_\_\_
    - i) Don't know
-

**TABLE II - PATIENT DEMOGRAPHICS**

	Male	Female
<b>Age, yrs</b>		
≤49	3	7
50–59	11	19
60–69	22	43
70–79	53	57
80+	11	25
<b>Education, yrs</b>		
0	27	118
1–3	28	13
4–5	27	15
6–8	18	5
<b>Inhabiting area</b>		
Small town	10	31
Village	90	120
<b>Occupation</b>		
Farmer	98	149
Worker	2	2
<b>Total</b>	100	151

education, systemic disease, and eye disease history were not significant factors in how long patients had known they had cataract disease. These variables were fitted in an equation:  $y = -2.547 + 0.578x_1 + 0.924x_2$  ( $y$  = the time of the patients were aware of their eye disease,  $x_1$  = gender,  $x_2$  = vision status grade).

The distribution of patients' awareness that their eye disease could be treated is presented in Table IV. The time that the patients knew their eye disease could be treated ranged from 0 to 480 months. The control group was selected from a group who knew for less than 12 months that their disease could be treated, and forward stepwise analysis was done to determine likelihood ratios. The results suggested that the history of eye disease (OR: 3.461, 95% CI: 1.798–6.665,  $p=0.000$ ) and the time a patient was aware of his or her eye disease (OR: 4.852, 95% CI: 2.711–8.684,  $p=0.000$ ) were two variables that had statistical significance for determining how long a patient had been aware his or her condition was treatable. However, the patients' age, gender, education level, and histo-

**TABLE III - THE LENGTH OF TIME PATIENTS WERE AWARE OF THEIR EYE DISEASE**

Time	Cases*	Age, yrs				Gender	
		<60	60~	70~	>80	Male	Female
Less than 1 month	0	0	0	0	0	0	0
1–6 months	7 (2.8)	3	2	2	0	4	3
6 months–1 year	19 (7.6)	2	8	7	2	7	12
More than 1 year	225 (89.7)	35	55	101	34	89	136
Total	251	40	65	110	36	100	151

\*Values (n) are given as percentages

**TABLE IV - THE LENGTH OF TIME THAT PATIENTS WERE AWARE THAT THEIR EYE DISEASE COULD BE TREATED**

Time	Cases*	Age, yrs				Gender		Education, yrs		
		<60	60~	70~	>80	Male	Female	0	0~	5~
Today	0	0	0	0	0	0	0	0	0	
Less than 1 month ago	18 (7.2)	1	2	8	7	5	13	16	2	0
1–6 months ago	63 (25.1)	9	17	26	11	30	33	40	19	4
6 months–1 year ago	45 (17.9)	7	14	18	6	17	28	21	18	6
More than 1 year ago	125 (49.8)	23	32	58	12	48	77	68	44	13
Don't know	0	0	0	0	0	0	0	0	0	0
Total	251	40	65	110	36	100	151	145	83	23

\*Values (n) are given as percentages

ry of systemic disease were not statistically significant. The variables were fitted in another equation:  $y = -3.856 + 1.242x_1 + 1.579x_2$  ( $y$  = time that patient knew his or her eye disease could be treated,  $x_1$  = past history of eye disease,  $x_2$  = time that patient knew of his or her eye disease).

The bilateral vision status and the main barriers preventing patients from receiving treatment appear in Table V. The questionnaire was multiple choice, so patients sometimes selected several factors as being barriers to their receiving treatment. A total of 77.7% of the subjects had seen a doctor on their own initiative for their current eye disease; the reason they had not been treated before included primarily residual visual acuity (39.9%) and financial difficulties (34.8%). A minority (22.3%) of the patients had not previously consulted a doctor about their current eye problem. These patients had not previously consulted a doctor for several reasons, but 44.2% cited financial hardship and 25.0% cited residual visual acuity as the reasons they did not seek medical attention. It was observed that there were three variables with statistical significance with regard to seeking medical care, including age (OR: 1.044, 95% CI: 1.006–1.083,  $p=0.024$ ), a longer (more than 36 months) awareness of the existence of eye disease (OR: 2.070, 95% CI: 1.001–4.281,  $p=0.05$ ), and a longer (more than 12 months) awareness that their eye disease could be treated (OR: 0.183, 95% CI: 0.084–0.397,  $p=0.000$ ). Gender, education level, a past history of eye disease, and systemic disease were shown to be without statistical significance.

## DISCUSSION

The cataract surgical rate (CSR) in China is only 448.7 (20). During the same period, the CSR in the North America was more than 5,500 (21). In order to achieve a higher CSR, it is necessary to investigate the barriers that may be preventing patients from seeking surgery. As part of this goal, we carried out this survey to better understand the patients' awareness of their disease and treatment options.

The results showed that the patients' awareness of eye disease and the patients' awareness of treatment options were unbalanced, although there are two hospitals with ophthalmology departments that have the ability to perform extracapsular cataract extraction (ECCE) and intraocular lens (IOL) implantation within 30 kilometers. The results also showed that women were more likely to be aware of existing eye disease than men. It is possible that this is due to the fact that women more frequently perform tasks that require near vision than men, suggesting that they rely more on their vision than men, or that they notice their failing vision sooner than men.

Particularly concerning was the patient awareness of eye health. In the survey, the interviewers found that many patients did not initially associate their low vision with their eye disease, and some of them had relied on therapy such as praying, burning incense, drinking fairy water, and begging god to protect their vision. This suggests that, similar to other developing areas, the patients in rural areas of eastern China urgently need health education. Since the

**TABLE V - THE MAIN BARRIERS PREVENTING CATARACT PATIENTS FROM RECEIVING TREATMENT \* (%)**

Barrier	Vision status				Total (n=251)
	Visual impairment (n=16)	Unilateral blindness (n=137)	Moderate bilateral blindness (n=13)	Severe bilateral blindness (n=85)	
Financial difficulties	0.8	20.3	2.8	12.8	36.7
Afraid	0	2.0	0	2.4	4.4
No time	0	4.4	0	1.2	5.6
Can still see a bit	5.6	28.3	3.2	12.0	49.0
Inability to travel	0	1.6	0	0.4	2.0
Don't want surgery	0	3.2	0.8	4.8	8.8
Don't believe in surgery	0	4.0	0.4	4.4	8.8
Other	0.4	11.2	0	5.6	17.1

\*The question was multiple choice, so some patients indicated that more than one factor was a barrier to their receiving treatment

patients did not associate their vision loss with eye disease, it was not surprising that they were not aware that therapeutic options were available.

The greatest barrier to treatment was residual vision, rather than financial difficulties, which was not consistent with the studies from other areas (3, 7, 9, 10, 16, 17). However, the poor state of the economy cannot be overlooked as being at least partly responsible for the low demand for vision and cataract treatment. Other barriers to treatment, such as patients not wanting to have surgery and not believing that surgery can help, were also mentioned. During the survey, we found that one failed cataract case in an undeveloped area can lead several other patients around him/her to refuse surgical treatment. It is easy to imagine that a poor outcome of the surgery would become an even more serious barrier to other patients accepting surgery if the surgery is not free. This indicates that more attention should be paid to the quality of cataract surgery (15, 16). Women were found to have a significant excess of severe visual impairment and blindness after adjustment for age differences (1, 2, 22, 23). Female patients were less likely to accept cataract surgery in some areas (13, 15). However, we have not concluded that gender was a barrier for cataract surgery in Jiangyan from this survey.

The sample population used in this survey was not collected randomly. However, 251 cataract patients were selected by means of eye disease screenings throughout Jiangyan County. The results can be treated as reliable. Of note, this survey did not examine the income of the patients' family and the patient's control of family finances. This deficiency may result in some information being overlooked. However, the patients recruited in this survey were mostly older patients, and many of them were no longer in control of their family's income. Thus, it is difficult to accurately survey their income level and access to income.

In summary, cataract patients' awareness of cataract disease and their awareness of treatment were unbalanced in Jiangyan. The most significant barriers to seeking treatment were the lack of need for vision improvement and financial hardship. The patients urgently need health care knowledge and affordable, accessible, and dependable (safe and effective) surgery.

## ACKNOWLEDGEMENTS

The authors thank David Coulson and Kirk Halvorson, Pacific University College of Optometry, Portland, Oregon, and He Mingguang at Zhongshan Ophthalmic Center, Sun Yat-sen University, Guangzhou, P.R. China, for their assistance in preparing this paper. The authors also thank Yu Jianping, Hong Liu, Xu Changshan, and Mei Xiaofei, Department of Ophthalmology, The People's Hospital of Jiangyan, and Liu Jinghua and Zhou Shuping, Department of Ophthalmology, The Chinese Medicine Hospital of Jiangyan, Jiangsu, P.R. China, who were instrumental in helping perform this research.

*This research was supported by a grant from the Lions Club International Foundation.*

*The first two authors should be regarded as joint first authors. The authors have no financial interest in the publication of this article.*

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