Original Article

Role of eye screening camp in detecting systemic diseases and promoting health-seeking behaviour in the rural population – A multi-centre study

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Abstract

Purpose: The 'Gift of Vision', a rural outreach eye programme, is a doorstep-to-doorstep programme that includes identification of curable eye ailments, logistical transport, and surgery at a base hospital. As part of these screening camps, a cursory systemic examination is conducted to identify systemic conditions that could increase morbidity while the patient is undergoing treatment for their eye conditions at the hospital. The purpose of the study was to analyse the benefit of outreach eye screening camps towards the 2030 agenda of promoting health and well-being in rural India. **Materials and Methods:** This prospective observational multi-centric study included patients attending eye camps and declared systemically unfit for cataract surgery, who were subjected to a structured questionnaire via a telephonic interview from April 2023 to December 2023. Patients' health seeking behaviour and barriers to healthcare were analysed. **Results:** A total of 7906 patients from 35 camps were screened for cataract. A total of 1340 were found to be 'unfit' for surgery. A total of 606 patients responded to our telephonic interview. A total of 524 (86.5%) patients visited a primary health care physician for systemic treatment, and 466 (76%) were compliant with the medications. A total of 179 (29.5%) patients were newly detected with systemic comorbidity during outreach screening. Ignorance, time constraints, domestic issues, lack of family support, financial issues, and lack of transport were the common barriers to seeking healthcare. **Conclusion:** Outreach screening not only helps in improving vision in people with visual impairment in rural India but also provides opportunities to enforce health seeking behaviour for systemic comorbidities aligned to Sustainable Development Goal 3.

Keywords: Cataract screening, community health, eye camp, healthcare seeking behaviour, outreach screening, systemic comorbidities

Introduction

The United Nations Sustainable Development Goals agenda for 2030 looks at a goal to reduce premature mortality from non-communicable diseases.[1] Cataract was the principal cause of blindness (66.2%) in The National Blindness and Visual Impairment Survey 2015–2019.[2] In the geriatric population, cataract and systemic diseases are closely associated.[3] According

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to The Indian Council of Medical Research India Diabetes Study (ICMR-INDIAB study), India had 62.4 million people with diabetes and only 41.5% of the general population reported knowing a condition called diabetes.[4]

The 'Gift of Vision', a rural outreach eye programme, is a doorstep-to-doorstep programme that includes identification of curable eye ailments, logistical transport, and surgery at a base hospital that has been ongoing since 1990. This method has been shown to increase the demand for eye surgery by eliminating barriers of availability, accessibility, and affordability.[5] As part of these screening camps, a cursory systemic examination is conducted to identify systemic conditions that could increase morbidity while the patient is undergoing treatment for their eye conditions at the hospital. Around 15% of these patients identified are counselled to control their systemic condition and return to the next outreach camp to be selected for the surgical procedure.

We wanted to assess, when patients are told they are 'unfit' for cataract surgery, whether it would incentivize patients and their attender to seek expert help for these potentially life-threatening conditions. The purpose of the study was to analyse the benefit of outreach eye screening camps towards the 2030 agenda of promoting health and well-being in rural India.

Materials and Methods

This prospective observational study was conducted after obtaining approval from the institutional ethics committee. The study period was from April 2023 to December 2023. We looked at data from outreach eye camps conducted in two states of South India (Karnataka and Andhra Pradesh).

At the outreach campsite, visual acuity was measured using a portable Snellen's chart. A doctor then examined the patients to identify surgically treatable conditions. These patients were counselled for the need for surgery. Their vitals and systemic condition were also recorded. Pulse rate and oxygen saturation (SPO2) were checked with a portable pulse oximeter, blood pressure (BP) with a digital sphygmomanometer, and random blood sugar (RBS) with a glucometer by trained nursing staff. As per the institute's Standard Operating Procedure, patients were categorised as fit and unfit for cataract surgery [Table 1].

Those considered unfit were sensitised about their condition and were advised to seek treatment from experts for their systemic condition and follow-up with a fitness certificate from the treating doctor. A telephonic interview was done by trained interviewers based on a pre-determined script 3 weeks after the conduct of the outreach camps in their native language. Details of the patients who responded to the survey were considered for analysis.

Statistical analysis

A statistical package SPSS version 23.0 was used for the analysis. Data were summarised by the mean and standard deviation (SD). Categorical variables were presented as frequency and percentage. The Chi-square test was used for comparisons of categorical variables. A probability (*P*) value less than 0.05 is considered as significant at 95% confidence level.

Results

Seven thousand nine hundred and six patients from 35 camps were screened for cataract. One thousand three hundred and forty were found to be "unfit" for surgery. Six hundred and six patients responded to our telephonic interview. A total of 299 (49.3%) were males, and 307 (50.7%) were females. The mean age was 62.16 years (range 40–85 years). 64.3% of patients were detected with diabetes mellitus, 46.3% with hypertension, 0.8% with ischemic heart disease, and 0.1% with bronchial asthma. 11.7% of patients had more than one systemic disease.

Among the 606 systemically unfit patients, 524 (86.5%) patients visited a primary health care physician for systemic treatment and 82 (13.5%) patients did not. A total of 179 (29.5%) patients were newly detected with systemic comorbidity during outreach screening. Among the newly detected, 159 patients (88.8%) sought systemic treatment, and 12 were found to be normal. Four hundred and twenty-seven patients were known to have the disease but were uncontrolled cases, among which 365 (85.5%) patients visited a physician for follow-up and 330 (77.3%) were regular with their medications. Furthermore, 136 were newly detected and compliant with treatment [Table 2].

The patients who did not seek medical help or were not regular with medications reported time constraints, domestic issues, lack of family support, financial issues, lack of transport, and ignorance as the barriers to seeking healthcare [Table 3]. Physician visit subsequent to detection at camp and compliance with medications was comparable between newly detected patients and those with known uncontrolled disease [Tables 4 and 5].

Discussion

Patients presenting with cataracts are primarily in the geriatric age group, and patients in this age group are more likely to have associated systemic comorbidities. For 29.5% of patients from rural areas of India, eye camps may be their first encounter with any form of health care. The practice of recording vitals in cataract screening eye camps can raise awareness among the population about systemic diseases. In the studies conducted

Table 1: Criteria to declare patients unfit for cataract surgery

Systemic Parameter	Patients declared unfit for selection for surgery if
Hypertension	>140/90 mm Hg
Diabetes Mellitus	>200 mg/dl
SPO_2	<95%
General Examination	Open wounds, Debilitated, Obvious respiratory conditions (wheezing, rhonchi), ectopics on auscultation

Table 2: Health seeking behaviour and compliance to treatment

	Total Patients (606)		Known, uncontrolled (427)		Newly detected (179)	
Physician visit						
Yes	524	(86.5%)	365	(85.5%)	159	(88.8%)
No	82	(13.5%)	62	(14.5%)	20	(11.2%)
Regular intake of meds						
Yes	466	(76%)	330	(77.3%)	136	(76%)
No	140	(23.1%)	97	(22.7%)	43	(24%)

Table 3: Barriers to seeking healthcare

Barriers	Percentage (%)
Ignorance	30.4
Time constraint	20.8
Domestic issue	18.2
Lack of family support	15.6
Financial issue	13
Lack of transport	0.8

by Kashyap *et al.*,[6] Khan *et al.*,[7] Al-Shaer *et al.*,[8] Behera *et al.*,[9] and Mishrikotkar *et al.*,[10] hypertension was noted to be the most common comorbidity, followed by diabetes mellitus. Our study is agreeable with Kumar *et al.*[11] study, which noted that diabetes mellitus was more common than hypertension in the study population. We also found that 0.8% had ischaemic heart disease, while 0.1% had asthma. Thus, our study, along with others, reinforces the need for checking vital parameters as a part of the outreach eye camp.

In our study, on average, 76% of patients, uncontrolled and newly detected combined, were regular with their medications. These numbers were more than those noted by Kumar *et al.*[11] (70% in known hypertensives and 60% in known diabetics).

Systemic comorbidities also interfere with cataract surgery. Hence, though we conducted eye screening camps, patients were also screened for systemic parameters, giving them a dual benefit under one roof. Ciancio A *et al.*[12] conducted a study to determine the effectiveness of population health screenings in reducing the burden of non-communicable diseases in low-income countries and found that health screening increased the probability of being diagnosed and also increased the intake of medication.

Our study also analysed the secondary outcome of the eye screening camps with the help of telephonic conversation, where we tried to understand the barriers that the patients faced in seeking treatment for their systemic illnesses. We found that a voluntary approach to healthcare centres for screening of non-communicable diseases needs to be improved among the people of rural India due to the lack of knowledge about the systemic comorbidities and their long-term sequelae. More so, the 'silent' systemic comorbidity is not as bothersome to the patients as their visual handicap due to cataract, which hampers their day-to-day activities and daily wages. Hence, a pitiable situation arises where patients show compliance to the medicines only up to procuring pre-operative fitness from the physician. We recommend that healthcare workers should emphasise that post-operative uncontrolled systemic disease, especially diabetes, can deteriorate the surgery results.

Table 4: Comparison of physician visit subsequent to detection at camps between newly detected patients and those with known uncontrolled disease

	Newly detected at our outreach		Total
	Yes*	No	
Physician visit subsequent to detection			
Yes			
n	159	365	524
%	88.8%	85.5%	86.5%
No			
n	20	62	82
%	11.2%	14.5%	13.5%
Total			
n	179	427	606

*χ^2=1.207 (P=0.272)

Table 5: Comparison of medication compliance between newly detected patients and those with known uncontrolled disease

	Newly detected at our outreach		Total
	Yes*	No	
Regular intake of medications			
Yes			
n	136	330	466
%	76.0%	77.3%	76.9%
No			
n	43	97	140
%	24.0%	22.7%	23.1%
Total			
n	179	427	606

*χ^2=0.121 (P=0.728)

In our study, the most common barrier to seeking healthcare among the rural population was ignorance about the disease and the need for regular long-term treatment, followed by lack of time or loss of pay in the working class of patients, lack of family support or no family member to accompany the elderly patients, financial constraint to buy medications, and lack of transport facility in remote areas. Patients delayed their physician visit awaiting the next outreach camp for the follow-up. Similar barriers were noted by B Boro and Saikia[13] in a study conducted among the tribal population in Assam, which includes affordability, lack of education or ignorance, dependence on traditional medicines, poor transport facilities, and poor quality of healthcare.

A survey conducted by Rangavittal S and Narayanan[14] noted poor eye care seeking behaviour among the people of rural

South India and attributed it to lack of awareness and accessibility to health services as major reasons. This emphasises the need for more rural awareness and outreach programs. Another study conducted by RP Finger *et al*.[15] noted that outreach camps organised regularly in the same location increased the acceptance of cataract surgery in the community. This can also be applied to the screening and treatment of systemic illnesses. Regular organisation of eye camps, along with awareness and treatment of systemic comorbidities, will improve patients' knowledge about the disease and compliance with treatment.

As noted in other studies, low socioeconomic status and remote areas with poor connectivity are common barriers to telecommunication access.[16] We, too, were unable to reach 55% of the patients initially screened through the telephonic survey. Lack of a mobile network, wrong phone number, and incoming barred due to financial reasons were some of the issues we noted.

Regular organisation of eye screening camps, where a tangible benefit is perceived in rural areas, can help early detection of systemic comorbidities and maximise benefits of health services.

Conclusion

Outreach screening not only helps improve vision in people with visual impairment in rural India but also provides an opportunity to enforce health-seeking behaviour for systemic comorbidities aligned with sustainable development goal 3. Integration of eye care and systemic healthcare in outreach eye screening will help in improving the quality of life in cataract patients and reducing intra- and post-operative complications.

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Conflicts of interest

There are no conflicts of interest.

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