



Visual Impairment and Blindness in the Rural Population of Western Rajasthan: Effort of a Dutch Foundation to Address the Problem

Shivananda S^{1*} and Pronker ES²

¹Chairman Shared Vision Foundation, The Netherlands

²Erasmus University, Rotterdam, The Netherlands

*Corresponding author: Shivananda S, Chairman Shared Vision Foundation, The Netherlands

President Kennedylaan 188, 2343 GW Oegstgeest, The Netherlands, Tel: +31 (0)715171372; E-mail: shivananda@planet.nl

Rec date: Apr 17, 2014, Acc date: June 13, 2014, Pub date: June 15, 2014

Copyright: © 2014 Shivananda S, et al. This is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.

Abstract

Aim: The aim of this project was to investigate the magnitude of visual impairment and blindness in the rural population of Western Rajasthan and determine how best to address it.

Setting: Jodhpur District of Western Rajasthan. Population 2.8 million. Rural population 67% spread over 860 villages.

Method: An interventional "screen and treat" population based program of village outreach by holding Eye Camps--in remote areas of the District.

Participants: Candidates --lined up for screening at Eye Camps

Results: Of the 49' 518 screened; 32' 615 men, women and children had refractory errors (mainly myopia and presbiopia). This is 66% of the total.

1'350 persons had cataract related blindness. This is 2.7% of the total population screened.

Keywords: Blindness; Refractory errors; Rajasthan; Cataracts

Introduction

It's a poignant tragedy that India has one of the largest quanta of blindness in the world. There are 12 million blind people in India, which is more than one third of the global blind population (32 Million) [1].

Diagnostic Categories	%
Cataract	62.40
Refractive errors	19.65
Glaucoma	5.83
Posterior surgical causes	4.72
Surgical complications	1.15
Corneal opacity	0.89
PCO	0.89
Others (phthisis, amblyopia)	4.47
PCO: Post cataract Capsular Opacity	

Table 1: Leading causes of blindness in population aged 50+yrs-in India (Source: Nationwide survey (1999-2001) to assess prevalence of

blindness. National Program for control of blindness (NPCB), New Delhi)

According to the Indian National Survey of blindness carried out between 1999-2001: Cataract - a condition causing clouding of the lens of the eye leading to progressive loss of vision - is the leading cause of blindness in India (Table 1) [2].

The highest prevalence of blindness in India is in the state of Tamilnadu, where 2.65% of the total population of the state is afflicted. Next to Tamilnadu, the state of Rajasthan has the second highest prevalence of blindness in the country: 2.5 % of the total population of 68.6 million in the state is afflicted [3]. This means that there are nearly 1.7 million blind people in Rajasthan alone.

Western Rajasthan

A large number of the blind and people with impaired vision live in Western Rajasthan. This is one of the poorest areas of the state with an estimated income of US\$2 per day in the rural population doing seasonal agricultural work, road construction and road maintenance. Additionally, the state demographics show high maternal mortality (445 deaths per 1000 live births), infant mortality of 77 per 1000 live births, neo-natal mortality of 60.6 per 1000 live births and the life-expectancy at birth for men was reported to be 53.5 and for women it is 54.5 [4,5].

Methods

The project was designed as a population based “screen and treat” program and not as a clinical trial or a clinical study. Participants provided their verbal consent—on registration—at the Eye Camps. Consent was verbal due to the low literacy rates in the rural population.

All Eye Camps were held at the government schools. These schools are located in market towns and their location is well known to the villagers. The Camps were held on the weekends, on Saturday and/or Sunday, when school buildings were empty and the villagers are generally free from work or the school. The Camp location and date were selected in consultation with Sar-Panch (head of village assembly) and the principal of the public school.

Ten days before the Camp, the villagers were alerted through two channels. Printed information on the Camp was disseminated to the school children and additional house-to-house distribution of the pamphlets was organized. The pamphlets describe the Eye Camp protocol, including a description of the camp location and cost-free eye examination by an eye doctor and two ophthalmic assistants. One day before the Camp, minivans with speaker system drive from village-to-village announcing the Eye Camp. Radio messages were not used to announce the Camp.

Each person was first examined by an ophthalmic assistant and then by an ophthalmologist. They both sit in two separate rooms. The demographic data - such as the age & sex and caste of the candidates are collected by our Eye Camp staff. Diagnostic data are recorded by the ophthalmologist who determines the appropriate treatment.

Individuals with refractory errors (a condition when cornea and lense cannot focus the image of an object sharply on the retina) are prescribed new eye glasses. Those who had cataract and other eye problems that required further diagnostic assessment were taken to an Eye Hospital in the City and offered surgical and/or medical treatment. The Eye hospitals we have used in this project are the Jain Hospital, the Palliwal hospital and the Desai Hospital. They are all in the private sector, located in the city of Jodhpur.

Additionally during the screening process; if the staff discovered other medical problems in candidates lined up for screening they were taken with their consent to the Raj Dadiji General Hospital in Jodhpur managed by the charitable trust of the Maharaja of Jodhpur.

The cost of all medical and surgical treatment, hospital stay, transportation from home to the eye hospital and back to home and the cost of 3 follow-up visits to the medical center were paid for by our Foundation. This includes the cost of new sunglasses and eyeglasses.

Results

Since the inception of Eye Camp program in 2004, as shown in Table 2, 53 Eye Camps have been held, serving a rural population of nearly 1.4 million scattered over 860 villages. Of the 49' 518 screened; 32' 615 men, women and children were diagnosed with refractory errors (mainly myopia and presbiopia). This is 66% of the total screened. They were all given new eyeglasses.

Only 1'350 persons -2.7% of total were found to have cataract in one or both eyes and were submitted to cataract surgery and IOL transplant. This mostly included the elderly, yet surprisingly a number of children less than 2 years of age as well. According to our ophthalmologist from the Desai Eye Hospital who attended to these

children, this was due to the poor pre-natal and post-natal nutrition and vitamin deficiency [6].

Year	Eye Camps	Number Screened	Refractory errors	Cataract	Village Population Covered
2004	3	2117	345	175	38000
2005	1	1300	372	104	20000
2006	10	6925	5.461	173	148000
2007	12	9701	7.432	269	248500
2008	10	6074	5.068	165	179100
2009	17	14241	10.152	145	239600
2010	4	3785	830	86	108000
2011	17	5375	2955	233	417139
Total	53	49518	32615	1350	1398339
Total (%)	-	-	65.86 %	2.73 %	-

Table 2: Stichting Shared Vision-India: Summary Data on all the Eye Camps held from 2004-2011

Discussion

Our data show that visual impairment due to refractory errors is an important public health problem in this part of the country in India. This condition is widely distributed in both children and adults, and it can be readily corrected through an assertive public health initiative.

Most of the people in this area live in remote villages far away from the city. The key factor which limits access to the preventive and curative eye care services in this part of Rajasthan is the lack of trained eye care professionals in the rural part of the State. For example nearly 80% of the population of Western Rajasthan lives in the rural areas, whereas, 95% of the trained professionals - such as the ophthalmologists, optometrists and opticians - work in the city [3].

A multitude of other social and physical barriers discourages villagers from obtaining preventive and curative eye care services such as the inability to pay for cataract surgery and IOL transplant due to poverty, high cost of a pair of new eye glasses, payment of doctor's fee for eye examination and the long distances from village to the city which also requires bus fare that they cannot afford.

As noted above in this survey only 2.7% of the 49'518 people screened were found to have cataracts. In our view - exclusive attention to cataract based blindness prevention program is misguided and is not adequate to deal with the prevention of blindness and visual disability associated with other eye problems [7].

Low vision problem

Visual disability due to the retinal disorder (such as age related macular degeneration) also requires urgent attention. This field may acquire high priority as the life expectancy increases and the pool of elderly with visual disability becomes larger and larger.

Our observation is that the field of low vision is largely ignored by the ophthalmologists in this part of India. Some of the elderly with macular degeneration also have co-existing cataracts. When faced with

such patients, the ophthalmologists opt for cataract surgery and patients end-up with poor outcome in visual improvement. Differential diagnosis of whether it is a wet/or dry form of macular degeneration and current modality of possible treatment for the wet form has not received attention by ophthalmologists in Jodhpur.

To give attention to this field, we have established a well-designed low vision diagnostic & rehabilitation program at our Foundation center in Jodhpur. This is now integrated in our regular “screen & treat” mobile Eye Camps program. But this is insufficient. A more assertive public health initiative is needed.

In trying to set-up a screening program a more disturbing example we have encountered-relates to misclassification of children as blind, when in fact they are of low vision. In a residential blind school in Jodhpur, a Dutch consultant optometrist specializing in the diagnostic assessment of children and adults with low vision gave a diagnostic test to all the children at the blind school. It was discovered that out of a total of 350 children classified as blind, 146 (42%) were not blind at all. They had low vision. Their vision and school performance could be improved through better lighting and assistive devices such magnifying illuminator. The school management, however, has given no attention to this possibility.

The management classifies the children as blind, mainly for two reasons; (I) ignorance on the clinical definition of low vision, and what can be done for vision improvement through assistive devices, and (II) to receive higher government subsidy allocated-per person when a child is classified as blind.

For the same reasons the management of the Government Blind School in Jodhpur refused to allow our consultant optometrist and a local ophthalmologist we contracted for clinical re-assessment of the children under their care. Our complaint to the Divisional Commissioner of Jodhpur on this refusal —led us nowhere because the government blind school falls under the supervision of the State Education Authority. And the Commissioner (Mrs. Kiron Soni-Gupta) had no authority to require compliance!

The problem is that we have not encountered any public health initiative to correct this problem. We have had a number of meetings with District public health officials in Jodhpur asking them to visit Eye Camps and attend the seminars and workshops on blindness prevention organized by our foundation. No one has ever showed up. Complaints to the District collector and the Divisional Commissioner of the area on their absence have not lead to any change of behavior by the public health officers. This would be totally unacceptable in the United States of America.

Program expansion

We plan to expand the scope and sphere of Eye Camp program to the rural areas of all the 6 Districts in Western Rajasthan, with a combined population of nearly 10 million (Table 3).

The diagnostic data collected by our eye care staff on refractory errors, cataract and other eye problems, age and gender distribution and the caste of the individuals who lined-up for screening, show that a large number of tribal and low caste individuals have attended the pilot camps. They are the poorest of the poor in the Rajasthan villages.

As expected, the two leading causes of visual impairment were found to be: the refractory errors (69%) and cataract (3.7%). Refractory errors were widely distributed within all age groups. Whereas cataract was mainly diagnosed in the elderly.

Name of District	Population	Rural Population Percentage	Number of Villages
Jodhpur	286505	67	860
Jaisalmer	508247	84	539
Barmer	1964835	93	670
Jalore	1700000	93	676
Sirohi	851107	60	673
Pali	1820251	78	943
Total	9730945	79% (average)	4,361

Table 3: Urban-Rural Distribution of Population in Western Rajasthan (Population data [3])

To get an empirical measure of the unmet need for eye care services in the population of these outer Districts, we have held six pilot Eye Camps in separate locations of these Districts (Table 4).

Date	Village	Screened	Refractory errors	Cataract
28 Feb	Guda Bishnoi	1068	618	80
13 Apr	Sardar Samand	717	543	30
23 May	Thanwal	1016	814	19
02 Aug	Raipur	1334	965	40
16 Sep	Phalsund	1036	567	22
01 Oct	Nagana Village	555	462	22
Total		5726	3969	213
Total (%)		-	69.32 %	3.72 %

Table 4: 6 MRC EYE Camp Pilot Studies in 2009

Our observations of holding Eye Camps in these outer Districts also show a number of other medical and nutritional deficiency problem that require attention. If we can obtain subsidy from donor organizations in India or abroad---the scope of our program expansion would be enlarged to include the following:

- "Screen and treat" services for deafness and various other common diseases and conditions that are largely preventable though an assertive public health action as defined by the CDC (center for Disease Control) in Atlanta GA. This will include screening for diabetes.
- Maternal and child health program to reduce maternal mortality and infant and neo-natal mortality; nutritional supplements to mothers and children; and provision of contraceptives.
- Refuge for "street children" who roam the streets of Jodhpur-giving them shelter, food and protection from criminals who recruit children for slave labor, and

- Micro-credit for village entrepreneurs

Regular follow-up, through frequent visits to the various locations by skilled personnel - will be part of the service expansion program.

Shared vision foundation

The survey reported here is an initiative of the Shared Vision Foundation. It is a Dutch Foundation, registered as a non-profit NGO in the Netherlands since 2004. Its mission is to provide preventive health care services and community based rehabilitation (CBR) services to people with multiple disabilities living in the remote villages of Western Rajasthan. All funds for its work have come from the Dutch donors. This project is managed by our field staff based in the City of Jodhpur. It is implemented in collaboration with the Blind Peoples Association of India (BPA)-Ahmadabad a nationally respected NGO in India that provides expert support in staff training and organization of rehabilitation services to the visually disabled.

Structure of Management

Our outpost in Jodhpur is a legally registered-non-profit NGO in the State of Rajasthan (Certificate No. 762-2010). It is governed by a Management Committee: a group of un-paid Community leaders who have volunteered to serve as the Board of Directors. The Foundation has a staff of 8 persons in program management and a field staff of 20 people who are stationed in the villages.

Under the leadership of Pramod Kumar Gupta, the Managing Director the staff has established high credibility in service delivery for the disabled people. Examples include giving assistive devices to the physically disabled, such as; a wheel chair, tricycle, crutches, and artificial limbs & hearings aids for the deaf and educational program in computer application for the blind and people with low vision. As stated before; this is all free service to the beneficiaries.

Conclusion

We have touched only the tip of the iceberg. The problem is large and there is much work to be done. The positive part is that the cataract associated blindness can be prevented and the refractory errors can be corrected. For the beneficiaries this makes the difference between darkness and light!

Acknowledgements

The authors would like to acknowledge the management of the BPA-Ahmadabad for an active support the field staff of shared vision foundation, eye-hospitals in Jodhpur, the Dutch donors who have supported this initiative for the past 10 years and the charitable Trust of the Maharaja of Jodhpur in the first five years of Eye Camp organization using their vast contacts in the village population of the Jodhpur District.

References

1. Mohan M (1989) National survey of blindness-India. NPCB-WHO report. New Delhi: Ministry of Health and Family Welfare, Government of India.
2. Murthy GV, Gupta SK, Bachani D, Jose R, John N (2005) Current estimates of blindness in India. *Br J Ophthalmol* 89: 257-260.
3. India National Census 2011. Census of India.
4. Status of Health in Rajasthan (1993) Rajasthan Voluntary Health Association, Jaipur, Rajasthan.
5. Iyengar SD, Iyengar K, Gupta V (2009) Maternal health: a case study of Rajasthan. *J Health Popul Nutr* 27: 271-292.
6. <http://www.sharedvision.nl/index.php/en/>
7. Dandona L, Dandona R, Naduvilath TJ, McCarty CA, Nanda A, et al. (1998) Is current eye-care-policy focus almost exclusively on cataract adequate to deal with blindness in India? *Lancet* 351: 1312-1316.