

## Research Article

# Prevalence of bilateral cataract blindness in persons $\geq 50$ years of age in Pulwama district, Jammu & Kashmir, India

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## ABSTRACT

Rapid assessment of cataract blindness has been accepted as a robust tool to help planners in developing countries. Prevalence of cataract blindness can give important information about the impact of a cataract intervention programme. A study in this direction was carried out in Pulwama district of Jammu & Kashmir. Our results clearly showed that with the increase in age, the prevalence of bilateral cataract blindness increases manifold. However, gender did influence the prevalence of cataract in the present survey. The prevalence of bilateral cataract decreases considerably, with the increase in education of both the genders. Among both male and female respondents examined, 89 percent were having both eyes phakia. Similarly 79 percent of study population were not having lenticular opacity either in R/E or L/E in both males and females. Results show that the prevalence of bilateral cataract blindness in district Pulwama is 4.16 percent.

**Keywords:** Cataract blindness, Persons  $\geq 50$  years of age, Pulwama district (Kashmir valley)

## INTRODUCTION

Cataract was a significant global problem at the beginning of the last century, but not widely recognized as such. The challenge is to deal with it so that it is no longer a problem. Increasing age is associated with an increasing prevalence of cataract. For example, in an Indian study, visually significant cataract occurred 14 years earlier than in a comparable study in the United States. The age-adjusted prevalence of cataract in India was three times that of the US, with 82% of Indians of 50 to 83 years old having visually significant cataract or aphakia, compared to 46% (senile lens changes associated with a visual acuity of 6/9 and worse, (or a history of cataract extraction) of those aged 75 to 85 years in the US.<sup>1,2</sup>

Eye disease has been suggested to start at 40 years of age with an even steeper increase beginning around 60 years

of age.<sup>3</sup> Age-related cataract remains the single major cause of blindness in most developing countries, including India. Declining birth rates and a rapidly increasing life expectancy have led to an increase of the population above 50 years of age. This, combined with the limited capacity to cover the increased demand for cataract surgical services, causes an increase in blindness from age-related cataract. In India 9.5 million people are blind and nearly 57% are due to cataract. To deal with such a vast problem of blindness it is imperative to know its magnitude in order to mobilize resources.<sup>4</sup>

District Blindness Control Societies prepare annual action plans to intensify eye-care services in their districts. Most of the emphasis is on the reduction of cataract blindness. To estimate the need for services and to plan for adequate manpower and logistics, extrapolations are generally made from state-level data. However, prevalence and

causes of blindness are likely to vary considerably among districts due to differences in socio-economic conditions, in age and gender composition of the population  $\geq 50$  years of age, in available resources for surgical services, and in possible risk factors. Therefore, the need to obtain district-level data on the requirements for cataract services and the extent to which the cataract problem is covered became obvious.

The National Survey on Blindness was carried out in 2001-2002 to assess the prevalence of blindness in India. Till now state level data is extrapolated to districts and need for services is based on that. District level survey in our state would provide a realistic estimate of targets. A proper understanding of magnitude of cataract would help in planning for geriatric eye care in the state.

The aim of the study is to assess the prevalence of cataract blindness in the population  $\geq 50$  years of age in district Pulwama. The methodology was designed specifically for implementation by local ophthalmologists and ophthalmic assistants after proper training. This coverage indicator can be used for cataract blind eyes, as

well as persons bilaterally blind from cataract. It gives a good impression about the availability, accessibility and utilisation of cataract surgical services over time.

## METHODS

District Pulwama is located in the South of Kashmir Division with a population of 5,70,060. This gives it a ranking of 535<sup>th</sup> among districts in India out of a total of 640. For the purpose of rapid assessment of cataract blindness 15 villages were selected using purposive sampling. The villages were selected in such a manner that some of them fall far and some fall near District Head Quarter. A total of 1,080 people aged greater than 50 years were examined, out of which 498 were males and 582 females. Response by villages is given in Table 1. Based on the population of villages, majority of respondents (19.5%) were from village Pinglan followed by Muran where 17 percent of total respondents were selected, least percentage of respondents (1.38 %) were from the village Gadhazpora. Random sampling was used to select a cross sectional sample of people  $\geq 50$  years of age living in the fifteen villages.

**Table 1: Village and gender wise distribution of respondents.**

Villages	Male		Female		Count	Total % age
	Count	Row %	Count	Row %		
Muran	101	54.9%	83	45.1%	184	17.03%
Kangan	38	51.4%	36	48.6%	74	6.85%
Wahipora	15	40.5%	22	59.5%	37	3.42%
Pinglan	104	49.3%	107	50.7%	211	19.35%
Bouner	23	37.7%	38	62.3%	61	5.64%
Arihal	49	35.0%	91	65.0%	140	12.96%
Rajmahal	11	52.4%	10	47.6%	21	1.94%
Khanbasti	10	43.5%	13	56.5%	23	2.12%
Kulpora	21	44.7%	26	55.3%	47	4.35%
Ladermud	17	44.7%	21	55.3%	38	3.51%
Bandina	26	52.0%	24	48.0%	50	4.62%
Nownageri	24	51.1%	23	48.9%	47	4.35%
Wahigug	22	32.8%	45	67.2%	67	6.20%
Reshipora	29	44.6%	36	55.4%	65	6.01%
Gadhazpora	6	40.0%	9	60.0%	15	1.38%
<b>Total</b>	<b>496</b>		<b>584</b>		<b>1080</b>	

For the purpose of the study blindness due to cataract is defined as obvious lenticular opacity combined with a visual acuity of <3/60 with available correction or 6/60 (used by NPCB in India). A person is called blind due to cataract if both eyes meet these criteria. This is consistent with the international definition for blindness given by WHO (1979).<sup>5</sup>

**Sampling**

Patients were enumerated through a door to door household survey. A sample size of 1,080 persons was selected for a reasonable estimate of prevalence of cataract blindness in people aged above 50 years in the district where the estimated total population of people as per census 2011 aged greater than or equal to 50 years is 28,000. It was assumed that the national prevalence of blindness as 8.5 percent (2005).<sup>6</sup> Design effect of 1.5 was assumed as the experience from surveys in the past 10 years or so suggest that for estimating prevalence of blindness, or of any other condition which has a fairly uniform distribution in the population, provided that a fairly simple sampling method is to be used. Surveys of rare diseases require larger sample size primarily because large sampling error cannot be accepted thus in our survey it was set as 2 percent.

Three survey teams consisting of Para-medical Ophthalmic Assistants (PMOAs) and one helper were formed who visited 50 patients per day. A frame of people residing in the village who were aged above 50 years was constructed and team examined them till the

number 1,080 was reached. Experienced Para-medical Ophthalmic Assistants (PMOAs) were specially trained for this assignment by the senior eye surgeon of Pulwama district. The ophthalmic examination was limited to the examination of the lens (categories used-obvious opacity, aphakia or pseudophakia, other lens pathology, no lens pathology) and measuring of the visual acuity with the available correction. In this study, cataract blindness was defined as obvious lens opacity, combined with a visual acuity of less than 3/60 in the better eye with the available correction. Data were entered by the PMOAs on the survey forms. All data from the forms were entered in SPSS, (Version 16).

**Demographic profile of respondents**

Demographic profile of respondents is presented in Table 2. For the current study 34.5 percent of the respondents' belonged to age group of 50-55 years, out of these 62.5 percent were females. Almost 26 percent of study population were selected from age group of 55-60 years (46.4 percent males and 53.6 percent females). As the population of persons aged 80 and above is very small, accordingly 1.6 percent of total respondents participated in study. The table also shows that majority 956 persons constituting 88.5 percent of the respondents examined were illiterate and they were mostly (60 percent) females. Very small proportions of female respondents were having higher qualification. All the 582 female respondents, in other words nearly 54 percent of the study sample were housewives. Farmers constituted 24.6 percent of study population.

**Table 2: Age and gender specific prevalence rates.**

Age group	Examined			Bilateral cataract blind				Total	
	Males	Females	Total	Males	Prevalence	Females	Prevalence	Total Male & females	Prevalence
50-55 yrs	140	233	373	0	0.00	1	0.42	1	0.26
56-60 yrs	129	149	278	2	1.55	2	1.34	4	1.44
61-65 yrs	79	87	166	4	5.06	3	3.44	7	4.21
66- 70 yrs	66	62	128	6	9.09	4	6.45	10	7.81
71 - 75 yrs	54	23	77	5	9.25	4	17.39	9	11.68
76 - 80 yrs	23	18	41	6	26.08	2	11.11	8	19.51
above 81 yrs	7	10	17	3	42.85	3	30.00	6	35.29
<b>Total</b>	498	582	1,080	26	5.22	19	3.26	45	4.16

**RESULTS AND DISCUSSION**

The results of prevalence of age, gender and educational status specific bilateral cataract blindness in District Pulwama of Jammu and Kashmir are given in tables 3 & 4. Results show that the prevalence of bilateral cataract blindness in district Pulwama is 4.16 percent. Murthy et al (2005)<sup>7</sup> in a nation-wide survey estimated the prevalence of blindness in the population above 50 years was 8.5%. The prevalence varied from a low of 4.2% to a high of 13.7% across different districts. According to Murthy<sup>7</sup> prevalence of blindness in India in the population of above 50 years (presenting vision <6/60 in better eye) is 8.5%. This shows that Pulwama district of J&K is witnessing much lower bilateral cataract

blindness prevalence than that of the national average and is at par with the districts with low prevalence of blindness. Prevalence is lower in females with prevalence rate of 3.26 percent as against males with 5.22 percent. The results clearly showed that with the increase in age, the prevalence of bilateral cataract blindness increases. Respondents aged 50-55 years had prevalence of 0.26 percent, while those aged >80 years had a prevalence of 35.29 percent. This is clear indication that bilateral cataract blindness increase manifold with the increase in age. However, gender did influence the prevalence of cataract in the present survey. With the increase in age the prevalence of bilateral cataract increases more rapidly in males as compared to females which is in contradiction with other studies.<sup>6,8,9</sup>

**Table 3: Educational status and gender specific prevalence rates.**

Qualification	Examined			Bilateral cataract blind				Total	
	Males	Females	Total	Males	Prevalence	Females	Prevalence	Total	Prevalence
Illiterate	385	570	955	23	5.97	19	3.33	42	4.39
Primary level	11	03	14	01	9.09	00	00	01	7.14
Middle level	33	04	37	01	3.03	00	00	01	2.70
Matric	47	02	49	01	2.12	00	00	01	2.04
Higher secondary	08	01	09	00	00	00	00	00	00
Graduation	10	02	12	00	00	00	00	00	00
Post-graduation	4	00	04	00	00	00	00	00	00
<b>Total</b>	<b>498</b>	<b>582</b>	<b>1,080</b>	<b>26</b>	<b>5.22</b>	<b>19</b>	<b>3.26</b>	<b>45</b>	<b>4.16</b>

**Table 4: Cataract surgical coverage in medical block Pulwama.**

	Total	Males	Females
Cataract blind eyes	214	116	98
cataract blind person	45	26	19
Total operated eyes	186	91	95
Person with single eye operated	45	18	27
Person with both eyes operated	70	36	34
Cataract surgical coverage eyes	46.50%	43.96%	49.22%
Cataract surgical coverage (cataract blind person)	71.87%	67.50%	76.25%

The prevalence of bilateral cataract decrease considerably, with the increase in qualification of both the genders. Our results are in accordance with Woldeyes & Adamu (2011).<sup>9</sup> The prevalence is higher in the respondents who are either illiterate or have primary level qualification i.e. 4.39 % & 7.14% respectively. However, prevalence shows a rapid decline with the increase educational qualification.

The respondents were examined for phakia, psedophakia and Aphakia in both eyes. The results are presented in tables 5 & 6. Among both male and female respondents examined 89 percent were having both eyes phakia. In case of males 4.23 percent respondents were having both eyes aphakia, this percentage was slightly lower in females (2.56 percent).

**Table 5: Gender wise distribution of phakic, psedophakic and aphakic eyes examined.**

Examined	Total Phakic eyes	Total Psedophakic eyes	Total Aphakia eyes	Total
Males	897	49	44	990
Females	1067	66	30	1163
<b>Total</b>	1964	115	74	2153

Respondents were also examined for lenticular opacity and fundus visibility and the results are presented in tables 7 & 8. Approximately 79 percent of study population were not having any lenticular opacity either in R/E or L/E in both males and females. Slightly higher percentage of males was having lenticular opacity as compared to females. The fundus was visible in almost 90 percent of study population examined.

**Table 6: Gender wise examination of phakic, psedophakic, aphakic, lenticular opacity and fundus visibility.**

	Total	Males	Females
Cataract blind eyes	214	116	98
cataract blind person	45	26	19
Total operated eyes	186	91	95
Person with single eye operated	45	18	27
Person with both eyes operated	70	36	34
Cataract surgical coverage eyes	46.50%	43.96%	49.22%
Cataract surgical coverage (cataract blind person)	71.87%	67.50%	76.25%

**Table 7: Gender wise distribution of lenticular opacity and fundus visibility.**

		Sex				Total	
		Male		Female		Count	Col %
		Count	Col %	Count	Col %		
Lenticular opacity R/E	Yes	110	22.2%	105	18.0%	215	19.9%
	No	385	77.6%	475	81.3%	860	79.6%
	One eyed	1	0.2%	4	0.7%	5	0.5%
Lenticular opacity L/E	Yes	113	22.8%	115	19.7%	228	21.1%
	No	382	77.0%	468	80.1%	850	78.7%
	One eyed	1	0.2%	1	0.2%	2	0.2%
Fundus visibility R/E	Yes	441	88.9%	538	92.4%	979	90.8%
	No	54	10.9%	40	6.9%	94	8.7%
	One eyed	1	0.2%	4	.7%	5	0.5%
Fundus visibility L/E	Yes	441	88.9%	530	91.1%	971	90.1%
	No	54	10.9%	51	8.8%	105	9.7%
	One eyed	1	0.2%	1	.2%	2	0.2%

From the data obtained through this rapid assessment we can also calculate the cataract surgical coverage. This indicator measures what proportion of the total problem of cataract blindness has been covered by services in the form of cataract surgery, irrespective of the outcome. However, the present study cannot measure the extent to

which cataract surgical output has contributed to the reduced prevalence of cataract blindness in the district. A part of the change in cataract blindness can be attributed to secular trends, better availability of services, improved socioeconomic conditions etc. The prevalence of cataract is only 4.16 in district Pulwama, which is approximately 50% less than that shown in India.

**Table 8: Gender wise distribution of lenticular opacity and fundus visibility.**

		sex				total	
		Male		Female		Count	Col %
		Count	Col %	Count	Col %		
Lenticular opacity R/E	Yes	110	22.2%	105	18.0%	215	19.9%
	No	385	77.6%	475	81.3%	860	79.6%
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	No	382	77.0%	468	80.1%	850	78.7%
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Fundus visibility L/E	Yes	441	88.9%	530	91.1%	971	90.1%
	No	54	10.9%	51	8.8%	105	9.7%
	One eyed	1	0.2%	1	.2%	2	0.2%

This study also shows that this district has been able to arrest the increasing prevalence of blindness. Elimination of blindness is a real possibility and meticulous planning and implementation can bear fruit. It also shows the success of public health interventions.<sup>7</sup> The targets of cataract surgery are set keeping in view the prevalence of 8.5. As the prevalence of cataract is 4.16 in district Pulwama, the target of cataract surgery rate must be reviewed and set according to the prevalence rate of 4.16.

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