



Human Cataract Prevalence in the Non-Coastal Southern Districts of Kerala State

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ABSTRACT.

A six year study was undertaken to compare the prevalence of cataract in Kottayam and Pathanamthitta districts of Kerala state, India. Hospital based study was conducted from April 2005 to March 2011 to find out the cataract prevalence among the total population, gender prevalence and prevalence in different age groups. The data was collected from registers of ophthalmology department of district hospitals and two private hospitals in Pathanamthitta and Kottayam district and from Directorate of Health, Thiruvananthapuram. Cataract prevalence among the total population in Kottayam district was significantly increased from 0.34% to 0.51% ($p=0.000157$), but in Pathanamthitta district prevalence significantly decreased from 0.40 % to 0.36% ($p=0.0024$). Gender prevalence is significantly higher in females in Kottayam (61.6%, 0.0000326) as well as in Pathanamthitta (59%, 0.00014) than in males, suggest that females have more cataract. A significantly highest prevalence recorded in the age group of 71-80 years in Kottayam (36.6%, 0.000072) and Pathanamthitta (33.6%, 0.000312) as compared with all other age groups. Prevalence of congenital cataract (0-15) is very less in Kottayam (1.2%) and Pathanamthitta(0.9%). The population decrease is found to be the main reason for decrease in the prevalence rate in Pathanamthitta district. Cataract blindness in Kerala can be effectively controlled only if effective strategies are developed to reduce the incidence of blinding cataract. The present study of cataract prevalence in the state of Kerala may to some extent throw light on the gravity of cataract incidence in the state of Kerala.

Key words: cataract, prevalence, districts.

INTRODUCTION

According to World Health Organization's (2011) global estimate, there are 285 million people worldwide who are visually disabled, of whom 246 million have low vision and 39 million are blind, and the number is steadily increasing because of population growth and aging [1]The burden of blind is more in remote rural community of developing countries. With three out of every four Indians residing in the rural areas, there is a concentration of blindness in agriculture dependent communities in India. Sperduto reported that each of the 3 types of senile lens opacities was found more often in women than in men. Blindness is not only a medical and personal problem, it is also a socioeconomic issue for the individual and the community [2].

A national eye survey was conducted in 1996 among the Malaysian population of all ages, prevalence of bilateral blindness and low vision was 0.29% and 2.44% respectively. Females had a higher age adjusted prevalence of low vision compared to males [3]. The prevalence of visual impairment of children in China is 1.1 per 1000 and blindness and the prevalence is 0.33 per thousand and is close the level of developed country [4] . Blindness due to cataract in India is estimated to have a prevalence of 0.8-1% [5,6] causing 62% of bilateral blindness in persons aged 50 years or more [5,7].The main causes of low vision and blindness in this Brazilian city were uncorrected refractive errors, cataract, and retinal diseases. Programs to further reduce the burden of visual impairment need to be targeted toward

the correction of refractive error and surgery for cataracts [8].

PATIENTS AND METHODOLOGY

Pathanamthitta is the youngest district in Kerala. It was formed in the year of 1982. Pathanamthitta occupies an area 2,642 sq. km. The total population of this district according to 2011 census is 11,95,537, out of which 5,61,620 are male and 6,33,917 are female. The density of population in Pathanamthitta is 453 per square kilometers. The district of Kottayam in Kerala is economically very important. The total area of Kottayam is 2,208 sq. km. It has a total population of 19,79,384. The number of male is 9,70,140 compared to 10,09,244 the number of female. The density of population in Kottayam is 896 people per square kilometer

This study was conducted among the patients visiting the ophthalmic clinics of Kottayam and Pathanamthitta districts. The period of study was from April 2005- March 2011 ie, about the six financial years. As per the statistics department (Registrar General), the census of Kerala for the year 2001, 2011 and percentage decadal growth of the population were used in the estimation of cataract prevalence. This study mainly focused on prevalence among the total population, gender prevalence, prevalence in different age groups. Significance of cataract prevalence was analysed using MATLAB and SPSS statistical package [9].

RESULTS

Cataract prevalence among the total population increased in Kottayam district, but prevalence decreased in Pathanamthitta district within six years. The prevalence increased significantly in Kottayam from 0.34% to 0.51% ($p=0.000157$) but decreased significantly in Pathanamthitta from 0.40 % to 0.36 % ($p=0.0024$). Prevalence per 10,000 population is changed from 39.57 to 35.98 in Pathanamthitta and 33.66 to 51.28 (Table-1) in Kottayam within six years. The study was carried out on 7,800 patients admitted between April 2005 to March 2011 in the eye ward at district hospital and two private hospitals in Pathanamthitta district (Table-2) and the highest age recorded is 92 years.. Case history of 8,484 patients were collected from the operation registers of different hospitals in Kottayam district and the highest age recorded was 97 years. Gender prevalence was significantly higher among females in Kottayam (61.6%, $p=0.0000326$) and Pathanamthitta (59%, $p=0.00014$) than males. Prevalence were highest in the age group of 71-80 in Kottayam (36.6%, $p=0.000072$) and Pathanamthitta (33.6%, $p=0.000312$) districts. Congenital cataract was 1.2% in Kottayam and 0.9% in Pathanamthitta (Table-3). The prevalence rate started increasing significantly from 51 to 80 years of age and the prevalence of all the other age groups were not significant. Prevalence was very less in 91-100 years of age.

DISCUSSION & CONCLUSION

In the present study, human cataract prevalence is significantly increased in Kottayam district but

significantly decreased in Pathanamthitta district within six years (2005-11). The population rate is increased in Kottayam and the cataract prevalence rate is also increased but in Pathanamthitta the population rate is decreased and the prevalence rate is also decreased. From this we came to the conclusion that population growth may be the main reason for increasing the cataract prevalence than population aging. In Shandong Province of China, prevalence of binocular blindness was 0.34%, that of unilateral blindness 0.65%, [10]. A statistical analysis of a national sample survey of blindness and low vision was carried out over China calculated in the whole population, the prevalence being 0.46% [11].

Saman Wimalasundera, 2008 reported that total prevalence of surgical cataract in Galle District of Sri Lanka is 0.32% [12]. There were an estimated 9 million blind people [5,13] and 32 million moderately visually impaired due to cataract in 2000 [5,14] compared with other developed countries. India is a country in demographic transition and cataract occurs at a much earlier age in India [5]. Indian population will get older, and consequently, the prevalence of cataract will increase further [15]. Dandona et al., [14] reported that if there was no change in the current trend of blindness, the number of blind persons would increase to 24.1 million in 2010 and to 31.6 million in 2020. The high rate of cataract blindness in India and the aging population trend, which is expected substantially to increase new cases of blindness from cataract is a clear indication that the cataract blindness in India is

too massive to be solved by the surgical programme alone. Cataract blindness in India can be effectively controlled only if effective strategies are developed to reduce the incidence of blinding cataract. A global initiative for the elimination of avoidable blindness under the title “VISION 2020: The Right to Sight” was launched in 1999 by the World Health Organization in collaboration with a number of international nongovernmental organization was positive step to control the problem[16].

This study shows that gender prevalence is significantly higher in females (61.6%) than in males. This suggests that females are more cataract patients. According to Boyle & Altersiz, 2008[17] women have a significantly higher prevalence than men, and nuclear cataract is the most common type. It has been shown in Australian Blue Mountain study [18,19] that females gender is generally associated with increased age adjusted risk of cataract. Significant risk factors were age, being female, occupational exposure, lower social class, presence of chronic illnesses and smoking [20].

The women who started menstruating late are at an even higher risk [21]. In the higher age groups, women tend to suffer from cataract more than do males. This appears to be true particularly in western countries , it is worth recalling that at least in the U.S.A., women above about 50 years of age have significantly high blood sugar level than men [22]. Other suggestive epidemiological correlations are found to exist . Women are almost 40 percent more likely to develop cataract than men. Women who get more lutein, zeaxanthin and

vitamin E are less likely to develop cataract than women who skip on those nutrients [23]. Most of the studies have shown that cataracts are most prevalent in females than in males [24,25]. In another study from South East Asia, [26] found that the prevalence of all types of lens opacities was higher in females than in males. In yet another demographic study on nutritional supplements and other factors that influence lens opacities in West Indies,[27] reported that women had an increased risk of cortical opacities. The view that cataracts were more prevalent in females was again supported by findings of other workers [28,29,30,31,32].

In Pathanamthitta and Kottayam significantly highest prevalence recorded in the age group of 71-80 years compared with other all age groups can be seen in this study. According to Venkata, et al.,[7] those aged 70 and above had a five times higher risk of being blind compared to those aged 50-59 years . A study [33] amongst individuals aged more than 40 years in the Maharashtra (India) demonstrated that cataract prevalence increased with age; it was just 0.4% in age group of 40-44 years and 24.9% in the age group of 70 years and above . Another study[34] from seven high blindness prevalence states showed an overall 43.3% prevalence of cataract amongst 50 years and older individuals demonstrated that cataract prevalence was 25.5% among individuals aged 50-59 years and 63% among those age 70 years and above. In adults the study showed that the number of cataract patients increased with age and cataract were more prevalent after 50 years. In a population-based study of lens opacities, the

proportion of population who have undergone cataract surgery has a marked increase in the decades after 40 yrs [26]. Sudden increase of

cataract prevalence after 50 years is higher and all the opacifications increased with age. The changes were expected as a part of aging

Table 1- Human cataract prevalence among the whole population in PTA &KTM districts

Financial years	Pathanamthitta				Kottayam			
	population	cataract		Pvalue& remarks	population	cataract		P value& remarks
		number	prevalence %			number	prevalence %	
2005-06	1214766	4807	0.4		1966540	6620	0.34	
2006-07	1210916	4749	0.39		1969119	6385	0.32	
2007-08	1207066	4478	0.37		1971698	6261	0.32	
2008-09	1203216	4793	0.4		1974277	7639	0.39	
2009-10	1199366	4959	0.41	0.06	1976855	8202	0.41	0.002*
2010-11	1195537	4302	0.36	0.0024*	1979384	10151	0.51	0.000157* *

* Significant, ** highly significant

Table.2- Gender prevalence from three hospital based study in PTA and KTM districts

gender	Pathanamthitta			Kottayam		
	Cataract no.	prevalence%	P value & remarks	Cataract no.	prevalence %	P value& remarks
male	3198	41		3258	38.4	
female	4602	59	0.00014**	5226	61.6	0.0000326**
total	7800	100		8484	100	

** - highly significant

Table.3- Prevalence of human cataract in the different age groups in PTA & KTM districts on the basis of data's from 3 hospitals in each districts

Age groups	Pathanamthitta			Kottayam		
	Cataract no.	prevalence%	P value & remarks	Cataract no.	prevalence %	P value & remarks
0-15	69	0.9	0.63	100	1.2	0.08
16-40	156	2	0.10	210	2.5	0.07
41-50	405	5.2	0.08	400	4.7	0.06
51-60	1345	17.2	0.022 *	1044	12.3	0.0311*
61-70	2568	32.9	0.00044**	2650	31.2	0.000021**
71-80	2618	33.6	0.00031**	3106	36.6	0.000072**
81-90	610	7.8	0.06	907	10.7	0.06
90-100	29	0.4	0.42	67	0.8	0.10
total	7800	100		8484	100	

* Significant ** highly significant

PROCESS

This study has demonstrated that cataract affects all the age groups but adults are affected more than children

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