PREVALENCE OF HUMAN CATARACT IN KOLLAM DISTRICT OF KERALA STATE OF INDIA

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ABSTRACT

Aim

Hospital based study from April 2005 to March 2011 conducted among the population to determine the prevalence of cataract in Kollam district of Kerala state of India.

Methodology

The data’s collected from registers of ophthalmology department of district hospital and two private hospitals in Kollam district to access the gender prevalence and prevalence of different age groups. The total number of cataract operation carried out in Kollam district was collected from Directorate of Health, Thiruvananthapuram to evaluate the prevalence among the total population. Significance of cataract prevalence was analysed using MATLAB and SPSS statistical package

Results

Cataract prevalence in Kollam district was significantly increased from 0.24% to 0.44% (p=0.0001). Gender prevalence is significantly higher in females (58.2%, 0.000214) than in males, suggest that more cataract patients are females. A significantly highest prevalence recorded in the age group of 61-70 (31.4%, 0.00005) years as compared with other age group between 0-100 years.

Conclusions

The present studies of cataract prevalence in Kollam district may to some extend throw light on the gravity of cataract incidence in Kerala state. The present study has shown that Kerala has been able to arrest the increasing prevalence of blindness by improving the general health conditions of individuals and by decreasing the population growth. Cataract blindness in Kerala can be effectively controlled only if effective strategies are developed to reduce the incidence of blinding cataract.

KEYWORDS: Human Cataract, Prevalence, Kollam

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]. Million's of cataract extractions are caring out each year in India. In spite of this huge effort, evidence from recent prevalence data suggests that cataract blindness is increasing [2]. (survey conducted by the National Blindness Prevention and Control Programme, WHO). Cataract blindness in India is too massive to be solved by the surgical programme alone, particularly in view of the aging population trend which is expected substantially to increase the number of new cases of blindness from cataract [3].
Cataract is a public health problem in many developing countries including India. Traditionally, the cataract intervention programme is evaluated by the number of cataract operation performed per year. It is estimated that there are about 12 million blind people due to cataract in India alone [4]. Blindness is not only a medical and personal problem, it is also a socioeconomic issue for the individual and the community. Cataract is the leading cause of blindness worldwide, and any means of delaying or preventing its onset would have enormous social and economic benefits.

The prevalence of blindness in people ≥50 years in Cape Town, South Africa was lower than expected probably because of high cataract surgery coverage [5]. The total prevalence of surgical cataract in Galle District of Sri Lanka is 0.32% [6]. Women have a significantly higher prevalence than men and nuclear cataract is the most common type. High prevalence of cataract continues in India [7]. Blinding eye diseases are highly prevalent in many developing countries, where the prevalence of blindness has been estimated to be 10 to 40 times higher than in industrialized countries. And most are found in the developing countries of Africa, Asia and Latin America. About 75% of this blindness is avoidable, i.e. it is either treatable or preventable [8].

PATIENTS AND METHODOLOGY

This research is an epidemiological descriptive study of Kollam districts of Kerala state of India. Study mainly focused on prevalence, gender prevalence and prevalence in different age groups. Kollam is located in the South west coast of Kerala. It is an old sea port of the Arabian sea coast. Kollam occupies an area of 2,491 sq. km. According to the census of 2011, the total population of the district is 26,29,703 with the population density of 1056 people per square kilometer. The number of females is 13,84,888 as compared to 12,44,815 males. To calculate the prevalence among the total population, the total number of cataract performed in Kollam district in these six years (April 2005 - March 2011) were collected from the Directorate of Health, Thiruvananthapuram. The data’s collected from registers of Ophthalmology department of district hospital and two private hospitals in Kollam district used to calculate the gender prevalence and prevalence in the different age groups. The age is grouped in to eight categories, 0-15, 16-40, 41-50, 51-60, 61-70, 71-80, 81-90 and 91-100. The census of Kerala for the years 2001, 2011 and percentage of decadal growth of the population collected from the statistical department, Thiruvananthapuram was used for the population based epidemiological study. Significance of cataract prevalence was analysed using MATLAB and SPSS statistical package [9]

RESULTS

Prevalence among the Total Population

In Kollam district 6,225 cataract patients were treated in the financial year 2005-06 and it shows a prevalence of 0.24% and the number of patients increased to 7564, 8405, 8559 and 8771 in the next four financial years with prevalence of 0.29%, 0.32%, 0.33% and 0.33% (p=0.002) respectively as shown in the table-1. There was a gradual increase in every year starting from 0.24% (2005-2006) and reached a very high significant rate in the year 2010-2011 i.e 0.44% (n=11,540, p= 0.00015). Prevalence of cataract increased from 23.87 to 43.88 per 10,000 populations.

Gender Prevalence

In this study a total of seven thousand four hundred and forty entries on cataract surgeries were collected from 2005 to 2011 were analysed for gender prevalence, the year-vice total was 1244, 1316, 1169, 1240, 1216 and 1263 in the consecutive years as shown in the table-2. Among this 3,113 were males and 4,335 were females with a percentage of 41.8 and 58.2 respectively (graph-2a&b). Female gender has shown a highly significant (p=0.000214) increase in the cataract prevalence in Kollam district.
Prevalence in Different Age Groups

In Kollam district 7,448 patients case history were recorded to analyse the prevalence of cataract in different age groups. The highest age recorded in this district is 93 years. Very less prevalence observed in the age group 91-100 ie. 0.3%. The prevalence of cataract was significantly (p=0.00005) higher in the age group of 61-70 (31.4%). The congenital cataract was 4.3% (table-3). The prevalence remarkably increased in the age from 51 and above to 80 (77.3%) and the prevalence of all the other age groups are not significant. A great decrease observed in the age group 81-100 (figure 3). The high onset of cataract prevalence was in the age group of 61-70 in this coastal district.

DISCUSSIONS & CONCLUSIONS

Cataract prevalence in Kollam district was significantly increased from 2005 to 2011. Blindness due to cataract in India is estimated to have a prevalence of 0.8-1% [10][11] causing 62% of bilateral blindness in persons aged 50 years or more [10][12]. There were an estimated 9 million blind people [10][13] and 32 million moderately visually impaired due to cataract in 2000[10] [14] compared with other countries, especially those that are developed, cataract occurs at a much earlier age in India [10]. India is a country in demographic transition. Its population will get older, and consequently, the prevalence of cataract will increase further [15]. Dandona et al., (2002) 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[14]. The high rate of cataract blindness in Kollam 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 Kerala 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.

In Handan, China, there are a sizeable number of persons with poor vision due to cataract, who have not had cataract surgery despite demonstrated positive outcomes. These subjects not operated on tended to be of older age and women, reflecting inequities within the delivery of health care in the rural Chinese setting [16]. In Shandong Province, prevalence of binocular blindness was 0.34%, that of unilateral blindness 0.65% [17]. 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% [18].

This study shows that gender prevalence is significantly higher in females (58.2%) than in males, suggest that females are more likely to be operated on for cataract. According to Boyle & Altersitz (2008), women have a significantly higher prevalence than men, and nuclear cataract is the most common type [7]. It has been shown in Australian Blue Mountain study [19][20] that females gender is generally associated with increased age adjusted risk of cataract and the findings of the study is also similar to the Australian Study.

In the higher age groups, women tend to suffer from cataract more than do males. This appears to be true particularly in western countries [21]; in view of the well known difficulties of distinguishing between senile and diabetic cataract, it is worth recalling that at least in the U.S.A., women have significantly high blood sugar level than men (above about 50 years of age). 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 [22]. Most of the studies have shown that cataracts are most prevalent in females than in males [23][24]. In another study from South East Asia, Xu et al., 1996 found that the prevalence of all types of lens opacities was higher in females than in males[25]. In yet another demographic study on nutritional supplements and other factors that influence lens opacities in West Indies, Leske et al (1997) reported that women had an
increased risk of cortical opacities [26]. The view that cataracts were more prevalent in females was again supported by findings of other workers [27][28][29][30][31].

A significantly highest prevalence recorded in the age group of 61-70 years compared with other age group studied. According to Venkata, et al., 2005, those aged 70 and above had a five times a higher risk of being blind compared to those aged 50-59 years [12]. A study (Bachani et al., 2000) 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 [32]

Prevalence of congenital cataract (0-15) in Kollam district is less. According to Fu p. et al (2004), prevalence of visual impairment of children in China is 1.1 per 1000 and the prevalence is 0.33 per thousand and it is close the level of developed country Childhood blindness is one of the priorities in vision 2020: the sight to sight [33]. It is estimated that there are 1.4 million blind children in the world, two third of whom lives in the developing countries[34][2] and that the cause of blindness in children vary according to region and socioeconomic development[2][35]. The prevalence of blindness in children is much lower than in adult. The definition of blindness used in India [11], obtained as a part of two population based study in the Indian state of Andhra Pradesh.

Blindness has been recognized as an important public health problem in India, a country that is now home to a billion Inhabitants. India was the first country in the world to launch a 100% public funded programme for the control of blindness [36].

Overall the survey indicates a very high prevalence of human cataract in Kollam district. The high rate of cataract blindness in Kollam, 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 Kerala is too massive to be solved by the surgical programme alone. Cataract blindness in Kerala as well as in India can be effectively controlled only if effective strategies are developed to reduce the incidence of blinding cataract.

REFERENCES


**APPENDICES**

**Table 1: Prevalence of Cataract among the Total Population in Kollam District**

| Financial Years | Population | Cataract | | |
|-----------------|------------|----------|-----|-----|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| 2005-2006       | 26,07,441  | 6,225    | 0.24| 23.87|     |     |     |     |     |     |
| 2006-2007       | 26,11,887  | 7,564    | 0.29| 28.96|     |     |     |     |     |     |
| 2007-2008       | 26,16,334  | 8,305    | 0.32| 31.74|     |     |     |     |     |     |
| 2008-2009       | 26,20,780  | 8,559    | 0.33| 32.66|     |     |     |     |     |     |
| 2009-2010       | 26,25,227  | 8,771    | 0.33| 33.41|     |     |     |     |     |     |
| 2010-2011       | 26,29,703  | 11,540   | 0.44| 43.88|     |     |     |     |     |     |

* significant ** highly significant

**Figure 1: Cataract Prevalence in Kollam District**
Table 2: Gender Distribution & Prevalence Percentage in Kollam District

<table>
<thead>
<tr>
<th>Sex</th>
<th>Financial Years</th>
<th>2005-06</th>
<th>2006-07</th>
<th>2007-08</th>
<th>2008-09</th>
<th>2009-10</th>
<th>2010-11</th>
<th>Total</th>
<th>Prevalence (%)</th>
<th>P Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>2005-06</td>
<td>526</td>
<td>480</td>
<td>510</td>
<td>516</td>
<td>553</td>
<td>528</td>
<td>3,113</td>
<td>41.8</td>
<td>0.000214**</td>
</tr>
<tr>
<td>Female</td>
<td>2005-06</td>
<td>718</td>
<td>836</td>
<td>659</td>
<td>724</td>
<td>663</td>
<td>735</td>
<td>4,335</td>
<td>58.2</td>
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</tr>
<tr>
<td>Total</td>
<td>2005-06</td>
<td>1,244</td>
<td>1,316</td>
<td>1,169</td>
<td>1,240</td>
<td>1,216</td>
<td>1,263</td>
<td>7,448</td>
<td>100</td>
<td></td>
</tr>
</tbody>
</table>

** highly significant

Figure 2a: Gender Prevalence in Kollam District

Figure 2b: Percentage of Gender Prevalence in Kollam District

Table 3: Age Distribution & Prevalence of Cataract Patients in Kollam Districts

<table>
<thead>
<tr>
<th></th>
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<tbody>
<tr>
<td>0-15</td>
<td>2005-06</td>
<td>44</td>
<td>48</td>
<td>62</td>
<td>60</td>
<td>51</td>
<td>54</td>
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<tr>
<td>16-40</td>
<td>2005-06</td>
<td>84</td>
<td>92</td>
<td>80</td>
<td>72</td>
<td>73</td>
<td>82</td>
<td>483</td>
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<tr>
<td>41-50</td>
<td>2005-06</td>
<td>91</td>
<td>95</td>
<td>97</td>
<td>81</td>
<td>99</td>
<td>95</td>
<td>558</td>
<td>7.5</td>
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<tr>
<td>51-60</td>
<td>2005-06</td>
<td>305</td>
<td>322</td>
<td>238</td>
<td>288</td>
<td>248</td>
<td>287</td>
<td>1,688</td>
<td>22.7</td>
<td>0.0009 **</td>
</tr>
<tr>
<td>61-70</td>
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<td>381</td>
<td>412</td>
<td>353</td>
<td>395</td>
<td>403</td>
<td>396</td>
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</tr>
<tr>
<td>71-80</td>
<td>2005-06</td>
<td>288</td>
<td>294</td>
<td>273</td>
<td>297</td>
<td>286</td>
<td>293</td>
<td>1,731</td>
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<tr>
<td>81-90</td>
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<td>64</td>
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<td>52</td>
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<td>91-100</td>
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<td>6</td>
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</tr>
<tr>
<td>Total</td>
<td>2005-06</td>
<td>1,244</td>
<td>1,316</td>
<td>1,169</td>
<td>1,240</td>
<td>1,216</td>
<td>1,263</td>
<td>7,448</td>
<td>100</td>
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</tr>
</tbody>
</table>

* significant ** highly significant
Figure 3: Cataract Distribution in the Different Age Groups in Kollam District