



**ORIGINAL RESEARCH PAPER**

**Community Medicine**

**PREVALENCE OF GLAUCOMA AMONG KANYAKUMARI POPULATION**

**KEY WORDS:** glaucoma, prevalence, age, primary.

<b>DR.KISHORE KUMAR JACOB</b>	Associate Professor, Department of Ophthalmology, Sree Mookambika Institute of Medical Sciences, Kulasekaram, Kanyakumari District, Tamilnadu.
<b>DR.PRASHANT V SOLANKE</b>	Professor, Department Of Community Medicine, Sree Mookambika Institute Of Medical Sciences, Kulasekaram, Kanyakumari District, Tamilnadu.
<b>DR.N.RAJENDRAN</b>	Professor, Department Of Ophthalmology, Sree Mookambika Institute Of Medical Sciences, Kulasekaram, Kanyakumari District, Tamilnadu.
<b>DR.PS.INDRAPAL</b>	Professor, Department Of Ophthalmology, Sree Mookambika Institute Of Medical Sciences, Kulasekaram, Kanyakumari District, Tamilnadu.
<b>DR A.VINOLIN MARIA SEBASTINA</b>	CRRI, Department Of Community Medicine, Sree Mookambika Institute Of Medical Sciences, Kulasekaram, Kanyakumari District, Tamilnadu.
<b>DR. N.VIGNESH</b>	CRRI, Department Of Community Medicine, Sree Mookambika Institute Of Medical Sciences, Kulasekaram, Kanyakumari District, Tamilnadu.

**ABSTRACT**

**BACKGROUND:** Glaucoma is the leading cause of global irreversible blindness. Estimated number of glaucoma cases worldwide in the year 2013 is, 64.3million. Glaucoma is more prevalent in females than males. Affected males to females ratio is 1:3. Glaucoma is more prevalent in urban population than the rural community. There found to be a strong relationship between primary angle open glaucoma and myopia More than 1/5<sup>th</sup> of the population aged >80 yrs are detected to be ocular hypertensives. Primary angle open glaucoma is double the times commoner than angle closure glaucoma.

**OBJECTIVES:** To study the Glaucoma distribution, types, Prevalence of primary and secondary glaucoma, Prevalence of complications

**METHODOLOGY:** Study design was Cross section. Study period was from June-2016 to March-2017. Study was conducted at RHTC, Marappadi and UHC, Peruvazhikadavu. Sample size was (4PQ/d<sup>2</sup>) 182. Sampling was done by systematic and random sampling technique.

**RESULT:** Prevalence of glaucoma-2.35%, glaucoma among males-2.01%, glaucoma among females-2.67%, PAOG and PACG-2.48%,1.12% respectively, glaucoma less than 45yrs of age - 0.5%, more than 80yrs of age -17.7%, PAOG and PACG-:3.85%,1.48% in rural population and 4.73%,2.24% in urban population respectively, myopia among glaucoma cases-13.2%

**CONCLUSION:** Prevalence of glaucoma rises as the age advances. Females are more likely to be affected than males. Glaucoma is more prevalent in urban population than rural population. More than 10% of glaucoma patients have myopic vision. Angle open glaucoma is more prevalent than angle closure glaucoma.

**INTRODUCTION:**

Glaucoma is the leading cause of global irreversible blindness. Estimated number of glaucoma cases worldwide in the year 2013 is, 64.3million. Glaucoma cases all over the world projected in the year 2020 is, 76 million and in 2040 is 111.8 million<sup>1</sup>. Glaucoma is more prevalent in females than males. Affected males to females ratio is 1:3<sup>2</sup>. Some studies are showing a higher prevalence rate in males than females. Surprisingly, glaucoma is more prevalent in urban population than the rural community<sup>3</sup>. There found to be a strong relationship between primary angle open glaucoma and myopia. Among glaucoma cases about 1/6<sup>th</sup> patients are found to have myopic vision<sup>4</sup>. As the age rises the incidence and prevalence rate of glaucoma are also on the rise. More than 1/5<sup>th</sup> of the population aged >80 yrs are detected to be ocular hypertensives<sup>5</sup>. Rate of congenital glaucoma is much lower among general population and Pseudo exfoliation glaucoma is not an uncommon finding in general community<sup>6,7</sup>. Primary angle open glaucoma is double the times commoner than angle closure glaucoma<sup>8</sup>. Secondary glaucoma and younger onset glaucoma has a prevalence rate of 0.5% each among general population<sup>9</sup>. Glaucoma remains as the second leading cause of blindness worldwide and proper examination and treatment could prevent it<sup>10</sup>.

**OBJECTIVES:**

To study the,  
1. Glaucoma distribution and types.

2. Prevalence of primary and secondary glaucoma.
3. Prevalence of complications.

**METHODOLOGY:**

Study design: Cross section. Study period was from June-2016 to March-2017. Study was conducted at Rural Health and Training Centre, Marappadi and Urban Health Centre, Peruvazhikadavu. Sample size was (4PQ/d<sup>2</sup>) 182. Inclusion criteria: people residing at RHTC, Marappadi and UHC, Peruvazhikadavu areas. Exclusion criteria: those who are not willing. Sampling was done by systematic and random sampling technique. Data was entered in Microsoft excel version 2016 and statistical analysis was done using SPSS trial version 21c. Institutional Ethical Committee clearance was obtained.

**RESULT:**

1. Prevalence of glaucoma: 2.35%
2. Glaucoma among males: 2.01%
3. Glaucoma among females: 2.67%
4. Glaucoma - Age Distribution:
  - 55 - 59 yrs : 1.33%
  - 60 - 69 yrs : 5.1%
  - 70 yrs and above : 14.63%
5. Prevalence of Secondary Glaucoma: 0.37%
6. Major Types of Glaucoma:
  - PAOG : 2.48%
  - PACG : 1.12%

7. Glaucomatous Blindness: 7.1%
8. % Of Pseudo exfoliation among Glaucoma Cases: 4.75%
9. Prevalence of Congenital Glaucoma: 0.02%
10. Prevalence of Younger Onset Glaucoma (less than 45yrs): 0.5%
11. Prevalence of Glaucoma in Elderly (more than 80yrs): 17.7%
12. PACG – Age Distribution:
  - 40–49 yrs : 0.3%
  - 50–59 yrs : 0.8%
  - 60–69 yrs : 1.1%
  - Above 70 yrs : 1.5%
13. PAOG – Age Distribution:
  - 40–49 yrs : 0.9%
  - 50–59 yrs : 1.9%
  - 60–69 yrs : 2.9%
  - Above 70 yrs : 4.0%
14. Prevalence of Glaucoma in Rural Population:
  - PAOG : 3.9%
  - PACG : 1.5%
15. Prevalence of Glaucoma in Urban Population:
  - PAOG : 4.8%
  - PACG : 2.3%
16. Myopia among Glaucoma Cases: 13.2%

**DISCUSSION:**

Prevalence of glaucoma in present study is 2.35%, in Bourne et al<sup>5</sup> it is 3.8%, in Bengtsson et al<sup>2</sup> it is 1.25%, in Gross et al<sup>12</sup> it is 2.02%. Glaucoma rates among males and females in present study is 2.01% and 2.67%, 3.2% and 5.9% in Bourne et al<sup>5</sup>, 2.08% and 1.26% in Raychaudhuri et al<sup>6</sup>, 0.76% and 0.86% in Vijaya et al<sup>9</sup> respectively. Glaucoma rates among the people in age groups of 50-59, 60-69, 70+ are, 1.33%, 5.1%, 14.63% in the present study, 0.7%, 2.8% and 4.2% in Bengtsson et al<sup>2</sup>, 1.9%, 5.9%, 16.9% in Bourne et al<sup>5</sup>, 1.4%, 6.62%, 23.01% in Nangia et al<sup>11</sup> respectively. Prevalence of secondary glaucoma is 0.37% in the present study, 0.27% in Bengtsson et al<sup>2</sup>, 0.7% in Bourne et al<sup>5</sup> and 0.15% in Gross et al<sup>12</sup>. Major types of glaucoma PAOG and PACG are prevalent in 2.48% and 1.12% individuals in the present study, 2.3% and 0.9% in Bourne et al<sup>5</sup>, 1.63% and 1.58% in CGS<sup>13</sup>, 3.51% and 0.88% in Nangia et al<sup>11</sup> respectively. Prevalence of glaucomatous blindness in present study is 7.1%, in Quigley et al<sup>14</sup> 11.0%, in CGS<sup>13</sup> 4.3%, in Sommer et al<sup>15</sup> 12.2%. Pseudo exfoliation glaucoma rates are 4.75% in present study, 3.85% in CGS<sup>13</sup>, 4.0% in Sales et al<sup>7</sup>, 6.45% in Gross et al<sup>12</sup>. Prevalence of congenital glaucoma is 0.02% in present study, 0.05% in Bengtsson et al<sup>2</sup>, 0% in Gross et al<sup>12</sup>, 0.004% in Hu et al<sup>8</sup>. Glaucoma in people less than 45 years of age is 0.5% in present study, 0.34% in Gross et al<sup>12</sup>, 0.54% in Nangia et al<sup>11</sup>, 0.63% in Vijaya et al<sup>9</sup>. Glaucoma more than 70 years of age is 17.7% in present study, 16.9% in Bourne et al<sup>5</sup>, 4.0% in Ramakrishnan et al<sup>16</sup>, 23.01% in Nangia et al<sup>11</sup>. Primary open angle glaucoma in the age groups 40-49, 50-59, 60-69, 70+ is, 0.9%, 1.9%, 2.9% and 4.0% in present study, 1.3%, 2.3%, 4.9% and 6.3% in Dandona et al<sup>3</sup>, 0.3%, 1.6%, 1.8% and 2.9% in Ramakrishnan et al<sup>16</sup>, 1.1%, 1.9%, 2.0% and 3.0% in Quigley et al<sup>14</sup> respectively. Primary angle closure glaucoma in the age groups 40-49, 50-59, 60-69, 70+ is, 0.3%, 0.8%, 1.1% and 1.5% in present study, 0.0%, 1.5%, 2.3% and 3.2% in Dandona et al<sup>3</sup>, 0.5%, 0.5%, 0.5% and 0.5% in Ramakrishnan et al<sup>16</sup>, 0.4%, 0.6%, 0.6% and 1.0% in Quigley et al<sup>14</sup> respectively. PAOG and PACG rates in rural population are, 3.9% and 1.5% in the present study, 6.4% and 2.0% in Foster et al<sup>10</sup>, 1.63% and 1.58% in CGS<sup>13</sup>, 3.51% and 0.88% in Nangia et al<sup>11</sup> respectively. PAOG and PACG rates in urban population are, 4.8% and 2.3% in the present study, 6.3% and 2.2% in Foster et al<sup>10</sup>, 6.0% and 3.1% in Bourne et al<sup>5</sup>, 1.9% and 1.42% in Dandona et al<sup>3</sup> respectively. Prevalence rates of myopia among glaucoma cases are 13.2% in present study, 17.2% in Sales et al<sup>7</sup>, 8.6% in Mitchell et al<sup>4</sup>, and 13.7% in Hu et al<sup>8</sup>.

**CONCLUSION:**

Prevalence of glaucoma rises as the age advances. Females are more likely to be affected than males. Glaucoma is more prevalent in urban population than rural population. More than 10% of glaucoma patients have myopic vision. Angle open glaucoma is more prevalent than angle closure glaucoma.

**RECOMMENDATION:**

More studies should be conducted about the glaucoma prevalence and studies involving large sample size are recommended.

**LIMITATION:**

The results cannot be generalized as it involves only one area of Kanyakumari District.

**CONFLICT OF INTEREST - Nil**

**REFERENCES:**

1. Yin Chung Tham, B. H. (2014). Global prevalence of glaucoma and Projections of glaucoma burden through 2040. AAO Journal.
2. BENGTSOON, B. (1981). The prevalence of glaucoma. Lund, Sweden: British Journal of Ophthalmology.
3. Dandona, L. (2000). Prevalence of Glaucoma. Hyderabad, Andhra Pradesh.
4. Paul Mitchell, F. H. (2015). The Relationship between glaucoma and myopia. Australia: BJO.
5. R R A Bourne, P. S. (2003). Prevalence of glaucoma in Thailand: a population based survey. Rom Klao District, Bangkok: British Journal of Ophthalmology.
6. A Raychaudhuri, S. K. (2005). A population based survey of the prevalence and types of glaucoma in Rural West Bengal. West Bengal: British Journal of Ophthalmology.
7. Christopher S. Sales<sup>1</sup>\*, M. M. (2014). Prevalence of Glaucomatous Disease in Young Chinese Adults: A Pilot Study. China: Sales et al.
8. HU, D.-N. (1987). Prevalence and mode of inheritance of major genetic eye diseases in China. From the Zhabei Eye Institute, Shanghai, and Section of Ophthalmic Genetics, Chinese Society of Genetics.: British Journal of Ophthalmology.
9. Lingam Vijaya, 1. R. (2005). Prevalence of Open-Angle Glaucoma in a Rural South Indian Population. South India: Vijaya et al.
10. Paul J Foster, G. J. (2001). Glaucoma in China: how big is the problem? (E. T. Jr, Ed.) British Journal of Ophthalmology.
11. Vinay Nangia<sup>1</sup>\*, J. B.-J. (2013). The Central India Eye and Medical Study. Central India: PLOS ONE.
12. Susanne Marx-Gross, D. L.-R. (2017). Population-based Gutenberg Health Study. Deutsches Ärzteblatt International.
13. Amruthavalli A, M. (2004). Chennai glaucoma study. Ind Journ Ophthal.
14. Quigley, H. A. (1996). Number of people with glaucoma worldwide. Europe, Africa, Asia: British Journal of Ophthalmology.
15. Sommer A, T. J. (1991). Relationship between intraocular pressure and primary open angle glaucoma among white and black Americans (Vol. Arch Ophthalmol). The Baltimore eye survey.
16. Ramakrishnan, L. (1984). A glaucoma survey in South India. (Vols. 57: 357-9.). Doc Ophthalmol.