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Clinical profile of patients with angle closure glaucoma

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Abstract
Introduction: Glaucoma, the second leading cause of world blindness accounts for 15% of global blindness. The regional burden of blindness is highest for India (23.5% of global blindness) with at least 5.8 million blind due to glaucoma. India accounts for a minimum of 12.9% of primary angle closure glaucoma blindness in the world
Methodology: All the 200 patient who are at risk of ACG well evaluated taking detail history and examination Detailed history pertaining to the risk factors which may cause future Angle closure glaucoma were ascertained.
Results: Out of 202 cases studied there were 51 patients in the age group between 41-50 among which 16 males (18.60%) and 35 females (30.17%). The maximum number of cases i.e., 76 were in the age group between 51-60 years of age among them 34 (39.53%) were males and 42 (36.21%) were females
Conclusion: In our study, there were 120 (59.41%) positives and 82 (40.59%) negatives in the prone test. There were 104 (51.49%) positives and 98 (48.51%) negatives in the mydriatic test.

Keywords: angle closure glaucoma, prone test, mydriatic test

Introduction

The primary glaucomas were classified by Shaffer in to open angle, narrow angle, combined mechanism and congenital glaucoma [1].

Glaucoma, the second leading cause of world blindness accounts for 15% of global blindness. The regional burden of blindness is highest for India (23.5% of global blindness) with at least 5.8 million blind due to glaucoma. India accounts for a minimum of 12.9% of primary angle closure glaucoma blindness in the world. These blindness figures are expected to double by 2020 AD [2]. The measurement of axial chamber depth may have potential in screening for PACG. The need for public health initiatives to combat PACG was highlighted by an estimate that half of the 67 million people suffering from primary glaucoma globally have PACG. It has been calculated that 6.7 million people worldwide have been irreversibly blinded as a consequence of glaucoma. Half of these are Asians. A means of detecting those at risk (people with occludable drainage angles) is a prerequisite of a prevention program. If an effective test can be identified PACG may need the criteria for viable population screening [3].

The prevalence of PACG in this urban population in southern India is close to that reported in Mangolian population. A large proportion of the PACG in this population was undiagnosed and untreated [4].

PACG may be screened for on a population basis by means of various techniques that estimates axial or a limbal anterior chamber depth, measure intraocular pressure, or evaluate the optic disc or visual fields. Demographic information and medical and family history will also be of great importance in screening for PACG in large populations. Groups at increased risk for the disease include women, individuals over 50, first degree relatives of PACG probands, and hyperopes [5].

None of these test factors studied, including an angle closure provocative test, ocular biometry and gonioscopy, showed both a high sensitivity and positive predictive accuracy in detecting the eyes that later developed angle closure [6]. A- mode ultrasound measurement of the axial anterior chamber depth has been suggested as a screening tool for primary angle closure and is effective in the early detection of gonioscopically occludable angles in the population. The equipment required is potable and easy to use by non medical personnel. Thus it fulfils some of the requirements that can be used in the community [7, 8].

In India asymptomatic chronic angle closure glaucoma mimicking primary open angle glaucoma (POAG) is common. Gonioscopy is the confirmatory test and must become a part of the routine workup for our glaucoma patients and suspects. Provocative testing may play a supportive role in asymptomatic occludable angles.

Methodology

Inclusion criteria

1. Patients more than 40 years of age.
2. First degree relatives of angle closure glaucoma patients.
3. Fellow eye of angle closure glaucoma patient.
4. Hypermetropic patients.

Exclusion criteria

1. Patients less than 40 years of age.
2. Patients with open angle glaucoma.
3. Myopic patients.

Minimum of 200 patients who were having high risk for development of angle closure glaucoma were selected by routine history and relevant examination and with their consent subjected them for the provocative tests and results were analysed and discussed.

All the 200 patient who are at risk of ACG well evaluated taking detail history and examination Detailed history pertaining to the risk factors which may cause future Angle

closure glaucoma were ascertained.
The details of history included duration, onset of pain, redness, watering, headache, visual loss and associated symptoms like nausea and vomiting was taken. Any history of previous attack of Angle closure glaucoma was enquired.
Physical Examination of all the 200 patients included a thorough examination of general and systemic examination, examination of globe and adnexa and included all the features which helps in evaluating the associated risk of Angle closure glaucoma.
A detailed perform of the case sheet as been shown later, vision and refraction, fundal examination, angle structure perimetry, A –scan, Intra -ocular pressur. Vision and refraction was done with snellen's chart & recorded
Fundal examination was done under dilated pupil. Angle structure studied with Goldman three mirror gonioscopy and graded accordingly and Visual field was done with octopus perimeter. Three reading of IOP measurement done with applanation tonometer before and after the provocative tests and average of three readings was taken.

Results
The present study involved 202 cases of high risk patients for the developing of angle closure glaucoma.

Table 1: The age and sex distribution in the study group

Age	Male	Percentage (%)	Female	Percentage (%)
41-50	16	18.60	35	30.17
51-60	34	39.53	42	36.21
61-70	31	36.05	35	30.17
71-80	5	5.82	4	3.45
Total	86	100	116	100

Table (1), shows the distribution according to age and sex in the study group

- Out of 202 cases studied there were 51 patients in the age group between 41-50 among which 16 males (18.60%) and 35 females (30.17%).
- The maximum number of cases i.e., 76 were in the age group between 51-60 years of age among them 34 (39.53%) were males and 42 (36.21%) were females.
- The second largest group of 66 patients were in the age group between 61-70 among them 31 (36.05%) were male and 35 (30.17%) were females.
- There were only 9 patients in the age group between 71-80 among which 5 (5.82%) male and 4 (3.45%) females.
- In total there were 86 males and 116 female patients in this study group.

Table 2: The distribution variation of DT Vs MT

DT/MT	Positive	Negative	Total
Positive	72(35.64) (a)	10(4.95) (b)	82
Negative	32(15.84) (c)	88(43.56) (d)	120
Total	104	98	202(η)

Fisher Exact Test $P \leq 0.0001$
$\chi 2$ η -£ = 72.8975; d.f = 1; $P \leq 0.0001$
$\chi 2$ at 5% of level of significance is 3.84 and at 1% level os significance is 6.63. Since the calculated value is greater than the table value, hence we reject null hypothesis (Ho).
(Ho: There is no significant difference between DT and MT).
We accept H1 (Alternate hypothesis)
Therefore there is significant difference between DT and MT.

1. Sensitivity (%) = (a/(a+c))*100 = (72/104)*100 = 69.23%
2. Specificity(%) = (d/(b+d))*100 = (88/98)*100 = 89.80%
3. Positive predictive value (%) = (a/(a+b))*100 = (72/82)*100 = 87.80%
4. Negative predictive value (%) = (d/(c+d))*100 = (88/120)*100 = 73.33%
5. Percentage of False Negative (%) = (c/(a+c))*100 = (32/104)*100 = 30.77%
6. Percentage of False Positive (%) = (b/(b+d))*100 = (10/98)*100 = 10.20%

Table 3: The distribution variation of DT Vs PT

DT/PT	Positive	Negative	Total
Positive	73(36.14) (a)	09(4.46) (b)	82
Negative	47(23.27) (c)	73(36.14) (d)	120
Total	120	82	202(η)

Fisher Exact Test $P \leq 0.0001$
$\chi 2$ η -£ = 50.21; d.f = 1; $P \leq 0.0001$
$\chi 2$ at 5% of level of significance is 3.84 and at 1% level os significance is 6.63. Since the calculated value is greater than the table value, hence we reject null hypothesis (Ho).
(Ho: There is no significant difference between DT and PT).
We accept H1 (Alternate hypothesis)
Therefore there is significant difference between DT and PT.

1. Sensitivity(%) = (a/(a+c))*100 = (73/120)*100 = 60.83%
2. Specificity(%) = (d/(b+d))*100 = (73/82)*100 = 89.02%
3. Positive predictive value (%) = (a/(a+b))*100 = (73/82)*100 = 89.02%
4. Negative predictive value (%) = (d/(c+d))*100 = (73/120)*100 = 60.83%
5. Percentage of False Negative (%) = (c/(a+c))*100 = (47/120)*100 = 39.17%
6. Percentage of False Positive (%) = (b/(b+d))*100 = (09/82)*100 = 10.98%

Table 4: The distribution variation of MT Vs PT

MT/PT	Positive	Negative	Total
Positive	94(46.53) (a)	10(04.95) (b)	104
Negative	26(12.87) (c)	72(35.64) (d)	98
Total	120	82	202(η)

Fisher Exact Test $P \leq 0.0001$
$\chi 2$ η -£ = 85.3084; d.f = 1; $P \leq 0.0001$
$\chi 2$ at 5% of level of significance is 3.84 and at 1% level os significance is 6.63. Since the calculated value is greater than the table value, hence we reject null hypothesis (Ho).
(Ho: There is no significant difference between MT and PT).
We accept H1 (Alternate hypothesis)
Therefore there is significant difference between MT and PT.

1. Sensitivity (%) = (a/(a+c))*100 = (94/120)*100 = 78.33%

2. Specificity (%) = (d/(b+d))*100 = (72/82)*100 = 87.80%
3. Positive predictive value (%) = (a/(a+b))*100 = (94/104)*100 = 90.38%
4. Negative predictive value (%) = (d/(c+d))*100 = (72/98)*100 = 73.47%
5. Percentage of False Negative (%) = (c/(a+c))*100 = (26/120)*100 = 21.67%
6. Percentage of False Positive (%) = (b/(b+d))*100 = (10/82)*100 = 12.20%

Discussion

The depth and volume of anterior chamber diminishes with age [9], which may result from a thickening and forward displacement of the lens [10]. Consequently the percentage of individuals with critically narrow angles is higher in older age groups. The prevalence of pupillary block glaucoma also increases with age.

In a study by Markowitz and Morin [11], a bimodal peak was observed, with the first at ages 53-58 years and the second at 63-70 years.

In the present study, the maximum number of cases i.e., 76 (37.62%) were in the age group between 51-60 years and the second largest group of 66(32.67%) patients were in the age group between 61-70 years and the next most common age group was between 41-50 years having 51(25.25%) patients.

There is a statistically significant predominance of females in populations with pupillary block glaucoma, which is felt to be due to the shallower anterior chamber in females in general.

In the present study among 202 patients 116(57.43%) were females and 86 (42.57%) were males which shows significant number of females who are at high risk. In a study by Salmon JF in mixed race from the Western Cape area of South Africa shows women affected more often than men, independent of age [12].

In our study, there were 120 (59.41%) positives and 82 (40.59%) negatives in the prone test. There were 104 (51.49%) positives and 98 (48.51%) negatives in the mydriatic test. There were 82 (40.59%) positives and 120 (59.41%) negatives in the dark room test. And when dark room test and mydriatic tests were studied together the following results was reached:

Fisher Exact Test P- Value <0.0001

$\chi 2 = 72.8975$; d.f = 1; P- Value <0.0001

1. Sensitivity = 69.23%
2. Specificity = 89.79%
3. Positive predictive value = 87.80%
4. Negative predictive value = 73.33%
5. Percentage of False Negative = 30.76%
6. Percentage of False Positive = 10.20%

$\chi 2$ at 5% of level of significance is 3.84 and at 1% level os significance is 6.63.

Since the calculated value is greater than the table value, hence we reject null hypothesis (Ho). (Ho: There is no significant difference between DT and MT).

We accept H1 (Alternate hypothesis)

Therefore there is significant difference between DT and MT.

When dark room test and prone test were studied the following results were seen:

Fisher Exact Test P- Value <0.0001

$\chi 2 = 50.21$; d.f = 1; P- Value <0.0001

1. Sensitivity = 60.83%
2. Specificity = 89.02%
3. Positive predictive value = 89.02%
4. Negative predictive value = 60.83%
5. Percentage of False Negative = 39.16%
6. Percentage of False Positive = 10.97%

$\chi 2$ test at 5% of level of significance is 3.84 and at 1% level os significance is 6.63. Since the calculated value is greater than the table value, hence we reject null hypothesis (Ho).

(Ho: There is no significant difference between DT and PT).

We accept H1 (Alternate hypothesis)

Therefore there is significant difference between DT and PT.

The mydriatic and prone test studies give the following results:

Fisher Exact Test P- Value <0.0001

$\chi 2 = 85.3084$; d.f = 1; P- Value <0.0001

Sensitivity = 78.33%

1. Specificity = 87.80%
2. Positive predictive value = 90.38%
3. Negative predictive value = 73.46%
4. Percentage of False Negative = 21.67%
5. Percentage of False Positive = 12.19%

$\chi 2$ test at 5% of level of significance is 3.84 and at 1% level os significance is 6.63. Since the calculated value is greater than the table value, hence we reject null hypothesis (Ho).

(Ho: There is no significant difference between MT and PT).

We accept H1 (Alternate hypothesis)

Therefore there is significant difference between MT and PT.

In a study done by Wilensky *et al*., in 129 angle glaucoma suspects who underwent gonioscopy, refraction, anterior chamber pachymetry, ultrasound biomicroscopy, and an angle-closure provocative test, it was concluded that none of the test factors studied showed a high sensitivity or positive predictive accuracy in detecting eyes that later developed angle closure [13]. Our results were comparable with the previous studies.

Conclusion

There were 120 (59.41%) positives and 82 (40.59%) negatives in the prone test. There were 104 (51.49%) positives and 98 (48.51%) negatives in the mydriatic test. There were 82 (40.59%) positives and 120 (59.41%) negatives in the dark room test. In the present study 141 (69.80%) patients had shallow anterior chamber and 61 (30.20%) had normal chamber.

References

1. Hyans SW, Friedman Z, Neumann E. Elevated Intraocular Pressure in the prone position. Am. J. Ophthalmol. 1966; 66:661-72.
2. Jayachandra Das, Sharad Bhomaj, Zia Choudhari. Profile of Glaucoma in amajor eye hospital in North India. Indian. J. Ophthalmol. 2001; 49:25-30.
3. Joe Devereux G, Paul Foster J, Jamyanjav Baasanhu. Anterior Chamber depth meausurement as a screening tool for primary angle closure glaucoma in an East Asian Population. Arch. Ophthmol, 2000; 118:257-263.
4. Dandona L, Dandona R, Mandal P *et al*. Angle Closure Glaucoma in an Urban population in Southern India. The Andhra Pradesh Eye Disease Study. Ophthalmology, 2000; 107(9):1710-6.
5. Congdon N, Wang F, Tielsch JM. Issues in the epidemiology and population based screening of primary angle closure glaucoma. Surv Ophthalmol, 1992; 36(6):4411-23.

6. Jacob Wilensky J, Paul Kaufman L. Diane Frohlichstein. Followup of Angle Closure Glaucoma suspects. Am. J. Ophthalmol, 1993; 115:338-346.
7. Congdon N, Quingley HA, Hung PT *et al*. Screening Techniques for Angle Closure Glaucoma in Rural Taiwan. Acta Ophthalmol, 1996; 74:113:19.
8. Nalan WP, Baashanhu J, Undraa A *et al*. Screening for primary angle closure in Mangolia. Br. J. Ophthalmol, 2003; 87:271-274.
9. Fontana ST, Brubaker RF. Volume and depth of the anterior chamber in the normal aging human eye. Arch Ophthalmol, 1980; 98:1803.
10. Okabe I, Taniguchi T, Yamamoto T *et al*. Age related changes of the anterior chamber width. J Glaucoma. 1992; 1:100.
11. Markowitz SN, Morin JD. Angle closure glaucoma: relation between lens thickness, anterior chamber depth and age. Can J Ophthalmol. 1984; 19:300.
12. Wilensky JT, Kaufman PL, Frohlichstien D *et al*. Follow up of angleclosure glaucoma suspects. Am J. Ophthalmol. 1993; 115:338.
13. Lee DA, Brubaker RF, Ilstrup DM. Anterior chamber dimensions in patients with narrow angles and angle-closure glaucoma. Arch Ophthalmol, 1984; 102:46.