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RISK FACTORS FOR DEVELOPMENT OF ANGLE CLOSURE GLAUCOMA IN EYES WITH SHALLOW ANTERIOR CHAMBER

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AIM: To determine risk factors for development of angle closure in eyes with shallow anterior chamber and to compare the visual morbidity due to various types of angle closure in eyes with shallow anterior chamber. **MATERIALS AND METHODS**: Patients with age above 30 years were screened. 100 eyes of 50 patients with shallow anterior chamber detected by Van Herick's method were included in the study. Eyes with grade 3 and below by Van Herick's method were further examined in detail. Visual acuity, refraction and intra ocular pressure were recorded. Gonioscopy was done. **RESULTS**: Of 100 eyes studied 20 male and 30 female patients. 28 eyes of female patients and 10 eyes of male patients had appositional closure. Angle closure was seen in 20 eyes. Permanent reduction of vision to 6/12 or less was seen in 17 eyes. **CONCLUSION:** The most common risk factor for angle closure glaucoma is narrow angle. Van Herick's method is important in identifying shallow anterior chamber. Identifying risk factors for development of angle closure and hence preventing angle closure reduces visual morbidity.
KEY WORDS: Occludable angle, angle closure, risk factors, aged, female, van herick's, shallow anterior chamber.

INTRODUCTION: Visual impairment is a global public health problem and glaucoma is the leading cause of irreversible blindness worldwide .[1] Primary angle-closure glaucoma (PACG) and primary angle closure (PAC) are more common in East Asian countries than in Western countries, and the former often results in bilateral blindness. [2] It has been estimated that 3.9 million people with glaucoma will be blind due to primary angle closure glaucoma (PACG) by 2010. By 2020, this number is projected to increase to 5.3 million.[3] Eighty-six percent of people with PACG are in Asia, with approximately 48.0% in China, 23.9% in India and 14.1% in southeast Asia.[3] The prevalence of glaucoma depends on many factors, including ethnicity, age, gender, and geographic region. In the developing world, more than 80% of the people affected with glaucoma are unaware that they have the disease, and visual impairment from primary angle closure glaucoma is more severe than from primary open angle glaucoma. Identification of risk factors for primary angle closure glaucoma is essential for early detection and timely intervention to prevent visual impairment.[4] The prevalence rate of angle closure glaucoma among different population is as follows 1.0% in Singapore,[5]and 0.5% to 1.08% in India. [6, 7]

MATERIALS AND METHODS: Present study was carried out in department of Ophthalmology Kempegowda institute of medical sciences Bangalore from June 2011 to December 2012. This was randomized prospective study aimed at determining prevalence of angle closure in hospital patients and evaluates risk factors responsible for angle closure that may end up in angle closure glaucoma.

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The study group consisted of 100 eyes of 50 patients above the age of 30 years of both sexes. Shallow anterior chamber detected in slit lamp examination by Van Herick's method were further examined in detail. Visual acuity recorded and refraction was done. Intraocular pressure was measured with applanation tonometer. Further gonioscopy was performed in all eyes. Angle was graded by shaffers method and categorized as open angle, appositional angle closure and frank cases of angle closure glaucoma. Cases of secondary angle closure glaucoma, eyes operated and injured and those cases that were already on treatment for primary angle closure glaucoma were excluded from study. Fundus examination carried out using direct and indirect ophthalmoscopy. Optic disc changes and nerve fiber layer defect if any documented. Medical history and family history noted.

RESULTS: A total number of 50 patients (100 eyes) from both sexes were studied. Of which 30 female (60%) and 20(40%) male. [TABLE- 1] age and gender wise distribution of eyes given in [TABLE- 2]. Of the total 100 eye studied in gonioscopic examination 42 eyes were open angle, 20 angle closure and 38 appositional angle closure i.e 52% had open angle and 58% had narrow angle and 38% carried risk and possibility of angle closure glaucoma subsequently. [TABLE – 3] Gonioscopic angles in relation with gender were tabulated. The risk of angle closure was 38 eyes, of which 28 eyes were in females and of 20 eyes which had angle closure 12 eyes in females compared to males where only 10 eyes had occludable angle n 8 eyes had angle closure. [TABLE-4] Visual acuity in 80 out of 100 were 6/6, 20 eyes showed best corrected visual acuity ranging from 6/9 to no perception of light. [TABLE-5] of the 100 eyes studied 64 eyes had hypermetropia, 33 emmetropia and 2 eyes myopia. [TABLE-6]

DISCUSSION: Glaucoma is a leading cause of blindness in advancing age group. Primary angle closure glaucoma is seen in eyes with shallow anterior chamber. The present study is aimed at identifying those eyes predisposed for angle closure glaucoma and prevent ocular morbidity. In our study we observed that the prevalence of both angle closure glaucoma and appositional angle closure was more common in females. [table-3] Prevalence of occludable angle was 38 % in our study. Similar study conducted in Eskimos showed prevalence of 54.6% [7] and 47.8 %[8] in Vietnamese population older than 55 years of age.

Angle closure glaucoma is the predominant form of glaucoma in East Asia. In our study angle closure glaucoma was seen in 20 eyes of hundred eyes examined with shallow anterior chamber and it was more common in females. Angle closure glaucoma is typically seen in women in fifth or sixth decade of life. The prevalence rate of primary angle closure glaucoma is not uniform as the prevalence rate varies depending on race, age of onset and criteria used for defining occludable angle. Compared to population based study, hospital based study shows higher prevalence because most of the patients who come to the hospital are diseased where as population based study consists of general population.

The risk factors in the development of angle closure glaucoma are age, gender, race, family history, refractive error and precipitating factors. It is found that occurrence of pupillary block is more in sixth and seventh decade where as it is rare in younger age group because of increasing thickness of lens.[10] In a study in Minnesota[9] the incidence of angle closure glaucoma was 8.3 per 1,00,000 population in 40 years and the same study found that 14% of participants were blind in at least one eye at the time of diagnosis and further 4% became mono ocular blind over a 5 year follow

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up. Our present study shows the occurrence of primary angle closure glaucoma only after 45 years of age. More than 50% of cases are seen in patients 51-60 years of age. Most of the studies have reported PACG to occur 2-3 times more commonly in women than in men. In our present study also of the 100 eyes 20 eyes were diagnosed to have Angle closure glaucoma out of which 12 eyes belonged to females and 8 eyes belonged to males. Out of 38 eyes with appositional angle closure 28 eyes belonged to females and 10 eyes to males. This also shows that risk for angle closure is more common among females. The other observation in the study was that out of 100 eyes studied 64 eyes had hypermetropia. All 18 eyes with angle closure glaucoma were hypermetropic. It has been shown that hypermetropia is one of the risk factor for angle closure glaucoma. [10] Studies have shown that loss of visual acuity is more common and severe in angle closure glaucoma.[11]

CONCLUSION: Patients with shallow anterior chamber are detected in routine slit lamp examination by Van Herick's method. If they are examined in detail as in our study high rate of occludable angle is found. Careful follow up of patients will not only prevent angle closure glaucoma, optic nerve damage but also visual morbidity is reduced.

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Gender	Female	30patients	60 Eyes
	Male	20 Patients	40 Eyes
	Total	50 Patients	100 Eyes

TABLE – I: TOTAL NO. OF PATIENTS STUDIED (50)

Gender	Female (30)		Male (20)		Total Eyes	
Age – Group	Patients	Eyes	Patients	Eyes	Patients	Eyes
31 – 40 yrs	6	12	2	4	8	16
41 – 50 yrs	14	28	3	6	17	34
51 – 60 yrs	6	12	8	16	14	28
60 & Above	4	8	7	14	11	22
Total	30	60	20	40	50	100

TABLE – II: AGE AND GENDER-WISE DISTRIBUTION OF EYES (100)

	No. of Eyes
Total No. of Eyes Studies	100
Open – Angle	42
Angle – Closure	20
Occludable Angle	38

TABLE III: Prevalence distribution of cases 50 patients (100 eyes)

	Total No. of Eyes	Open-Angle	Angle-Closure	Occludable Angle
Female (30 Patients)	60	20 Eyes	12 Eyes	28 Eyes
Male (20 Patients)	40	22 Eyes	8 Eyes	10 Eyes
Total (50 patients)	**100**	**42Eyes**	**20 Eyes**	**38 Eyes**

TABLE – IV: OVER-ALL ANALYSIS OF 100 EYES

Visual Acuity	No. of Eyes
6/6	80
6/9	3
6/12	2
6/18	5
6/24	5
6/36	3
PL +	1
PL -	1
Total	**100 Eyes**

TABLE V: VISUAL ACUITY IN 100 EYES

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REFRACTIVE STATUS	EYES
Emmetropia	33
Hypermetropia	64
Myopia	02
TABLE VI	

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