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Assessment of Occludable Angle in Angle Closure Glaucoma Patients Having High Risk

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Abstract:
Introduction: At present 12 million Indians were affected by glaucoma accounting for 12.8% of the blindness of the country with 45 to 55% of primary glaucoma being PACG. The screening of patients with a high risk of iridotrabecular contact and subsequently primary angle closure is important. Early diagnosis and treatment is very much essential in dealing with high risk groups for angle closure glaucoma having occludable angle. The main aim of this study is to screen for Angle Closure Glaucoma in high risk groups with the
Objectives:1) To know the incidence of occludable angles in high risk groups for angle closure glaucoma.
2) To highlight the importance of screening for angle closure suspects in high risk groups. Methodology: The present longitudinal study was conducted in the Dept. of ophthalmology, Dr Pinnamaneni Siddhartha Institute of Medical Sciences and Research Foundation (Dr.PSIMS), Chinoutapalli, Krishna District, Andhra Pradesh with the institutional ethical committee clearance. A sample of 100 selected patients who attended ophthalmology opd as outpatients.
Results: Out of 100 cases 18% patients had occludable angles, 72% patients had open angles.Degree of hypermetropia in the occludable angles: Out of 18 cases with occludable angles 4 eyes had hyperopic error between 0.50-1.00D, 9 cases had hyperopic error between 1.25-2.00D,5 cases had hyperopic error between 2.50-3.00D. In the present study, 20% cases were known Diabetics out of them 40% had occludable angles.
Conclusion: Measurement of peripheral anterior chamber depth is believed to be useful for glaucoma screening and gonioscopy should make the final assessment. For primary angle closure (PAC) or early primary angle closure glaucoma, case detection presents the unique opportunity to prevent blindness from glaucoma.
Keywords: Primary angle closure glaucoma, Occludable angle, Hypermetropia

I. Introduction

The many clinical entities grouped under angle-closure glaucoma are characterized by iridotrabecular apposition or adhesion or both. In most cases, no problem is detected until the outflow facility has decreased enough to cause a clinically significant elevation of intraocular pressure (IOP).The sequence of eventsand the mechanism can be highly variable. However, in each case an initial attempt to identify the anatomical changes the pathophysiology must be carried out to make the correct and early diagnosis and choose the most appropriate management. It is estimated that by the year 2020 there would be 79.6 million people burdened by glaucoma, 47% of the glaucoma worldwide would be in Asia with more than 75% being Angle closure glaucoma[1].At present 12 million Indians were affected by glaucoma accounting for 12.8% of the blindness of the country with 45 to 55% of primary glaucoma being PACG[2].A large proportion of PACG in this population was undiagnosed and untreated because more than 80% of the chronic angle closures have no significant symptoms. Because visual loss resulting from PACG is potentially preventable if peripheral iridotomy or iridectomy is performed in the early stages, strategies for early detection of PACG could reduce the high risk of blindness resulting from PACG seen in this urban population of India[3]. Subacute angle closure glaucoma frequently damages eyes and affects vision, yet may show no obvious evidence of its presence between attacks. In favourable circumstances it can be cured by relatively simple , appropriate tests it appears highly desirable to facilitate its detection before an all too obvious acute attack develops[4]. Hence the screening of patients with a high risk of iridotrabecular contact and subsequently primary angle closure is important. Early diagnosis and treatment is very much essential in dealing with high risk groups for angle closure glaucoma having occludable angle. The main aim of this study is to screen for Angle Closure Glaucoma in high risk groups with the objectives 1) To know the incidence of occludable angles in high risk groups for angle closure glaucoma. 2) To highlight the importance of screening for angle closure suspects in high risk groups. This study was undertaken to determine the possibility of identifying eyes that were at risk of developing spontaneous angle closure glaucoma so that they could be protected from of an acute attack of angle closure.the risks of surgical iridectomy are less than the dangers of an acute attack of angle-closure and prophylactic surgery was therefore justified if eyes that are at high risk could be identified.

II. Materials and Methods

The present longitudinal study was conducted in the Dept. of ophthalmology, Dr Pinnamaneni Siddhartha Institute of Medical Sciences and Research Foundation (Dr.PSIMS), Chinoutapalli, Krishna District, Andhra Pradesh with the institutional ethical committee clearance. A sample of 100 selected patients who were attended to ophthalmology as outpatient. 100 patients who had high risk for development of angle closure Glaucoma were selected by routine history and relevant clinical examination and with Their informed consent were subjected to Gonioscopy. Inclusion Criteria: Age >40years, Shallow anterior chamber, Hypermetropia, Type 2 Diabetes mellitus, First degree relatives of angle closure glaucoma patients. Exclusion criteria: Known cases of angle closure glaucoma, Secondary angle closure glaucoma cases.

Patient Evaluation

All the 100 patients who were at risk of developing angle closure glaucoma were evaluated taking detailed history and examination. Detailed histories pertaining to risk factors which may cause future angle closure glaucoma were ascertained. The details of history included duration and onset of pain,redness,watering,headache,visual loss and associated symptoms like nausea and vomitting was taken. Any history of previous attack of angle closure glaucoma was enquired. Physical examination of all the 100 patients included a thorough examination of general and systematic examination, examination of globe and adnexa including all the features which help in evaluating the associated risk of angle closure glaucoma. A detailed proforma of the case sheet, Vision and refraction was done with snellen's chart &findings are recorded

Gonioscopy: Technique

Gonioscopy was performed at a low level of ambient illumination using a goldmann 2-mirror lens at high magnification (1.6*)with the eyes in the primary position of gaze. A 1mm light beam was reduced to a narrow slit, and the vertical beam was set horizontally for assessing superior and inferior angles and vertically for assessing nasal and temporal angles. Care was taken to avoid light falling on the pupil durning gonioscopy.0.5% proparacaine was used as a corneal anesthetic.A 2% Hyperomellose solution was used as a coupling medium for the cantact lens. The scheies grading scheme which is based on the angle structures visible during the examination was used.AC angles were classified as occludable or nonoccludable. Laser Peripheral iridotomy was performed as a prophylactic measure afterwards.

III. Results

Out of 100 cases studied there were 46% patients in the age group between 40-50, 36% of patients were in the age group between 51-60(36%). 14% patients were in the age group between 61-70 and only 4% of patients in the age group between 71-80. Out of 100 cases 39.5% had refractive error between +0.50D-1.00D, 46% of cases had refractive error between +1.25D-2.00D, 14.5% of cases had refractive error between +2.25D-3.00D. Out of 100 cases 18% patients had occludable angles, 72% patients had open angles. Out of 18 cases with occludable angles 4 eyes had hyperopic error between 0.50-1.00D, 9 cases had hyperopic error between 1.25-2.00D,5 cases had hyperopic error between 2.50-3.00D. In the present study, 20% cases were known Diabetics out of them 40% had occludable angles.

IV. Discussion

The depth and volume of anterior chamber diminishes with age[5] which may result from thickening and forward displacement of the lens[6].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[7] a bimodal peak was observed with the first at ages 53-58years and the second at 63-70years. In the present study Out of 100 cases studied there were 46 patients in the age group between 40-50(46%).The second largest group of 36 patients were in the age group between 51-60(36%).14 patients were in the age group between 61-70(14%).There were only 4 patients in the age group between 71-80(4%). There is statistically significant predominance of females in populations with pupillary block glaucoma, which is felt to be due to shallow anterior chamber in females in general[5, 8, 9]. In the present study we took into consideration only females. 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[10]. Mapstone R et al studied that because of the autonomic dysfunction some anterior segments develop a heightened response to autonomic mediators, endogenously released or exogenously applied, and the diaphragm of the iris and lens move forwards and closes the angle. The shallower the anterior chamber at the outset the greater the probability of this occurring[11]. In the present study also, 20% cases were known Diabetics out of them 40% had occludable angles. Numerous studies have reported that narrow angles and primary ACG occur more frequently in hyperopic eyes than in emmetropic or myopic eyes.[5,8,12,13] Hyperopic eyes are generally smaller in globe volume, which results in a crowding of the anterior chamber when the lens size is normal. In the present study Out of 100 cases 39.5% had refractive error between +0.50D-1.00D.46% of cases had refractive error between +1.25D-2.00D.14.5% of cases had refractive error between +2.25D-3.00D. Cases with narrow angles have higher spherical equivalent compared to open

angles. An occludable angle was defined as one in which the posterior trabecular meshwork was visible for less than 90 degrees of the angle circumference with gaze in primary position. In the present study Out of 100 cases 18 cases had occludable angles. 72 patients had open angles. In the present study Out of 18 cases with occludable angles 4 eyes had hyperopic error between 0.50-1.00D, 9 cases had hyperopic error between 1.25-2.00D and 5 cases had hyperopic error between 2.50-3.00D.

V. Conclusion

In the present study 18 cases were found to have occludable angles, prophylactic laser peripheral iridotomy is done. The van Herick test has been suggested as a screening test for angle closure.The sensitivity and specificity of this test are such that a negative test does not rule out angle closure and a positive test still requires a gonioscopy. The presence of a positive van Herrick and a raised IOP is highly specific, and almost pathognomonic, of closure, but gonioscopy is still required for management. On the basis of the results of this study, although the measurement of peripheral anteriorchamber depth is believed to be useful for glaucoma screening ophthalmologist utilizing gonioscope should make the final assessment. For primary angle closure (PAC) or early primary angle closure glaucoma, case detection presents the unique opportunity to prevent blindness from glaucoma. In order to achieve that goal, detection of 'early' disease (PAC; early PACG) prior to functional loss is important in primary angle closure disease. This study is not without lacunae .It is not a population based study, with a small sample size prone to bias .The gonioscopy findings have also not been verified by objective quantification of angle width using any imaging technology.

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