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B-Scan Ultrasonographic Findings in Ocular Conditions with Hazy Media at Tertiary Care Hospital

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Abstract

Aim: The purpose of this study is to evaluate the role of ultrasonography in the diagnosis and management of various ocular pathologies where direct visualization is hindered by hazy media, such as cataracts, corneal opacities, vitreous hemorrhage, and other ocular media disturbances.

Methods: A prospective, descriptive study was conducted on 50 patients presenting with hazy media at a tertiary care hospital. B-scan ultrasonography was performed on all patients to assess ocular pathology that could not be visualized due to media opacity.

Results: Of the 50 patients, the most common ultrasonographic finding was posterior vitreous detachment (28%), followed by retinal detachment (22%), vitreous hemorrhage (16%), asteroid hyalosis (12%, and other findings such as posterior staphyloma (8%) and optic disc drusen (6%). In 8%, no significant abnormality was found.

Conclusions: Ultrasonography is a valuable diagnostic tool in assessing ocular structures in patients with hazy media. It provides critical information for proper diagnosis and management.

Keywords: B-scan Ultrasonography; Posterior segment pathology; Hazy ocular media.

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INTRODUCTION

B-scan ultrasonography is a critical diagnostic tool in ophthalmology, especially for evaluating ocular conditions with hazy media that obscure direct visualization of the eye. Media opacities, such as cataracts, vitreous hemorrhage, or corneal opacities, can make it difficult to assess the retina, optic nerve, and other posterior segment structures. B-scan ultrasonography allows for detailed imaging of the eye's internal structures, enabling the detection of conditions like retinal detachment, intraocular tumors, and foreign bodies.

This modality is invaluable in cases where conventional examination methods fail.

Understanding the B-scan findings in these conditions is essential for accurate diagnosis, treatment, and management of patients with compromised ocular media. This journal will explore the role of B-scan ultrasonography in assessing ocular conditions with hazy media, highlighting its significance in clinical practice.

This study aims to document the ultrasonographic findings in a cohort of patients with ocular conditions associated with hazy media, providing a statistical analysis of the data and drawing conclusions about the utility of ultrasonography in these cases.

MATERIALS AND METHODS

Study Design

A prospective, descriptive study was conducted over 12 months in the Department of Ophthalmology at Navodaya Medical College, Hospital & Research Centre, Raichur, Karnataka. The study included 50 patients who presented with media opacities obscuring direct visualization of the posterior segment.

Ethical Clearance for the study has been obtained from the Ethical Committee of Navodaya Medical College, Hospital & Research Centre

Inclusion Criteria

- Patients with cataract, corneal opacities, vitreous hemorrhage, or other conditions leading to hazy ocular media.
- Patients where a clinical evaluation of the posterior segment was not possible due to media opacity.
- Consent to undergo B-scan ultrasonography.

Exclusion Criteria

- Patients who refused to consent.
- Patients where ultrasonography could not be performed due to ocular trauma or other contraindications.

Procedure

Patients underwent thorough Ocular Examinations for Anterior segment evaluation with

- Visual Acuity
- Fundus Examination with Direct and Indirect Ophthalmoscopes
- Intraocular Pressure with Non Contact Tonometry
- Slit Lamp Biomicroscopy for anterior segment examination and posterior segment details with 90D Lens
- The patients where the posterior segment was difficult to examined due to hazy ocular media were further evaluated with B- Scan Ultrasonography

Each patient underwent a detailed history and clinical examination, followed by B-scan ultrasonography using a 10 MHz transducer. Both axial and transverse scans were performed on the affected eye(s) to assess posterior segment pathology.

Data Collection

Data were collected on demographics, the underlying cause of media opacity, and ultrasonographic findings. Statistical analysis was performed using SPSS software, and the results were presented in percentages and proportions.

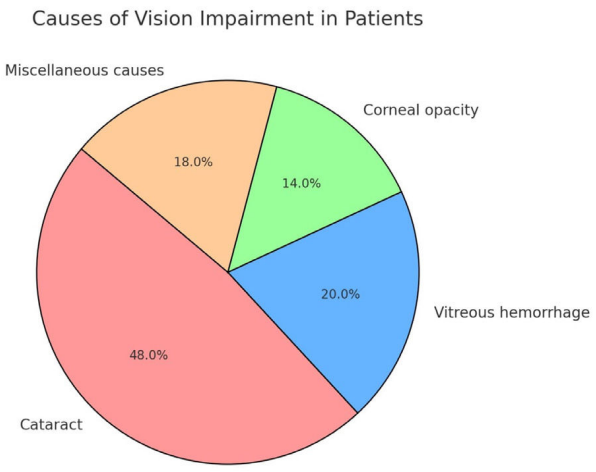
RESULTS

Demographics

The study included 50 patients, with an average age of 61.2 ± 14.6 years. There were 28 males (56%) and 22 females (44%).

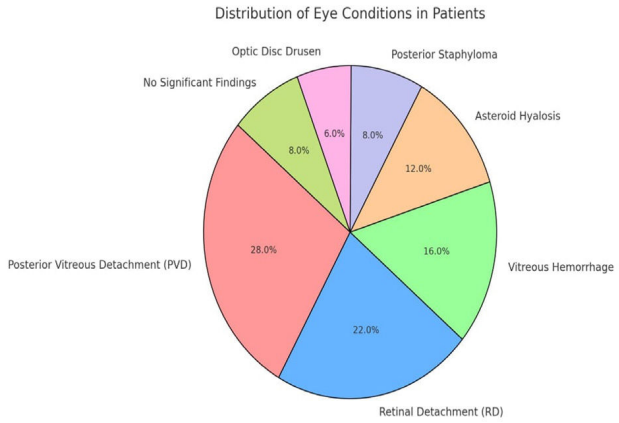
Causes of Media Opacity

- Cataract: 24 patients (48%)
- Vitreous hemorrhage: 10 patients (20%)
- Corneal opacity: 7 patients (14%)
- Miscellaneous causes (including dense posterior capsular opacities, uveitis): 9 patients (18%)



Ultrasonographic Findings

1. Posterior Vitreous Detachment (PVD): 14 patients (28%)
2. Retinal Detachment (RD): 11 patients (22%)
3. Vitreous Hemorrhage: 8 patients (16%)
4. Asteroid Hyalosis: 6 patients (12%)
5. Posterior Staphyloma: 4 patients (8%)
6. Optic Disc Drusen: 3 patients (6%)
7. No Significant Findings: 4 patients (8%)



DISCUSSION

Ultrasonography, especially B-scan, plays a vital role in diagnosing posterior segment pathology when the view is obscured by media opacities. In our study, posterior vitreous detachment and retinal detachment were the most common findings, consistent with existing literature. The detection of conditions like asteroid hyalosis highlights the diagnostic utility of ultrasonography when media opacity limits clinical examination.

- **Posterior Vitreous Detachment (PVD)** was the most frequently observed pathology, affecting 28% of patients. PVD is a common age-related condition, but its clinical significance increases in the presence of vitreous hemorrhage or retinal tears, which can progress to retinal detachment.

» Mohamed *et al.* study posterior vitreous detachment (PVD) 7(19%), and choroidal detachment (CD) 3(8.1%). was detected in in patients with poorly regulated HbA1c and graded either as moderate NPDR; severe NPDR; and proliferative retinopathy (PR).

» In Agarwal R *et al.* study they detected vitreous detachment in 33.33% cases, vitreous band was found in 10.25% cases, Choroidal abnormalities include maximum cases of choroidal detachment (80%), while choroidal hemorrhage was seen in 20%.

» P Sree Lakshmi *et al.* in their study, 71 eyes of 68 patients with vitreous haze and poor retinal visualization were investigated with ultrasound B–scan. Causes for the vitreous haze was due to VH with PVD in 10 eyes, Choroidal detachment in 4 eyes (20%), Posterior scleritis in 4 eyes (20%), choroidal melanoma in 1 eye.

- **Retinal Detachment (RD)** was identified in 22% of cases. Early detection of RD is crucial for prompt intervention, which can prevent permanent vision loss. Ultrasonography allows for the detailed assessment of RD, including the location and extent of the detachment.

» Mohamed *et al.* 1 study partial retinal detachment (PRD) 9(19%) was detected in 100 patient with help of B-Scan.

» In Agarwal R *et al.* study they detected Retinal detachment was the common retinal abnormality detected (41.5%), while retinoblastoma was seen in 5.66 % cases.

» P Sree Lakshmi *et al.* in their study, 71 eyes of 68 patients with vitreous haze and poor retinal visualization were investigated with ultrasound B – scan. Causes for the vitreous haze was due to VH with TRD in 12 eyes, VH with RRD in 6 eyes and VH with peripheral retinal tear in 2 eyes

- **Vitreous Hemorrhage** accounted for 16% of cases. This condition can obscure the retina and make clinical evaluation difficult. B-scan ultrasonography provides valuable information on the extent of the hemorrhage and any associated pathology such as retinal tears or detachments. In Mohamed *et al.*. study Vitreous hemorrhage (VH) 42 (66.6%), was detected in 100 patient with help of B-Scan.

» In Agarwal R *et al.* studymaximum no. of ocular abnormalities studied were of Vitreous (40.2%)

» P Sree Lakshmi *et al.* in their study, 71 eyes of 68 patients with vitreous haze and poor retinal visualization were investigated with ultrasound B – scan. Causes for the vitreous haze was due to vitreous hemorrhage in

45 (63%) eyes, inflammatory floaters in 20 (28%) eyes and dense degenerative floaters in 6 (9%) eyes

» Asteroid Hyalosis was found in 12% of cases. This condition is characterized by calcium-lipid deposits within the vitreous body. Although it is usually benign and asymptomatic, in some cases, it may contribute to visual disturbance or be confused with other pathologies like vitreous hemorrhage. Ultrasonography is an excellent tool to differentiate asteroid hyalosis from other vitreous abnormalities.

» Mohamed *et al.* l study asteroid hyalosis (AH) 12(14.3%)was detected in 100 patient with help of B-Scan.

» P Sree Lakshmi *et al.* in their study, 71eyes of 68 patients with vitreous haze and poor retinal visualization were investigated with ultrasound B – scan. Causes for the vitreous haze was due to Asteroid hyalosis in 3 eyes.

- **Posterior Staphyloma** was accounted in 8% cases. Its an abnormal outpouching of the sclera at the posterior pole of the eye, often associated with conditions such as high myopia. It results in the thinning and stretching of scleral tissue, leading to potential visual problems. Important precautions should be taken when patients with Posterior Staphyloma are taken for cataract surgery, such as precaution while giving Ocular Anesthesia, consideration specialized surgical techniques or devices if the staphyloma significantly affects the anterior segmentor lens positioning.

» P Sree Lakshmi *et al.* in their study, 71eyes of 68 patients with vitreous haze and poor retinal visualization were investigated with ultrasound B – scan. Causes for the vitreous haze was due to Posterior staphyloma in 2 eyes.

In 8% of patients, no significant abnormality was detected on ultrasonography. This highlights the utility of ultrasonography as a confirmatory tool, helping to rule out serious pathologies when the clinical presentation is unclear due to media opacity.

- Gupta, P. Chhabra *et al.* demonstrated that ultrasonography is crucial for detecting retinal detachments, vitreous hemorrhage, and intraocular masses in cases of dense cataracts and vitreous opacities. It showed a diagnostic accuracy of 93% when compared with post-surgical findings, emphasizing its reliability for surgical planning.
- S. Ramesh, M. Singh concluded with the research focused on eyes with conditions like dense cataracts and vitreous hemorrhage, showing that B-scan ultrasonography successfully identified retinal detachments and choroidal masses. The results highlighted its role in guiding timely interventions in 85% of the cases studied.
- J. Lee, K. Park *et al.* reported a 90% accuracy rate in diagnosing vitreous hemorrhage, retinal detachment, and choroidal melanoma in patients with advanced cataracts and corneal scars. They highlighted that ultrasonography is indispensable in planning surgeries and determining the prognosis of the condition.

CONCLUSION

Ultrasonography, particularly B-scan, is an indispensable tool for assessing posterior segment pathology in patients with hazy ocular media. It provides crucial information for the diagnosis and management of conditions such as posterior vitreous detachment, retinal detachment, vitreous hemorrhage, and asteroid hyalosis. This study emphasizes the need for routine ultrasonographic evaluation in cases where clinical examination is compromised by media opacity.

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