



Clinical profile of visual disturbances in alcohol abuse: A cross-sectional observational study in a forensic medicine unit.

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Abstract

Background:

Alcohol abuse is a major public health issue with significant neuro-ophthalmic implications. Visual disturbances are often underrecognized in chronic alcohol users, yet they may serve as important clinical markers of toxicity and chronic damage. This study aimed to evaluate the clinical spectrum and ocular findings associated with alcohol abuse in patients presenting to a forensic medicine unit.

Methods:

This observational study included 100 individuals with a history of alcohol abuse presenting with visual complaints. Demographic details, duration and pattern of alcohol use, presenting visual symptoms, and ocular examination findings were systematically documented. Descriptive statistics were applied to analyze the data, and results were expressed as frequencies and percentages.

Results:

The mean age of participants was 37.8 ± 9.4 years, with most cases in the 30–39 year group. Males predominated (82%). Chronic heavy alcohol use was reported in 64% of cases, with a mean duration of 8.1 ± 3.1 years. The most frequent symptoms were blurred vision (42%), diplopia (18%), photophobia (15%), and transient visual obscurations (12%). Less common complaints included reduced visual acuity (10%), color vision defects (2%), and visual hallucinations (1%). Ocular findings included conjunctival congestion (28%), nystagmus (16%), sluggish pupillary reflexes (14%), optic disc pallor (12%), hyperemia (8%), and retinal hemorrhages (5%). Seventeen percent of participants had normal ocular examinations despite subjective complaints.

Conclusion:

Visual disturbances are common among individuals with alcohol abuse. Both reversible and irreversible ocular changes were observed, highlighting the importance of early ophthalmic evaluation in this population.

Recommendations:

Routine ophthalmic screening should be integrated into de-addiction and rehabilitation programs. Multidisciplinary collaboration between ophthalmologists, psychiatrists, and forensic specialists is essential to prevent long-term visual morbidity.

Keywords: Alcohol abuse, Visual disturbances, Ocular findings, Forensic medicine

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Introduction

Alcohol abuse remains a pervasive global health problem, contributing significantly to morbidity, mortality, and socioeconomic burden. The World Health Organization estimates that harmful alcohol use accounts for over 3 million deaths annually, making it one of the leading causes of preventable disease and disability worldwide [1]. Beyond its systemic effects on the liver, cardiovascular system, and central nervous system, chronic alcohol abuse also has profound yet underexplored consequences on ocular health and vision [2].

Visual disturbances are among the earliest neuro-ophthalmic manifestations of alcohol toxicity. The spectrum of ocular involvement ranges from reversible complaints such as blurred vision, diplopia, and photophobia to more serious sequelae, including optic neuropathy, retinal vascular changes, and visual field defects [3,4]. These disturbances may not only impair daily functioning but also serve as critical indicators of chronic neurotoxicity and nutritional deficiency, particularly thiamine deficiency, which is strongly associated with alcohol-related optic neuropathy [2,5].

In clinical practice, visual complaints in alcohol-abusing populations are often overlooked, attributed to systemic illness, or dismissed as transient. However, such disturbances may signal irreversible ocular or neurological damage if not identified and addressed early [3]. In forensic medicine units, where alcohol-related cases are frequently encountered, systematic evaluation of ocular manifestations holds medico-legal importance, as it may influence both clinical diagnosis and the documentation of disability [1,4]. Despite these implications, literature focusing on the detailed clinical profile of visual disturbances among individuals with alcohol abuse remains limited, particularly in the Indian context. Understanding the patterns of symptoms and ocular findings in this vulnerable population is essential for timely intervention, prevention of permanent visual loss, and integration of ophthalmic evaluation into de-addiction services.

The present study was undertaken to evaluate the demographic characteristics, spectrum of visual disturbances, and ocular examination findings among individuals with alcohol abuse presenting to a forensic medicine unit.

Methodology

Study Design and Setting:

This was an observational, cross-sectional study conducted in the Department of Forensic Medicine and Toxicology at

the Government Medical College (GMC) and Government General Hospital (GGH), Suryapet, Telangana. GMC Suryapet is a tertiary-level government teaching institution catering to both urban and rural populations of South Telangana, with well-established departments in clinical, paraclinical, and basic sciences. The attached Government General Hospital serves as a 500-bed tertiary referral center providing emergency, inpatient, and outpatient services, including a dedicated de-addiction unit and ophthalmology department. The study was carried out over twelve months, from January 2024 to December 2024, utilizing the routine clinical and forensic caseload for participant recruitment.

Study Population:

A total of 100 individuals with a documented history of alcohol abuse who presented with visual disturbances to the forensic medicine unit during the study period were included.

Study Size:

The sample size of 100 participants was determined based on the average monthly inflow of alcohol-related cases observed in the Forensic Medicine Unit during the preceding year, combined with feasibility considerations and available study duration. Previous similar observational studies on alcohol-related ocular manifestations have included 60–120 participants, demonstrating that a sample of 100 would be sufficient to describe the clinical spectrum with adequate precision [6,7]. This pragmatic sample ensured representativeness of the regional population while maintaining statistical reliability for descriptive analysis.

Inclusion Criteria:

Adults aged 20–60 years with a history of alcohol abuse. Patients presenting with subjective visual complaints (e.g., blurred vision, diplopia, photophobia, reduced vision). Willingness to provide informed consent for participation.

Exclusion Criteria:

Patients with pre-existing ocular diseases unrelated to alcohol abuse (e.g., glaucoma, cataract, diabetic retinopathy).

Individuals with systemic illnesses known to independently affect vision (e.g., uncontrolled diabetes, hypertension).

Uncooperative individuals or those unwilling to undergo ophthalmic evaluation.

Data Collection:

Demographic details, including age and gender, were recorded. A detailed history of alcohol consumption was



obtained, covering duration, pattern (chronic heavy or moderate use), and frequency. Clinical presentation of visual disturbances was documented using structured questionnaires and direct interviews. Comprehensive ocular examination was performed, including visual acuity assessment, pupillary reactions, extraocular movements, slit-lamp evaluation, and fundus examination with direct ophthalmoscopy.

Outcome Measures:

The primary outcomes included the frequency and type of visual disturbances reported, and the ocular examination findings attributable to alcohol abuse.

Data Analysis:

All collected data were entered into Microsoft Excel and analyzed using SPSS software version 26.0 (IBM Corp., Armonk, NY, USA). Descriptive statistics such as means, standard deviations, frequencies, and percentages were calculated. Results were presented in tabular form for clarity.

Ethical Considerations:

Institutional Ethics Committee approval was obtained from the Institutional Ethics Committee of Government Medical

College (GMC) and Government General Hospital (GGH), Suryapet, Telangana, before the commencement of the study. Written informed consent was obtained from all participants, ensuring confidentiality, anonymity, and voluntary participation in accordance with the Declaration of Helsinki.

Results

Participant Flow

During the twelve-month study period (January–December 2024), a total of 128 individuals with a documented history of alcohol use presented to the forensic medicine unit with possible visual complaints. Of these, 116 were examined for eligibility. 12 individuals were excluded: 5 due to pre-existing ocular diseases unrelated to alcohol abuse (e.g., diabetic retinopathy, glaucoma), 4 with systemic illnesses affecting vision (e.g., uncontrolled diabetes, hypertension), and 3 who declined ophthalmic evaluation. After screening, 104 participants were eligible, of whom 100 consented and were finally included in the study. All participants completed ocular assessment and data collection; there were no dropouts or incomplete records, and all were included in the final analysis (Figure 1).

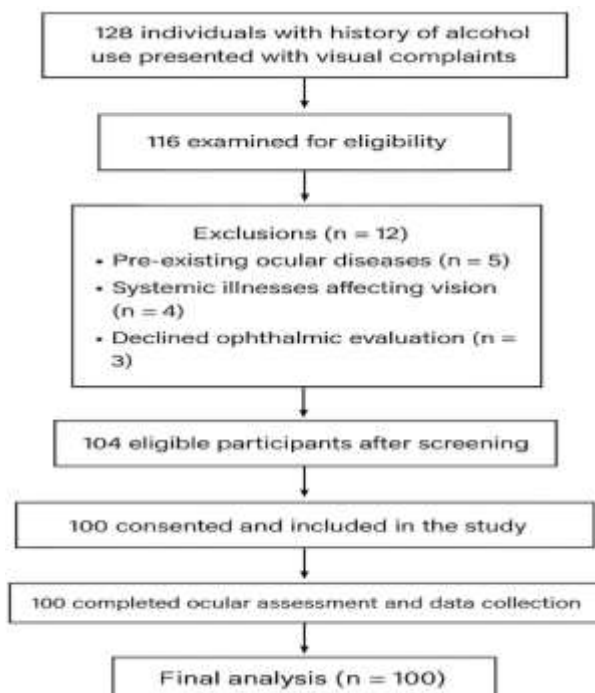


Figure 1. Participant Flow Diagram



A total of 100 individuals with alcohol presenting with visual disturbances were studied. The mean age of participants was 37.8 ± 9.4 years, with the majority

belonging to the 30–39 year age group (34%). Males constituted 82% of the study population, while females accounted for 18% (Table 1).

Table 1. Demographic Profile of Participants (N = 100)

Variable	Frequency (n)	Percentage (%)
Age Group (years)		
20–29	22	22.0
30–39	34	34.0
40–49	28	28.0
50–60	16	16.0
Gender		
Male	82	82.0
Female	18	18.0
Mean Age ($\pm$SD)	37.8 ± 9.4	–

A total of 100 participants with alcohol abuse were included. Among them, 64% reported chronic heavy use, with a mean duration of 8.1 ± 3.1 years (Table 2).

Table 2. Pattern of Alcohol Use

Alcohol Use Pattern	Frequency (n)	Percentage (%)	Mean Duration (Years $\pm$ SD)
Chronic heavy users	64	64.0	8.1 ± 3.1
Occasional/moderate users	36	36.0	4.5 ± 2.2

The most frequent clinical manifestation was blurred vision (42%), followed by diplopia (18%), photophobia (15%), and transient visual obscurations (12%). Less common

complaints included reduced visual acuity (10%), color vision defects (2%), and visual hallucinations (1%) (Table 3).

Table 3. Clinical Profile of Visual Disturbances

Visual Disturbance	Frequency (n)	Percentage (%)
Blurred vision	42	42.0
Diplopia	18	18.0
Photophobia	15	15.0
Transient visual obscurations	12	12.0
Reduced visual acuity	10	10.0
Color vision defects	2	2.0
Visual hallucinations	1	1.0

On ocular examination, conjunctival congestion was the most prevalent finding (28%), followed by nystagmus (16%) and sluggish pupillary reflexes (14%). Optic disc changes were also noted, including pallor (12%) and hyperemia (8%),

while retinal hemorrhages were documented in 5% of participants. Interestingly, 17% of individuals reported symptoms but had no abnormal ocular findings (Table 4).



Table 4. Ocular Examination Findings

Examination Findings	Frequency (n)	Percentage (%)
Conjunctival congestion	28	28.0
Nystagmus	16	16.0
Sluggish pupillary reflex	14	14.0
Optic disc pallor	12	12.0
Optic disc hyperemia	8	8.0
Retinal hemorrhages	5	5.0
No abnormal findings	17	17.0

Discussion

The present study evaluated the clinical profile of visual disturbances among individuals with alcohol abuse presenting to a forensic medicine unit. The study findings demonstrate that visual complaints are frequent and clinically significant in this population, consistent with earlier studies highlighting the association between alcohol abuse and optic neuropathy [6,7].

In this study, blurred vision was the most common symptom (42%), followed by diplopia (18%) and photophobia (15%). Similar trends were noted in case series documenting alcohol-related toxic optic neuropathy, where blurred vision and gradual loss of visual acuity were predominant complaints [8]. These symptoms are believed to result from both the direct neurotoxic effects of alcohol and nutritional deficiencies, particularly thiamine-related optic neuropathy [7,9].

Ocular examination revealed conjunctival congestion (28%) as the most frequent finding, likely reflecting acute intoxication and vascular irritation. Nystagmus was observed in 16% of cases, which aligns with reports of gaze-evoked nystagmus occurring during alcohol intoxication due to cerebellar and central vestibular dysfunction [10]. Sluggish pupillary reflexes (14%) also suggest central nervous system involvement. Importantly, optic disc pallor was documented in 12% of participants, a finding consistent with long-term alcohol abuse leading to chronic and often irreversible optic nerve damage [6,8]. The vascular component of alcohol-related ocular damage was evident from cases of optic disc hyperemia and retinal hemorrhages, as described in earlier literature [7,12].

Interestingly, 17% of participants reported visual disturbances despite normal ocular findings, which may indicate functional or subclinical changes. Advanced diagnostic modalities such as visual field testing, contrast sensitivity assessment, and optical coherence tomography may be useful in such cases, as emphasized in previous reviews on toxic and nutritional optic neuropathies [7,11].

The demographic pattern of this study, with male predominance (82%) and peak incidence in the 30–39 year age group, is consistent with earlier epidemiological surveys and clinical studies reporting higher alcohol use and related optic neuropathies among men in their most productive years [6,9]. Furthermore, emerging evidence suggests that genetic predisposition may play a role in the susceptibility to optic neuropathy in patients with alcohol use disorder [9], which could explain the variability in clinical manifestations across individuals.

The medico-legal implications of these findings are noteworthy. Forensic medicine units frequently encounter alcohol-related cases, and recognition of associated visual disturbances is important for medico-legal documentation of disability, assessment of intoxication-related impairment, and correlation with the cause of death in fatal cases. Reports on Wernicke's encephalopathy emphasize that timely recognition of neuro-ophthalmic features can be life-saving [11]. Additionally, recent work on disulfiram-induced optic neuropathy underscores the importance of considering alcohol-related and drug-related visual complications in both clinical and forensic practice [14]. Overall, integrating ophthalmic evaluation into de-addiction programs is essential to reduce long-term visual morbidity. Public health policies must address awareness, screening, and early treatment to prevent irreversible outcomes, a recommendation supported by multiple clinical studies and systematic reviews on toxic and nutritional optic neuropathies [7,13].

Generalizability

The findings of this study, conducted at a tertiary care forensic medicine unit in Suryapet, Telangana, provide valuable insights into the spectrum of visual disturbances associated with alcohol abuse. While the results reflect patterns observed in similar clinical and forensic settings across India, generalizability to broader populations should be interpreted cautiously. Factors such as regional variations in alcohol consumption, socioeconomic influences, and



access to healthcare may influence presentation and outcomes. Nevertheless, the study underscores trends that are likely applicable in comparable low- and middle-income country (LMIC) settings where alcohol misuse remains widespread.

Conclusion

This study highlights that visual disturbances are frequent yet often overlooked complications among individuals with alcohol abuse. The most common manifestations included blurred vision, diplopia, and photophobia, while ocular findings ranged from conjunctival congestion and nystagmus to optic disc changes and retinal hemorrhages. Both reversible and irreversible patterns were noted, underscoring the importance of incorporating routine ophthalmic evaluation into de-addiction and rehabilitation services. Early recognition and intervention may prevent long-term visual disability, improve patient quality of life, and aid forensic documentation. Multidisciplinary collaboration remains essential for the holistic management of this vulnerable population.

Strengths and Limitations

The strength of this study lies in its systematic evaluation of both clinical symptoms and ocular examination findings in a forensic setting. However, limitations include its cross-sectional design, single-center setting, and reliance on basic ophthalmic tools without advanced imaging modalities. Longitudinal studies with larger samples are required to establish causal associations and monitor the reversibility of visual disturbances after abstinence.

Recommendations

Routine ophthalmic evaluation should be integrated into the clinical assessment of individuals with alcohol abuse, particularly in forensic and de-addiction settings. Early detection of visual disturbances can help prevent irreversible complications such as optic neuropathy and retinal damage. Multidisciplinary collaboration between ophthalmologists, psychiatrists, and forensic specialists is essential for holistic care. Public health initiatives must include awareness programs highlighting the ocular risks of alcohol abuse. Further, policies should encourage routine screening during rehabilitation, and future multicentric longitudinal studies are recommended to explore the reversibility of visual disturbances following abstinence and nutritional interventions.

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Abbreviations

LMICs – Low- and Middle-Income Countries
SPSS – Statistical Package for the Social Sciences
SD – Standard Deviation
CNS – Central Nervous System

Source of funding

The study had no funding.

Conflict of interest

The authors declare no conflict of interest.

Author contributions

AKK-Concept and design of the study, results interpretation, review of literature, and preparation of the first draft of the manuscript. Statistical analysis and interpretation, revision of manuscript. **AS**-Design of the study, results interpretation, review of literature, and preparing the first draft of the manuscript.

Data availability

Data available on request

Author Biography

Dr. A. Kranti Kiran obtained his MBBS from S.V.S. Medical College, Mahabubnagar, in 2009, and subsequently earned his MD in Forensic Medicine from Osmania Medical College, Hyderabad (2011–2014). He trained as a Senior Resident at Kakatiya Medical College, Warangal (2014–2015), before serving as Assistant Professor at Katuri Medical College, Guntur (2015–2016), Dr. SMCSI Medical College, Kerala (2016–2017), and ASRAM, Eluru (2017–2018). From 2018 to 2023, he worked under the Telangana Vaidya Vidhana Parishad (TVVP) as a Civil Assistant Surgeon Specialist in Forensic Medicine at AH/CHC Bhongir. Since 2023, he has been an Assistant Professor in the Department of Forensic Medicine at Government



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Her clinical expertise spans the diagnosis and management of corneal diseases, glaucoma, retinal disorders, and uveitis. She has independently performed more than 300 small-incision cataract surgeries, 60 phacoemulsification procedures, over 400 intravitreal injections, and several anterior segment procedures. She is also skilled in laser procedures, including YAG capsulotomy, YAG iridotomy, and retinal photocoagulation.

Dr. Shireesha has served as Assistant Professor of Ophthalmology at Government Medical College, Nalgonda, and has prior experience as Senior Resident at Mallareddy Institute of Medical Sciences and Junior Consultant at Pushpagiri Vitreoretinal Institute.

She has contributed to peer-reviewed publications in the *Indian Journal of Ophthalmology*, *Indian Journal of Rheumatology*, and *Hepatology Communications*, with research focusing on optic neuropathies, retinal diseases, and systemic associations of ocular pathology. Her professional interests include retinal diseases, neuro-ophthalmology, and medical education. **ORCID iD:** <https://orcid.org/0009-0001-4458-5085>

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