A

DISSERTATION

ON

"Comparative Management of Mucosal-Type Chronic Suppurative Otitis Media with 2% Acetic Acid and Ciplox Ear Drops: A Prospective Observational Study"

SUBMITTED

TO

IN

THE ACADEMIC YEAR

“Comparative Management of Mucosal-Type Chronic Suppurative Otitis Media with 2% Acetic Acid and Ciplox Ear Drops: A Prospective Observational Study”

NAME OF COURSE	**:**	**M.S.**
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ABSTRACT

Background: Chronic suppurative otitis media (CSOM) is a persistent middle ear infection characterized by recurrent or continuous ear discharge through a perforated tympanic membrane and is a significant cause of preventable hearing loss, particularly in developing countries. Effective medical management aims to control infection, achieve a dry ear, and promote recovery of middle ear mucosa and healing of the tympanic membrane. Topical antibiotic therapy such as ciprofloxacin is commonly used; however, acidifying agents like acetic acid have been shown to inhibit bacterial growth and disrupt biofilm formation in chronic ear infections. Considering the increasing concern regarding antibiotic resistance and treatment costs, evaluating alternative topical therapies such as acetic acid is clinically important.

Aims and Objectives: [redacted]

Materials and Methods: [redacted]

Results: [redacted]

Conclusion: [redacted]

Keywords: Chronic suppurative otitis media, Acetic acid ear drops, Ciprofloxacin ear drops, Mucosal CSOM, Dry ear, Tympanic membrane healing, Middle ear mucosa, Topical therapy, Ear discharge, Otitis media management.

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INTRODUCTION

INTRODUCTION

The World Health Organization defines chronic suppurative otitis media (CSOM) as persistent purulent ear discharge through a perforated tympanic membrane for a sustained period, typically beyond two weeks. [redacted]

[redacted] Any effective regimen must therefore address both the microbial spectrum and the altered local environment that favours chronicity, while remaining safe for use in the presence of a non-intact drum(5).

Standard care emphasizes two foundational elements: aural toilet and topical medication. Suction-assisted cleaning to remove discharge and debris is not merely preparatory; it is therapeutic, improving drug penetration to mucosal surfaces and reducing the biomass that shelters organisms. [redacted]

the twin goals of disease control and tissue healing. They also carry practical implications, such as readiness for elective tympanoplasty, reduced need for repeat medical visits, and improved hearing outcomes as conductive pathways are restored or optimized. Because recurrences are common, follow-up across weeks to months is necessary to distinguish transient drying from sustained resolution(12).

In sum, this introduction situates the study within the core challenges of mucosal CSOM and articulates why its findings could meaningfully shape everyday otologic care.

Global Epidemiology (CSOM)

The global burden of chronic suppurative otitis media (CSOM) is substantial and concentrated in low- and middle-income countries. Overall,

hearing loss linked to CSOM accounts for the major share of otitis media disability-adjusted life-years (DALYs) globally(15,16).

India Epidemiology

India is repeatedly classified in the high-prevalence zone for CSOM. [redacted] In Indian paediatric series, the mucosal (tubotympanic) phenotype predominates [redacted] matching the clinical focus of the present study(17–19).

Maharashtra Epidemiology

State-level, community-based prevalence estimates are fewer but align with the national range and its rural–urban pattern. [redacted] Together, these data suggest Maharashtra mirrors India's urban–rural gradient and mucosal phenotype predominance (20).

AIMS AND OBJECTIVES

AIMS AND OBJECTIVES

AIM:

[redacted]

OBJECTIVES:

[redacted]

REVIEW OF LITERATURE

REVIEW OF LITERATURE

Definition of Otitis Media

Otitis media refers to inflammation or infection of the middle ear cleft, which includes the eustachian tube, tympanic cavity, aditus, and mastoid air cells. [redacted]

- Involves inflammation or infection of the middle ear cleft

[redacted]It also influences the choice of therapymedical versus surgicaland determines the prognosis(21,22).

WHO Definition of Chronic Suppurative Otitis Media (CSOM)

According to the World Health Organization (WHO), chronic suppurative otitis media (CSOM) is defined as “a chronic inflammation of the middle ear and mastoid cavity, which

presents with recurrent ear discharges through a tympanic membrane perforation, lasting for more than two weeks.” [redacted]

- Defined by WHO as ear discharge lasting >2 weeks through a perforated tympanic membrane

[redacted] WHO also advocates for preventive strategies including improved hygiene, awareness, and access to affordable care(23).

Anatomy of the External, Middle, and Inner Ear

The human ear is anatomically divided into three major sections: the external ear, middle ear, and inner ear. [redacted]

[redacted]

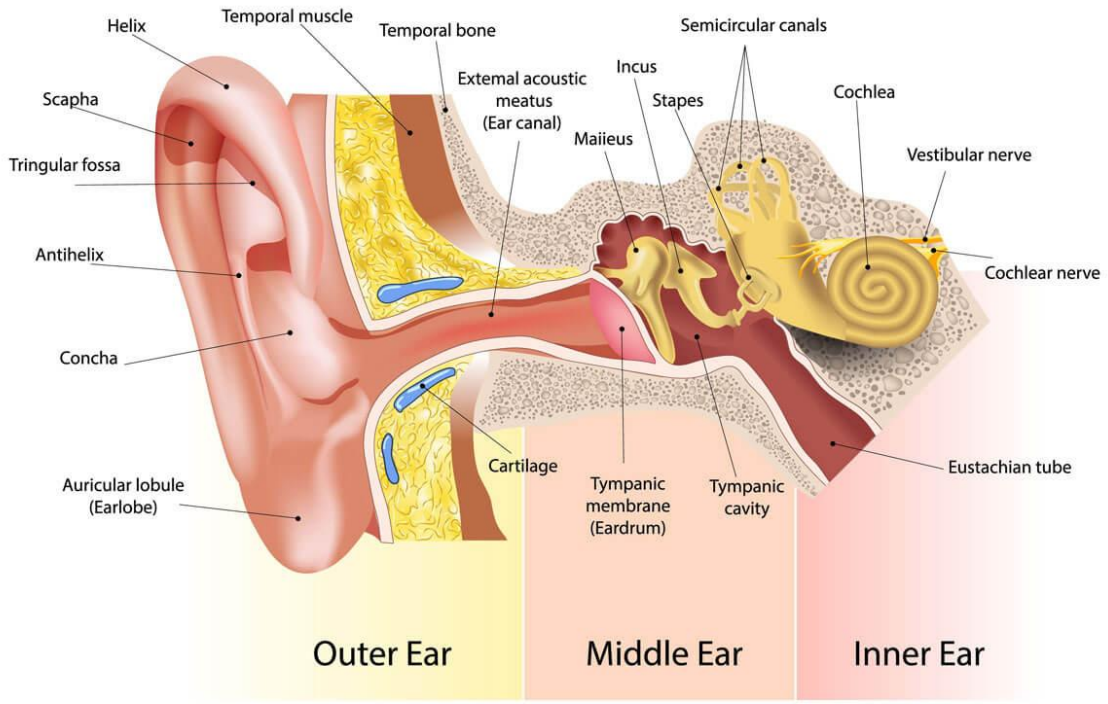


Fig 1: Anatomy of the External, Middle, and Inner Ear

Section	Components	Function
[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]

Structure and Function of the Eustachian Tube

The eustachian tube is a dynamic passage connecting the middle ear to the nasopharynx.

[redacted]

[redacted]

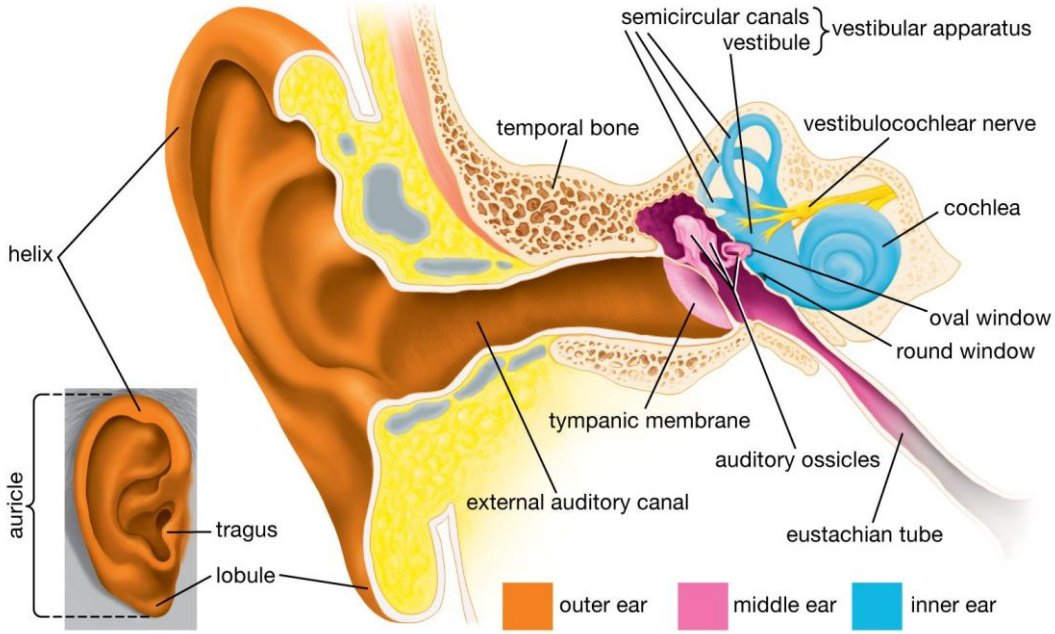


Fig 2: Anatomy of Eustachian Tube

- Equalizes pressure between the middle ear and atmosphere

[redacted]

[redacted]

[redacted] Eustachian tube dysfunction is a key pathological factor in most middle ear diseases seen in ENT clinics (26).

Tympanic Membrane: Layers and Vascular Supply

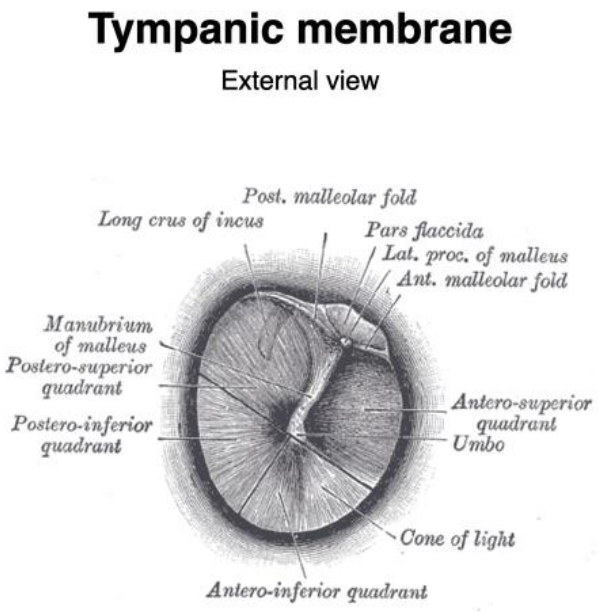


Fig 3: Tympanic Membrane

The tympanic membrane (TM), or eardrum, is a delicate, semi-transparent structure that separates the external auditory canal from the middle ear cavity. [redacted]

- Composed of three layers: epithelial, fibrous, and mucosal

[redacted]

Otoscopic examination of the TM is the first and most vital step in ENT clinical evaluation (28).

Middle Ear Mucosa and Gas Exchange

The middle ear cavity is lined by respiratory-type mucosa similar to that of the nasopharynx.

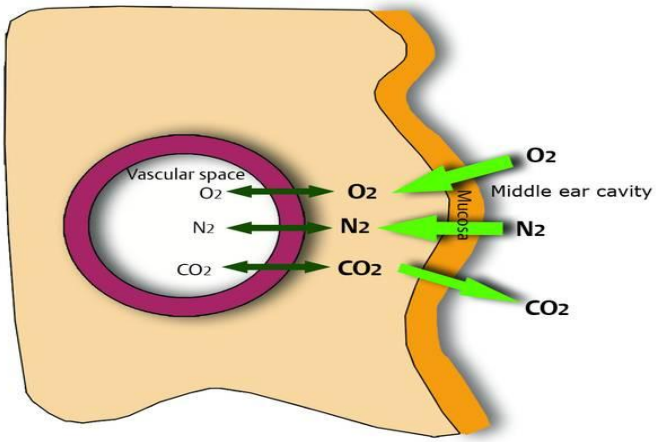


Fig 4: Pathophysiology and ventilation of Middle Ear

Classification: Acute, Chronic, Recurrent

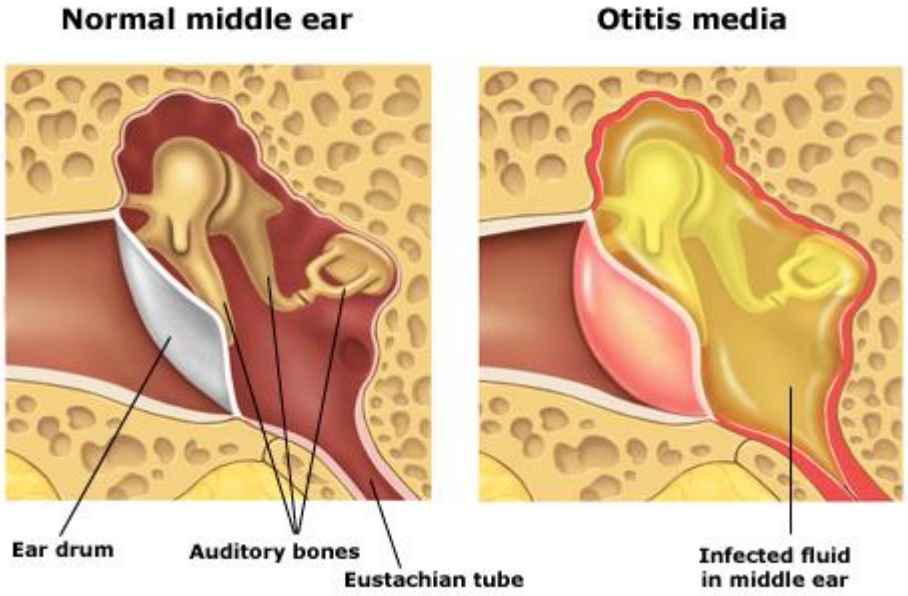


Fig 5: Otitis media

Otitis media can be categorized based on duration, recurrence, and pathological features.

[redacted]

- Acute Otitis Media: Rapid onset, short duration (under 3 weeks), usually self-limiting

[redacted]

[redacted]

[redacted]

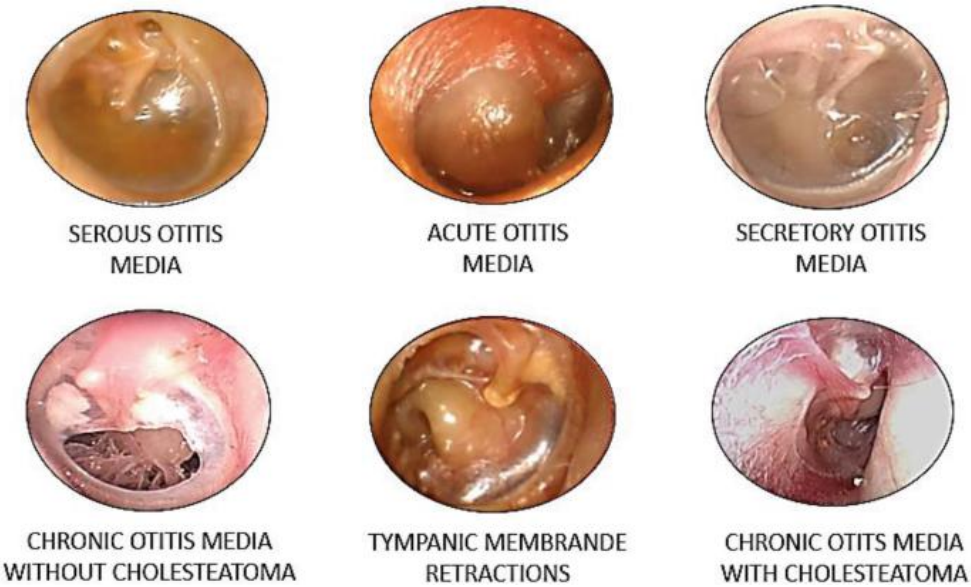


Fig 6: Types of Chronic Otitis Media

Subtypes: Mucosal (Tubo-tympanic) vs Squamosal (Atticoantral)

Chronic suppurative otitis media (CSOM) is further divided into two pathological subtypes: mucosal (also known as tubo-tympanic) and squamosal (also known as atticoantral). [redacted]

- Mucosal type (tubo-tympanic): Central perforation, safe type, often treatable conservatively

Fig 7: Subtypes: Mucosal (Tubo-tympanic) vs Squamosal (Atticoantral)

Recognizing the correct subtype is critical in ENT clinical practice, as it determines the urgency of intervention and the need for imaging or surgical planning.

Clearance Mechanisms: Ciliary Action and Mucociliary Transport

The middle ear mucosa has a crucial clearance function maintained through ciliary motion and mucociliary transport.

- Ciliary beating clears mucus and foreign particles

[redacted] These clearance mechanisms are central to understanding disease chronicity and recurrence in CSOM(35).

Chronic Infection and Mucosal Damage

Fig 8: Chronic Infection and Mucosal Damage

Chronic suppurative otitis media (CSOM) is characterized by a prolonged and unresolved middle ear infection that leads to continuous mucosal inflammation and degradation. [redacted]

[redacted]

Feature	Pathological Change
[redacted]	[redacted]
[redacted]	[redacted]
[redacted]	[redacted]
[redacted]	[redacted]

Persistent Perforation and Microbial Colonization

A hallmark of mucosal CSOM is a long-standing tympanic membrane perforation, which serves as a continuous gateway for microbial colonization of the middle ear. [redacted]

ENT management involves aural toilet, culture-guided topical drops, and promoting TM healing. [redacted]

Element	Description
[redacted]	[redacted]
[redacted]	[redacted]
[redacted]	[redacted]
[redacted]	[redacted]

Development of Granulation Tissue

Chronic inflammation in CSOM often leads to the development of granulation tissue within the middle ear. [redacted]

In ENT clinics, granulations are removed via suction or chemical cautery (e.g., with trichloroacetic acid), followed by antibiotic-steroid ear drops. [redacted]

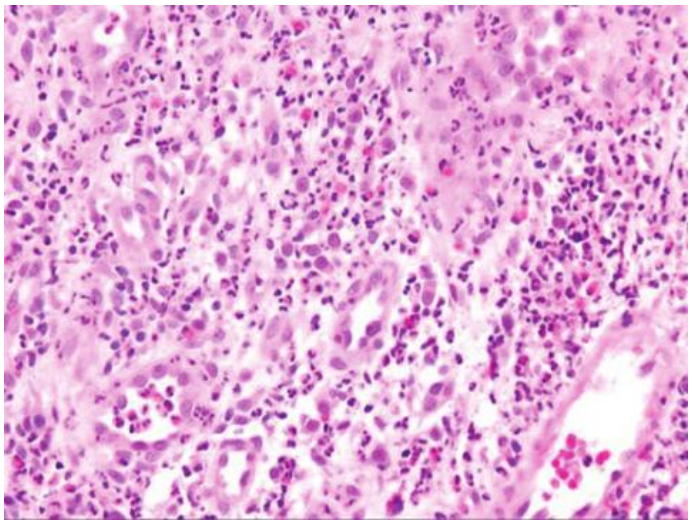


Fig 9: **Chronic inflammatory mucosa with granulation tissue.**

Formation of Biofilms

Biofilms are structured communities of bacteria enclosed within a self-produced extracellular matrix that adhere to surfaces like middle ear mucosa and ossicles. [redacted]

- Biofilms provide mechanical protection to bacteria
- Reduce penetration of antibiotics and host defences

[redacted]

Changes in Middle Ear Microenvironment

Chronic infection in CSOM causes several changes in the middle ear's internal environment, including persistent moisture, lowered oxygen tension, and acidic ph. [redacted]

Environmental Change	Effect on Middle Ear
[redacted]	[redacted]
[redacted]	[redacted]
[redacted]	[redacted]
[redacted]	[redacted]

Clinical Features

Otorrhoea: Type, Colour, Consistency

Otorrhoea is the hallmark symptom of chronic suppurative otitis media (CSOM), defined as persistent or intermittent discharge from the ear through a tympanic membrane perforation. [redacted]

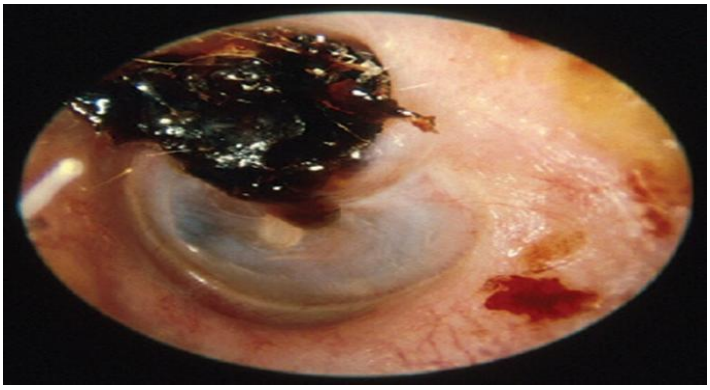


Fig 10: Otorrhoea

Hearing Loss: Degree, Type, Duration

Hearing loss in CSOM is primarily conductive and results from disruption of the ossicular chain, tympanic membrane perforation, or presence of middle ear fluid. [redacted]

- Long-standing disease may lead to mixed hearing loss
- Sudden worsening may suggest ossicular necrosis or cholesteatoma

[redacted]

Associated Symptoms: Tinnitus, Ear Fullness, Vertigo

In addition to discharge and hearing loss, patients with CSOM may experience associated symptoms that provide clues about disease extent and severity. [redacted]

Symptom	Possible Cause in CSOM
[redacted]	[redacted]
[redacted]	[redacted]
[redacted]	[redacted]
[redacted]	[redacted]

Otoscopic Findings: Mucosal Edema, Granulations, Polyps

Otoscopic or microscopic examination of the ear in CSOM reveals vital diagnostic features. [redacted]

Finding	ENT Significance
[redacted]	[redacted]
[redacted]	[redacted]
[redacted]	[redacted]
[redacted]	[redacted]

Tympanic Membrane: Site and Size of Perforation

The tympanic membrane (TM) perforation in mucosal CSOM is typically central, involving the pars tensa, and varies in size. [redacted]

Location	Impact on Treatment

Audiological Assessment: Pure Tone Audiometry, Tympanometry

Audiological evaluation is an indispensable part of CSOM management in ENT.

- Tympanometry Type B is common in active CSOM with perforation

Test	Findings in CSOM

Microbiology and Local Pathogen Profile

Common Bacterial Isolates: Pseudomonas, Staph aureus, Klebsiella

Chronic suppurative otitis media (CSOM), particularly the mucosal type, is commonly associated with colonization by aerobic gram-negative and gram-positive bacteria. [redacted]

Organism	Characteristics	Clinical Relevance
[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]

Fungal Colonization in Recurrent Otorrhoea

Fungal involvement in CSOM is more likely in patients who have received prolonged or repeated courses of topical or systemic antibiotics, which alter the normal flora. [redacted]

Fungal Species	Appearance in Ear	Associated Features

Anaerobes and Mixed Flora

Anaerobic bacteria are also implicated in CSOM, especially in chronic, deep-seated infections or cases with foul-smelling discharge.

- Not detected on routine aerobic cultures unless specifically requested

Role of Biofilms in Treatment Resistance

Biofilms are complex aggregates of bacteria embedded in a self-produced extracellular matrix, which adhere to the middle ear mucosa and ossicular structures.

- Biofilms reduce drug penetration and enable chronic colonization

Biofilms explain the need for prolonged therapy or surgery in some ENT patients. Disrupting them often requires mechanical debridement, in addition to medical management(55).

ENT Relevance: Swab Collection and Culture Interpretation

Microbiological diagnosis in CSOM depends heavily on correct collection and interpretation of ear swabs.

- Empirical therapy may be continued until results are available

[redacted] Accurate reporting and sensitivity-based treatment improve outcomes (4).

Complications of Untreated or Chronic CSOM

Intratemporal Complications

Chronic suppurative otitis media (CSOM) can give rise to several intratemporal complications if untreated or inadequately managed. [redacted] These conditions pose an immediate risk to patient health and often require hospitalization, intravenous antibiotics, and surgical intervention(2).

- [redacted]**Mastoiditis**: [redacted]
- **Labyrinthitis**: [redacted]
- **Facial Nerve Palsy**: [redacted]

[redacted] Prompt recognition and surgical drainage, such as cortical mastoidectomy, are essential to prevent progression(56).

Intracranial Complications

Intracranial extension of infection from the middle ear is one of the most feared outcomes of neglected CSOM, more likely in cases with cholesteatoma or squamosal disease. [redacted]

- **Meningitis**: [redacted]

[redacted]**Brain Abscess**: [redacted]

[redacted]**Lateral Sinus Thrombosis**: [redacted]

[redacted]

Other Notable Complications

Aside from intratemporal and intracranial involvement, CSOM is associated with several additional local structural complications that may impact long-term ear function. [redacted]

Cholesteatoma:

Ossicular Erosion:

Tympanosclerosis:

Diagnostic Evaluation

ENT Clinical History Taking for CSOM

A comprehensive and targeted clinical history is the cornerstone of diagnosing chronic suppurative otitis media (CSOM) in otorhinolaryngology.

- Duration and nature of otorrhoea (intermittent/continuous)

[redacted] It also helps assess disease chronicity, severity, and likelihood of complications(61).

Otoscopy and Aural Endoscopy

Direct visualization of the external auditory canal and tympanic membrane is essential in CSOM evaluation. [redacted]

- Otoscopy reveals perforation location, mucosal condition, discharge

  [redacted]

[redacted] ENT specialists document findings in structured diagrams or digital imaging systems(62).

Microscopic Examination Under Operating Microscope

Microscopic examination using a surgical operating microscope provides binocular magnification and superior illumination of the tympanic membrane and middle ear. [redacted]

- Enables differentiation between granulations and polyps

Culture and Sensitivity Testing of Discharge

Microbiological examination of ear discharge plays a critical role in the effective treatment of CSOM, especially in recurrent or non-responsive cases.

- Swab collection must follow aural cleaning to ensure accurate results

It also aids in identifying resistant infections that may require surgical management(64).

Audiological Evaluation: PTA, Impedance Audiometry

Audiological tests are vital in assessing the functional impact of CSOM and in planning further management. [redacted]

- PTA quantifies hearing loss and detects air-bone gap

[redacted]

Imaging (if needed): HRCT Temporal Bone

High-resolution computed tomography (HRCT) of the temporal bone is reserved for complicated, recurrent, or surgical CSOM cases. [redacted]

Imaging Modality	Utility in CSOM	ENT Surgical Planning Role
[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]

Medical Management Principles in ENT

Aural Toilet: Method, Instruments, Frequency

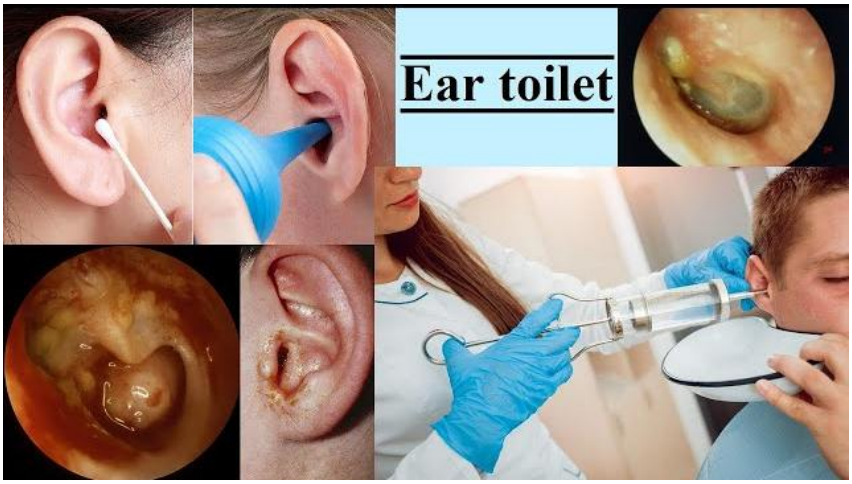


Fig 11: Aural toilet

Aural toilet refers to the process of mechanically cleaning the external auditory canal and middle ear to remove discharge, debris, crusts, or granulations. [redacted]

Fig 12: Mechanical jet ear irrigation system

Topical Drops: Technique, Duration, Precautions

Topical antibiotic or antiseptic ear drops are the first-line treatment in mucosal CSOM. [redacted]

Aspect	Guideline
[redacted]	[redacted]
[redacted]	[redacted]
[redacted]	[redacted]
[redacted]	[redacted]

Role of Systemic Antibiotics (When Indicated)

While topical therapy remains the mainstay of treatment for uncomplicated mucosal CSOM, systemic antibiotics may be necessary in certain cases. [redacted]

- Indicated in cases of systemic involvement or complications

[redacted]

[redacted] ENT specialists often reassess the patient after a short course to decide on further escalation(68).

Antihistamines and Decongestants

Adjunctive use of antihistamines and nasal decongestants is common in the management of CSOM when there is associated eustachian tube dysfunction or allergic rhinitis. [redacted]

Medication	Function
[redacted]	[redacted]
[redacted]	[redacted]
[redacted]	[redacted]

Patient Education and Hygiene

Patient awareness and hygiene are vital in preventing recurrence and achieving sustained recovery in CSOM. [redacted]

- Emphasize ear dryness: no water entry during bathing

[redacted]

ENT care is incomplete without patient cooperation. [redacted]

Acetic Acid 2% Ear Drops

Chemical Composition and pH

Acetic acid ear drops typically contain 2% glacial acetic acid diluted in an aqueous base, often combined with glycerine to reduce surface tension and soothe mucosa. [redacted]

- Contains 2% glacial acetic acid in aqueous or glycerine base

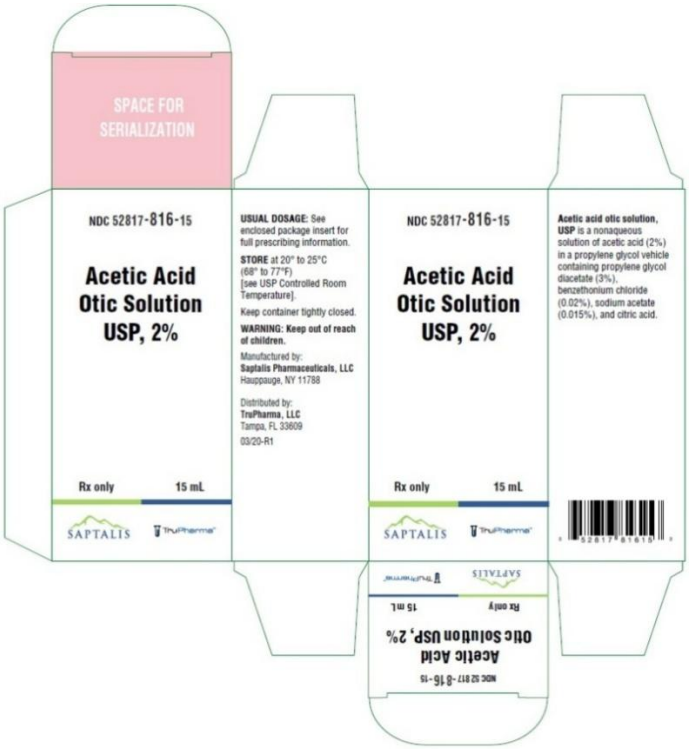


Fig 13: Acetic Acid 2% Ear Drops

Mechanism of Action: Acidic Environment, Biofilm Disruption

The primary mechanism of action of acetic acid is its ability to create a low-pH environment that inhibits bacterial and fungal growth. [redacted]

Target	Mechanism of Disruption
[redacted]	[redacted]
[redacted]	[redacted]
[redacted]	[redacted]
[redacted]	[redacted]

Antibacterial and Antifungal Activity

Acetic acid exhibits broad-spectrum antimicrobial activity against a range of gram-positive, gram-negative, and fungal organisms. [redacted]

- Inhibits growth of Pseudomonas, Staph, Klebsiella, E. coli

[redacted]

ENT Use: Cost-effectiveness, Dry Ear Induction

In ENT practice, especially in resource-constrained environments, 2% acetic acid is valued for its low cost, wide availability, and ease of administration.

- Readily available and inexpensive

Limitations: Local Irritation, Compliance

Despite its efficacy, acetic acid has limitations.

[redacted]

- May cause local irritation, especially in inflamed ear canals

[redacted]

[redacted]In cases with significant discomfort, they may switch to steroid-containing preparations(77).

Ciprofloxacin (Ciplox) Ear Drops

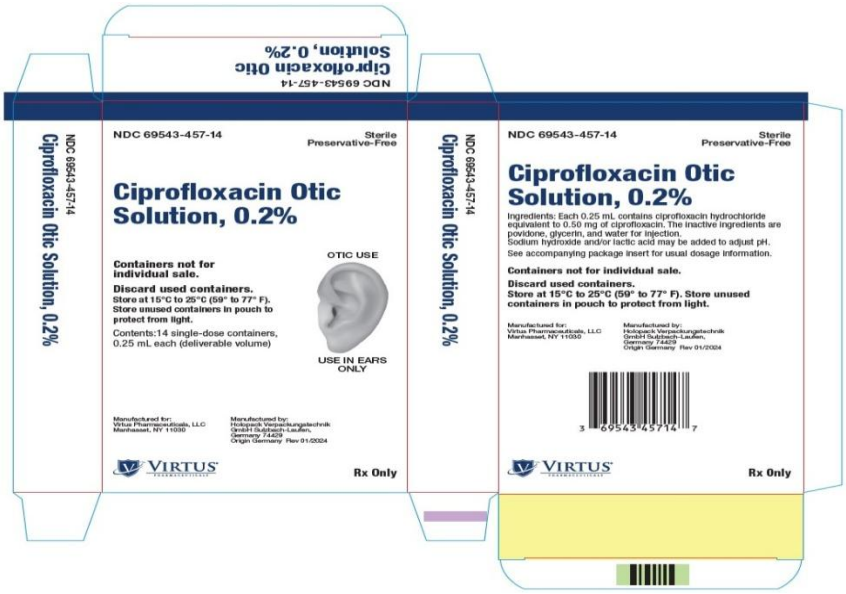


Fig 14: Ciprofloxacin (Ciplox) Ear Drops

Class: Fluoroquinolones

Ciprofloxacin belongs to the class of fluoroquinolone antibioticsbroad-spectrum agents that are widely used in systemic and topical infections. [redacted]

- A second-generation fluoroquinolone antimicrobial

It remains one of the first-line topical antibiotics in mucosal CSOM management, especially in active discharge phases(79).

Mechanism: DNA Gyrase Inhibition

Ciprofloxacin exerts its antimicrobial action by inhibiting bacterial DNA gyrase (topoisomerase II) and topoisomerase IV.

Target Enzyme	Effect of Inhibition
[redacted]	[redacted]
[redacted]	[redacted]
[redacted]	[redacted]
[redacted]	[redacted]

Efficacy Against Gram-negative Pathogens

Ciprofloxacin exhibits excellent activity against a wide range of aerobic gram-negative organisms, including Pseudomonas aeruginosa, Klebsiella pneumoniae, and Escherichia coli. [redacted]

Organism	Response to Ciprofloxacin
[redacted]	[redacted]
[redacted]	[redacted]
[redacted]	[redacted]
[redacted]	[redacted]

ENT Safety Profile in TM Perforation

One of the key advantages of ciprofloxacin ear drops over older agents like gentamicin is its safety in the presence of tympanic membrane perforation. [redacted]

- Considered non-ototoxic and safe for perforated eardrums

Risk of Resistance and Long-Term Use Concerns

Despite its many advantages, long-term or indiscriminate use of ciprofloxacin can contribute to the development of antibiotic resistance.

- Resistance can develop with unsupervised prolonged use

Drug Administration and Patient Instructions

Positioning of the Head and Ear

Correct positioning of the patient is essential for effective delivery of ototopical medications in CSOM. [redacted]

- Patient should lie on the opposite side (affected ear up)

[redacted]This simple step significantly improves treatment efficacy and minimizes wastage(84).

Drop Volume and Frequency

The correct volume and frequency of ear drop instillation are vital to ensure therapeutic levels of the drug at the site of infection. [redacted]

- Standard dose is 2–3 drops per application

Proper counselling about dosage prevents misuse and supports better compliance.

Aural Toilet Prior to Instillation

Performing aural toilet before instilling ear drops ensures that the medication reaches the target mucosa without being impeded by debris, pus, or crusts.

- Clears debris, discharges, and enhances drug contact

Aural toilet is considered the most important adjunct to topical therapy in ENT.

Avoiding Contamination

Maintaining sterility of the ear drop bottle is crucial to prevent introducing new infections during treatment. [redacted]

- Do not touch the dropper tip to any surface or the ear canal

  [redacted]

[redacted]

Compliance Strategies in ENT Practice

Patient adherence to topical ear drop regimens is a common challenge in the management of CSOM. [redacted]

- Educate on importance of completing full course

  [redacted]

Comparative Aspects: Acetic Acid vs Ciprofloxacin

Time to Dry Ear

One of the most important indicators of therapeutic efficacy in chronic suppurative otitis media (CSOM) is the time taken to achieve a "dry ear" defined as the cessation of active otorrhoea.

- Ciprofloxacin achieves dry ear typically within 5–7 days in uncomplicated cases

Rate of Mucosal Recovery

Mucosal recovery in CSOM refers to the resolution of inflammation, granulations, and edema in the middle ear cavity.

Agent	Effect on Mucosa	Ideal Use Scenario

Patient Comfort and Local Reaction

Tolerance and patient acceptability play a key role in adherence to topical therapy.

Agent	Local Reaction	Tolerability

Cost, Accessibility, and Storage

Acetic acid is widely accessible and extremely affordable, making it the agent of choice in low-resource settings, rural health centers, and primary care clinics.

- Acetic acid is inexpensive, often available over the counter

[redacted]

ENT protocols often consider socioeconomic factors before prescribing long-term treatment.

Risk of Ototoxicity or Allergic Reaction

Both agents have a low ototoxicity profile when used correctly. [redacted]

Agent	Ototoxicity Risk	Allergic Reaction
[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]

ENT Preference and Protocols

ENT treatment protocols vary depending on patient profile, discharge characteristics, and accessibility. [redacted]

- Ciprofloxacin is preferred in active CSOM with discharge or granulations

Mucosal Healing and Tympanic Membrane Closure

Assessment of Middle Ear Mucosa (edema, hyperplasia)

Evaluating the condition of the middle ear mucosa is a vital part of CSOM follow-up and directly influences management decisions.

- Edema appears as swollen, congested mucosa with increased vascularity

ENT surgeons evaluate mucosal status regularly during aural toilet and topical treatment.

Indicators of Healing: Reduction in Discharge, Closure of TM

The key indicators of successful medical therapy in CSOM include reduction or cessation of otorrhoea and visible healing of the tympanic membrane. [redacted]

- Decreased frequency and quantity of otorrhoea

[redacted]

[redacted]Persistent discharge after 2–3 weeks warrants re-evaluation of therapy or consideration of surgical options(93).

Role of Medications in Promoting Epithelial Regeneration

Topical medications aid not only in infection control but also in restoring epithelial integrity of the middle ear and tympanic membrane. [redacted]

Medication	Effect on Healing
[redacted]	[redacted]
[redacted]	[redacted]
[redacted]	[redacted]
[redacted]	[redacted]

Otoscopic Follow-up and Documentation

Otoscopy and, where available, otoendoscopy are used in every follow-up visit to monitor mucosal recovery and tympanic membrane healing. [redacted]

- Regular otoscopic evaluation tracks healing progress

  [redacted]

Systematic documentation allows for timely intervention and ensures continuity of care between outpatient visits.

Weekly Evaluation During Therapy

Regular clinical follow-up is essential in the medical management of chronic suppurative otitis media (CSOM). [redacted]

- Weekly ENT visits during active therapy phase

Criteria for Clinical Improvement

Clinical improvement in CSOM is assessed both subjectively and objectively.

- Absence or significant reduction of discharge

Post-Treatment Otoscopy and PTA

At the completion of medical therapy, post-treatment evaluation involves otoscopic examination and audiological testing. [redacted]

- Otoscopy confirms healing status and TM condition

[redacted]

Long-Term Outcomes (6–8 weeks)

Long-term outcomes of medical therapy in CSOM are evaluated after 6–8 weeks. [redacted]

Outcome Measure	6–8 Week Follow-Up Goal
[redacted]	[redacted]
[redacted]	[redacted]
[redacted]	[redacted]
[redacted]	[redacted]

Indication for Surgical Referral (e.g., Tympanoplasty)

Surgical referral is considered when medical therapy fails to result in a dry ear, when hearing loss persists despite epithelial recovery, or when there is ossicular erosion or cholesteatoma. [redacted]

- Persistent perforation with or without discharge after 6–8 weeks

[redacted]

Patient-Related Factors Affecting Outcome

The outcome of medical management in chronic suppurative otitis media (CSOM) is influenced not only by the drug regimen but also by individual patient-related factors. [redacted]

These variables must be considered by ENT clinicians when planning and modifying therapy(23).

- **Age**:
- **Immunity and Comorbidities**:
- **Environmental Hygiene**:
- **Previous Recurrences**:
- **Socioeconomic Status**

In ENT clinical decision-making, personalized care is essential.

ENT Departmental Relevance and Practical Utility

Chronic suppurative otitis media (CSOM), particularly of the mucosal type, constitutes a significant workload in ENT outpatient departments (OPDs) across both urban and rural healthcare systems. The practical utility of structured, conservative therapy lies in its ability to resolve infection, restore hearing, and prevent complications, thereby reducing the need for surgical intervention(1,98).

- **High patient volume**: [redacted]

[redacted]**Pre-tympanoplasty preparation**: [redacted]

[redacted]**Clinical skill training**: [redacted]

[redacted]**Surgery prevention**: [redacted]

[redacted]**Guideline-based care**: [redacted]

[redacted]

Research Studies

[redacted] **2024** conducted a prospective comparative study evaluating the effectiveness of 2% acetic acid versus ciprofloxacin ear drops in patients with tubotympanic (mucosal) type of chronic suppurative otitis media (CSOM). [redacted]

2025 investigated the clinical outcomes and recurrence rates in patients with chronic suppurative otitis media (CSOM) treated using a combination of ofloxacin and dexamethasone.

2025 presented a clinico-microbiological profile of patients diagnosed with chronic suppurative otitis media with cholesteatoma, a more destructive form of CSOM.

[redacted]

[redacted] **2025** evaluated the efficacy and safety of ciprofloxacin in otitis externa, with extrapolations to its use in chronic otitis media, including mucosal CSOM. [redacted]

[redacted] **2025** conducted a systematic review on the global epidemiology of chronic suppurative otitis media (CSOM), offering essential background context for mucosal CSOM research. [redacted]

[redacted]

[redacted] **2024** conducted a cross-sectional study to identify biofilm-producing organisms and their antibiotic sensitivity patterns in patients with chronic suppurative otitis media (CSOM). [redacted]

[redacted] **2024** explored the pathogenesis, diagnosis, and treatment strategies of biofilm-related ENT infections, with a dedicated section on chronic suppurative otitis media (CSOM). [redacted]

[redacted]

[redacted] **2024** studied the bacteriological spectrum and antibiotic susceptibility patterns in CSOM patients attending a tertiary center in Maharashtra, India. [redacted]

[redacted] **2022** assessed the clinical effectiveness of 2% acetic acid versus ciprofloxacin ear drops in the treatment of chronic otitis media, with the study population primarily comprising mucosal-type CSOM cases. [redacted]

[redacted]

[redacted] **2022** presented a comprehensive review of ciprofloxacin resistance mechanisms, including its implications for ENT infections such as CSOM. [redacted]

[redacted] **2022** conducted a large-scale outcomes study on chronic suppurative otitis media (CSOM), focusing on its long-term health utilization and patient impact. [redacted]

[redacted]

[redacted] **2022** published a comprehensive review on the ototoxic potential of topical antibiotic ear drops, specifically focusing on chronic suppurative otitis media (CSOM). [redacted]

[redacted] **2020** conducted a Cochrane systematic review on topical antibiotic use in chronic suppurative otitis media (CSOM). [redacted]

[redacted] **2020** evaluated the efficacy and safety of novel ototopical drops containing a synthetic antibacterial peptide in adults with CSOM, including mucosal-type cases. [redacted]

[redacted] **2019** conducted a non-randomized control trial comparing the effectiveness of 2% acetic acid versus ciprofloxacin ear drops in adult patients with mucosal CSOM in Islamabad, Pakistan. [redacted]

[redacted] **2019** investigated microbiological contamination in ENT clinics, specifically on devices and treatment areas used for otologic care, including topical medication

dispensers. [redacted]

[redacted] **2015**reviewed current perspectives on pathogenesis and treatment of CSOM, focusing on the role of chronic inflammation, biofilms, and host response. [redacted]

[redacted] **2015**conducted a pivotal review of the antibiofilm properties of acetic acid, including its applications in ENT infections such as chronic suppurative otitis

media (CSOM). [redacted]

[redacted] **2014**conducted a cross-sectional comparative study on the prevalence of otitis media among children in urban slums, non-slum urban, and rural areas of Delhi. [redacted]

[redacted] **2014**carried out a comparative clinical study assessing the role of acetic acid irrigation in the medical management of CSOM, directly focusing on drying the ear in cases with active discharge. [redacted]

[redacted]

[redacted] **2014**conducted a clinical study comparing topical ciprofloxacin alone vs ciprofloxacin combined with other agents in the management of discharging CSOM. [redacted]

[redacted] **2011**conducted a bacteriological study on patients with chronic suppurative otitis media (CSOM) in Agartala, India, focusing on microbial isolates and antibiotic sensitivity patterns. [redacted]

Justification and Rationale for Present Study

Chronic suppurative otitis media (CSOM) remains a major clinical burden in otolaryngology, especially the mucosal type, which represents the "safe" yet persistent variant of the disease. Most existing literature focuses on broader CSOM management, with few randomized or observational studies specifically targeting the mucosal variant and real-world patient outcomes(100).

MATERIAL AND METHODS

MATERIAL AND METHODS

Study design: [redacted]

Place of study: [redacted]

Duration of study: [redacted]

Sample size:

[redacted]

Sampling method: [redacted]

Inclusion criteria:

[redacted]

Exclusion criteria

[redacted]

DATA COLLECTION

Ethical Approval and Informed Consent

[redacted]

Clinical History

[redacted]

[redacted]

Otological Examination

[redacted]

Vestibular Assessment

[redacted]

Examination of Nose

[redacted]

Assesment of Hearing

[redacted]

GROUP ALLOCATION

[redacted]

TREATMENT PROTOCOL

Systemic Antibiotic Therapy

Aural Toilet

Topical Therapy

FOLLOW-UP PROTOCOL

OUTCOME ASSESSMENT

[redacted]

CRITERIA FOR DISCONTINUATION OF TREATMENT

[redacted]

STATISTICAL ANALYSIS

[redacted]

[redacted]

[redacted]

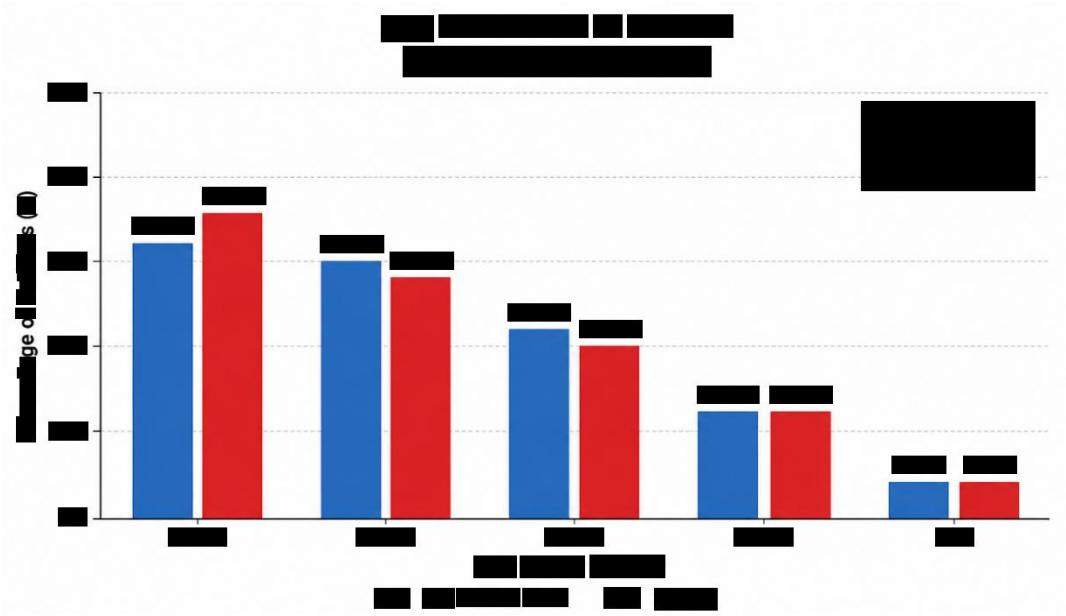
RESULTS

RESULTS

Table 1: Comparison of Age Distribution Between Patients Treated with 2% Acetic Acid Ear Drops and Ciprofloxacin (Ciplox) Ear Drops in Mucosal Type CSOM

Age group	2% Acetic Acid		Ciplox		Chi-square	df	p value
	N	%	n	%			
18–30	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
31–40	[redacted]	[redacted]	[redacted]	[redacted]			
41–50	[redacted]	[redacted]	[redacted]	[redacted]			
51–60	[redacted]	[redacted]	[redacted]	[redacted]			
>60	[redacted]	[redacted]	[redacted]	[redacted]			

Graph 1: Comparison of Age Distribution Between Patients Treated with 2% Acetic Acid Ear Drops and Ciprofloxacin (Ciplox) Ear Drops in Mucosal Type CSOM

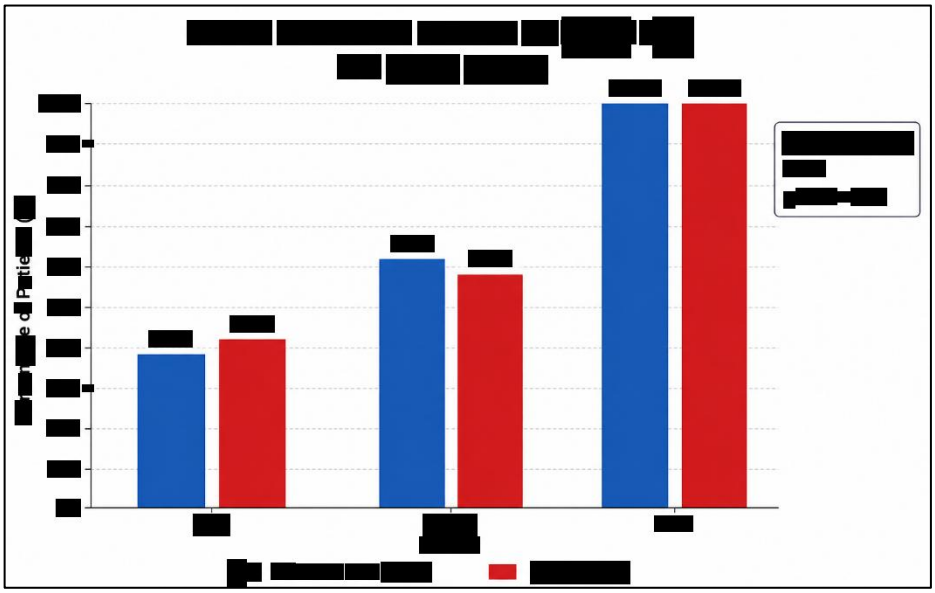


[redacted]

Table 2: Gender Distribution of Patients with Mucosal Type of Chronic Suppurative Otitis Media in the 2% Acetic Acid Drop Group and Ciplox Ear Drop Group

Gender	2% Acetic Acid		Ciplox		Chi-square	df	p value
	n	%	N	%			
Male	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Female	[redacted]	[redacted]	[redacted]	[redacted]			
Total	[redacted]	[redacted]	[redacted]	[redacted]			

Graph 2: Gender Distribution of Patients with Mucosal Type of Chronic Suppurative Otitis Media in the 2% Acetic Acid Drop Group and Ciplox Ear Drop Group

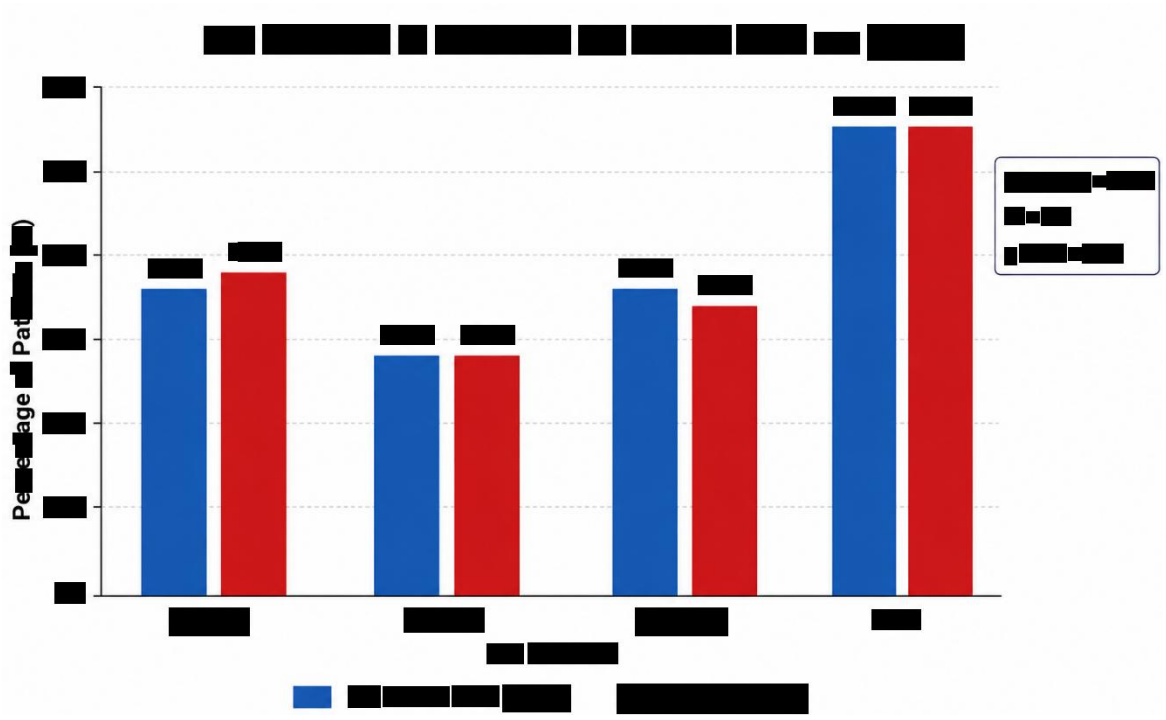


[redacted]

Table 3: Laterality of Ear Involvement in Patients with Mucosal Type of Chronic Suppurative Otitis Media in the 2% Acetic Acid Drop Group and Ciplox Ear Drop Group

Ear involved	2% Acetic Acid		Ciplox		Chi-square	df	p value
	n	%	n	%			
Bilateral	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Left ear	[redacted]	[redacted]	[redacted]	[redacted]			
Right ear	[redacted]	[redacted]	[redacted]	[redacted]			
Total	[redacted]	[redacted]	[redacted]	[redacted]			

Graph 3: Laterality of Ear Involvement in Patients with Mucosal Type of Chronic Suppurative Otitis Media in the 2% Acetic Acid Drop Group and Ciplox Ear Drop Group



[redacted]

Table 4: Duration of Ear Discharge in Patients with Mucosal Type of Chronic Suppurative Otitis Media in the 2% Acetic Acid Drop Group and Ciplox Ear Drop Group.

Duration	2% Acetic Acid		Ciplox		Chi-square	df	p value
	n	%	n	%			
1 year	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
2 Years	[redacted]	[redacted]	[redacted]	[redacted]			
3 months	[redacted]	[redacted]	[redacted]	[redacted]			
6 months	[redacted]	[redacted]	[redacted]	[redacted]			
Total	[redacted]	[redacted]	[redacted]	[redacted]			

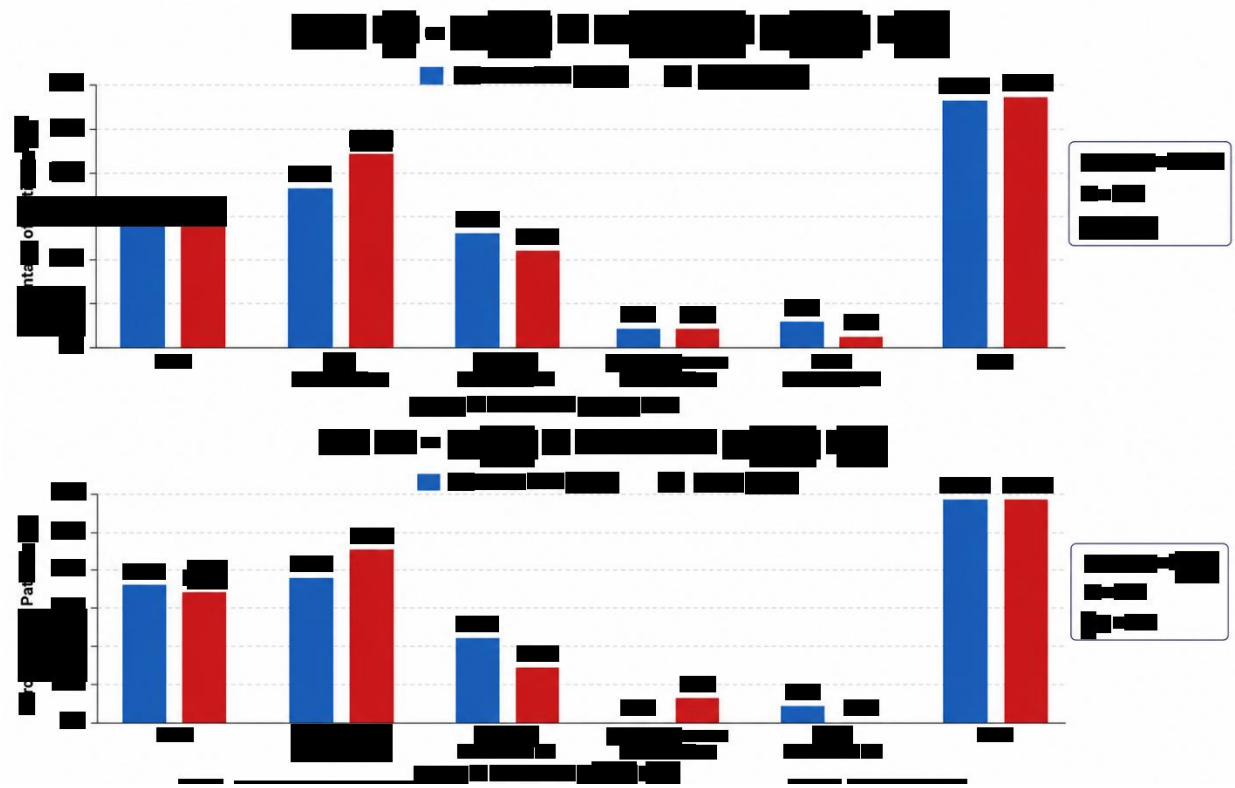
[redacted]

Table 5: Distribution of Hearing Loss (Right and Left Ear) in Patients with Mucosal Type of Chronic Suppurative Otitis Media in the 2% Acetic Acid Group and Ciprofloxacin (Ciplox) Group

Right	2% Acetic Acid		Ciplox		Chi-square	df	Sig.
	n	%	n	%			
None	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Mild Conductive HL	[redacted]	[redacted]	[redacted]	[redacted]			
Moderate Conductive HL	[redacted]	[redacted]	[redacted]	[redacted]			
Moderately severe Conductive HL	[redacted]	[redacted]	[redacted]	[redacted]			
Sever Conductive HL	[redacted]	[redacted]	[redacted]	[redacted]			
Total	[redacted]	[redacted]	[redacted]	[redacted]			

Left	2% Acetic Acid		Ciplox		Chi-square	df	Sig.
	n	%	n	%			
None	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Mild Conductive HL	[redacted]	[redacted]	[redacted]	[redacted]			
Moderate Conductive HL	[redacted]	[redacted]	[redacted]	[redacted]			
Moderately severe Conductive HL	[redacted]	[redacted]	[redacted]	[redacted]			
Sever Conductive HL	[redacted]	[redacted]	[redacted]	[redacted]			
Total	[redacted]	[redacted]	[redacted]	[redacted]			

Graph 4: Distribution of Hearing Loss (Right and Left Ear) in Patients with Mucosal Type of Chronic Suppurative Otitis Media in the 2% Acetic Acid Group and Ciprofloxacin (Ciplox) Group

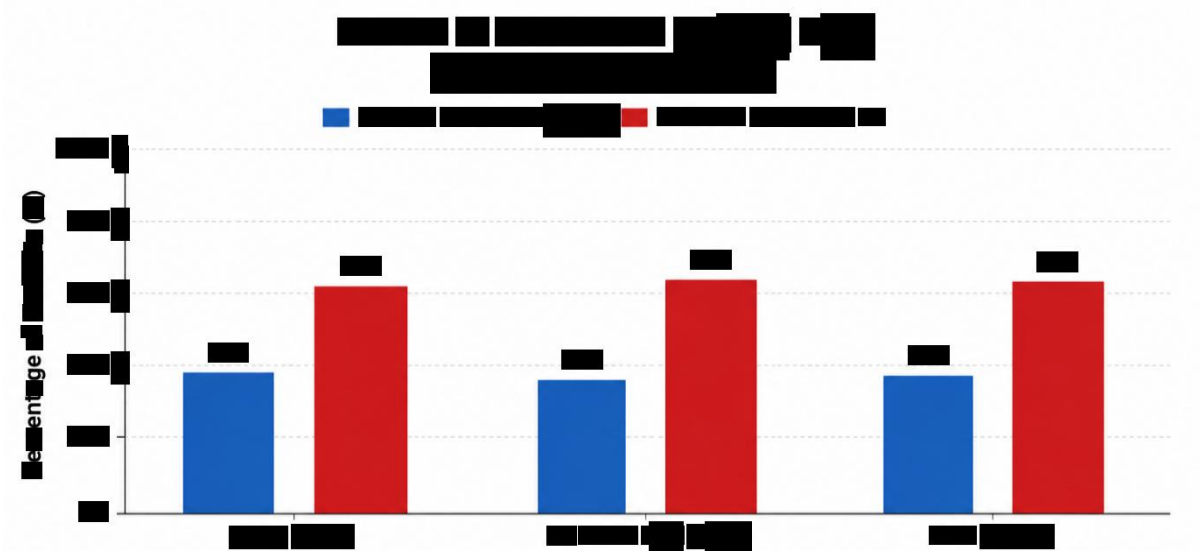


[redacted]

Table 6: Distribution of Bilateral and Unilateral Conductive Hearing Loss in Patients with Mucosal Type of Chronic Suppurative Otitis Media in the 2% Acetic Acid and Ciplox Ear Drop Groups

Group	Bilateral Conductive HL n (%)	Unilateral Conductive HL n (%)	Total
Ciplox	[redacted]	[redacted]	[redacted]
2% Acetic Acid	[redacted]	[redacted]	[redacted]
Total	[redacted]	[redacted]	[redacted]

Graph 5: Distribution of Bilateral and Unilateral Conductive Hearing Loss in Patients with Mucosal Type of Chronic Suppurative Otitis Media in the 2% Acetic Acid and Ciplox Ear Drop Groups



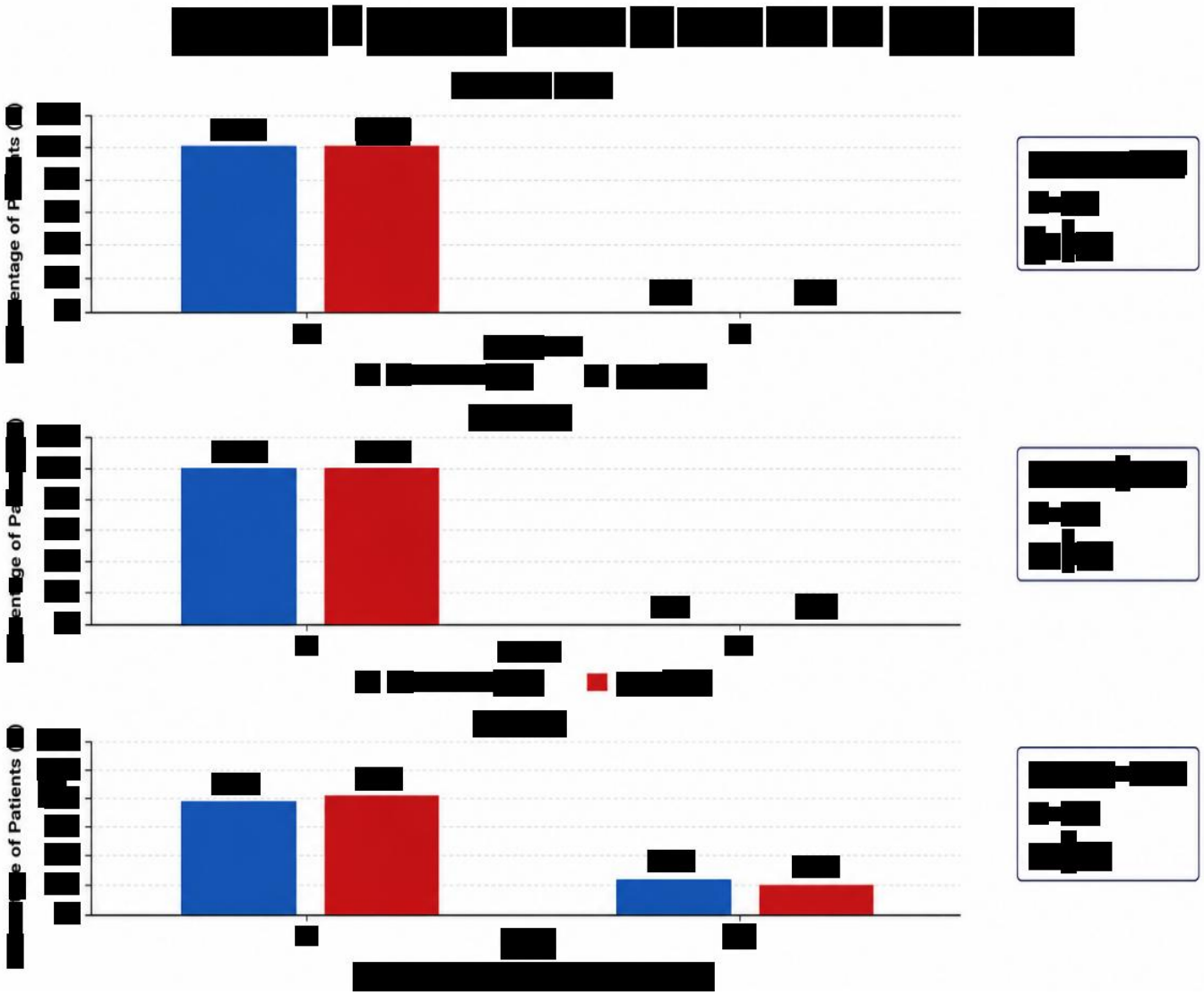
[redacted]

[redacted]

Table 7: Distribution of Presenting Symptoms in Patients with Mucosal Type of Chronic Suppurative Otitis Media in the 2% Acetic Acid Group and Ciprofloxacin (Ciplox) Group

		Group				Chi-square	df	Sig.
		2% Acetic Acid		Ciplox				
		n	%	n	%			
Hearing Loss	Yes	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
	No	[redacted]	[redacted]	[redacted]	[redacted]			
Tinnitus	No	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
	Yes	[redacted]	[redacted]	[redacted]	[redacted]			
Otalgia	No	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
	Yes	[redacted]	[redacted]	[redacted]	[redacted]			
Total		[redacted]	[redacted]	[redacted]	[redacted]			

Graph 6: Distribution of Presenting Symptoms in Patients with Mucosal Type of Chronic Suppurative Otitis Media in the 2% Acetic Acid Group and Ciprofloxacin (Ciplox) Group



[redacted]

Table 8: Type of Ear Discharge and Perforation Size in Patients with Mucosal Type of Chronic Suppurative Otitis Media in the 2% Acetic Acid Drop Group and Ciplox Ear Drop Group.

		Group				Chi-square	df	Sig.
		2% Acetic Acid		Ciplox				
		n	%	n	%			
Discharge Type	Mucoid	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
	Mucopurulent	[redacted]	[redacted]	[redacted]	[redacted]			
Total		[redacted]	[redacted]	[redacted]	[redacted]			
TM Perforation Size	Large	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
	Medium	[redacted]	[redacted]	[redacted]	[redacted]			
	Small	[redacted]	[redacted]	[redacted]	[redacted]			
Total		[redacted]	[redacted]	[redacted]	[redacted]			

Graph 7: Type of Ear Discharge and Perforation Size in Patients with Mucosal Type of Chronic Suppurative Otitis Media in the 2% Acetic Acid Drop Group and Ciplox Ear Drop Group.

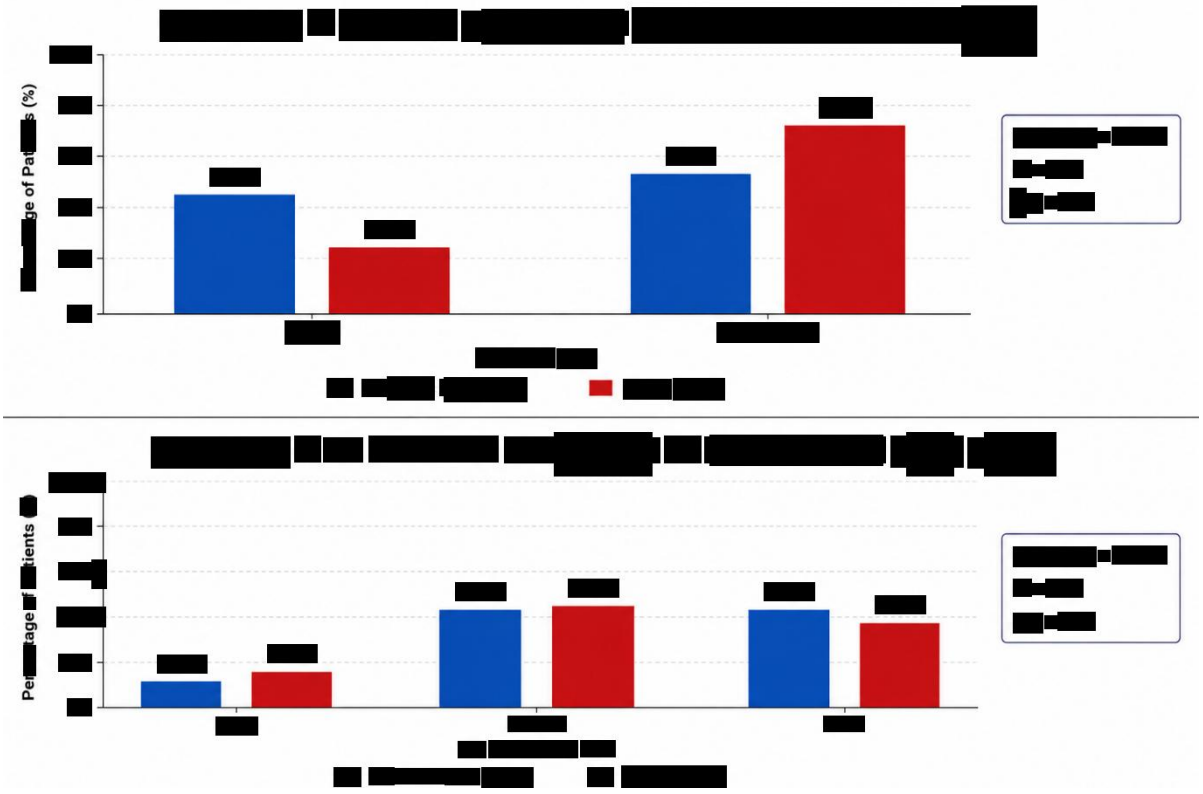
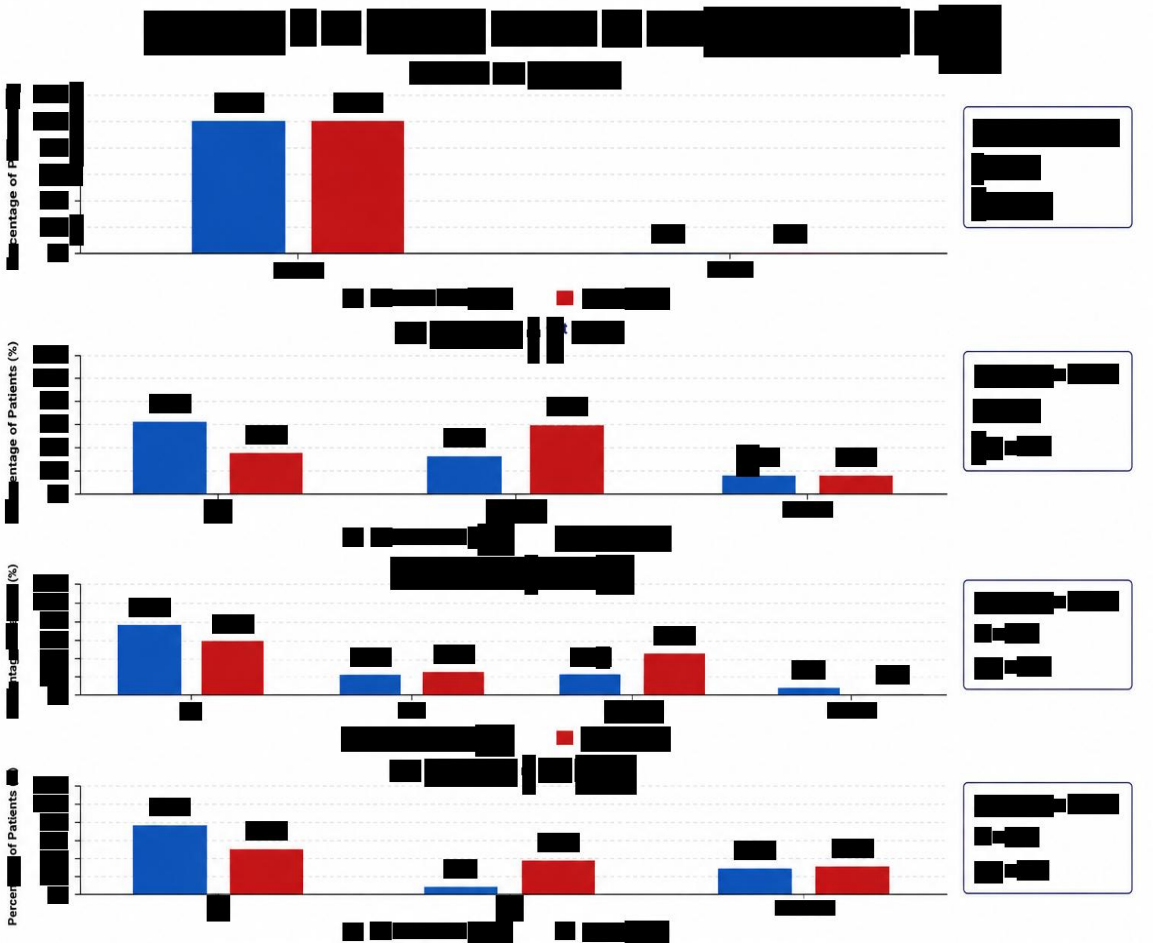


Table 9: Comparison of Ear Discharge Status at Baseline, 1 Week, 2 Weeks, and 3 Months in Patients with Mucosal Type of Chronic Suppurative Otitis Media in the 2% Acetic Acid Group and Ciprofloxacin (Ciplox) Group

Discharge		Group				Chi-square	df	Sig.
		2% Acetic Acid		Ciplox				
		n	%	n	%			
Baseline Ear Discharge	Present	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
	Absent	[redacted]	[redacted]	[redacted]	[redacted]			
Discharge 1st week	Mild	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
	Moderate	[redacted]	[redacted]	[redacted]	[redacted]			
	Profuse	[redacted]	[redacted]	[redacted]	[redacted]			
Discharge 2nd week	Dry	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
	Mild	[redacted]	[redacted]	[redacted]	[redacted]			
	Moderate	[redacted]	[redacted]	[redacted]	[redacted]			
	Profuse	[redacted]	[redacted]	[redacted]	[redacted]			
Discharge 3rd month	Dry	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
	Mild	[redacted]	[redacted]	[redacted]	[redacted]			
	Moderate	[redacted]	[redacted]	[redacted]	[redacted]			

Graph 8: Comparison of Ear Discharge Status at Baseline, 1 Week, 2 Weeks, and 3 Months in Patients with Mucosal Type of Chronic Suppurative Otitis Media in the 2% Acetic Acid Group and Ciprofloxacin (Ciplox) Group



[redacted]

Table 10: Comparison of Middle Ear Mucosal Status at 1 Week, 2 Months, and 3 Months in Patients with Mucosal Type of Chronic Suppurative Otitis Media in the 2% Acetic Acid Group and Ciprofloxacin (Ciplox) Group

Middle Ear Mucosa		Group				Chi-square	df	Sig.
		2% Acetic Acid		Ciplox				
		n	%	n	%			
Middle Ear Mucosa 1st week	Healthy	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
	Inflamed	[redacted]	[redacted]	[redacted]	[redacted]			
Middle Ear Mucosa 2nd month	Healthy	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
	Inflamed	[redacted]	[redacted]	[redacted]	[redacted]			
Middle Ear Mucosa 3rd month	Healthy	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
	Inflamed	[redacted]	[redacted]	[redacted]	[redacted]			

Graph 9: Comparison of Middle Ear Mucosal Status at 1 Week, 2 Months, and 3 Months in Patients with Mucosal Type of Chronic Suppurative Otitis Media in the 2% Acetic Acid Group and Ciprofloxacin (Ciplox) Group

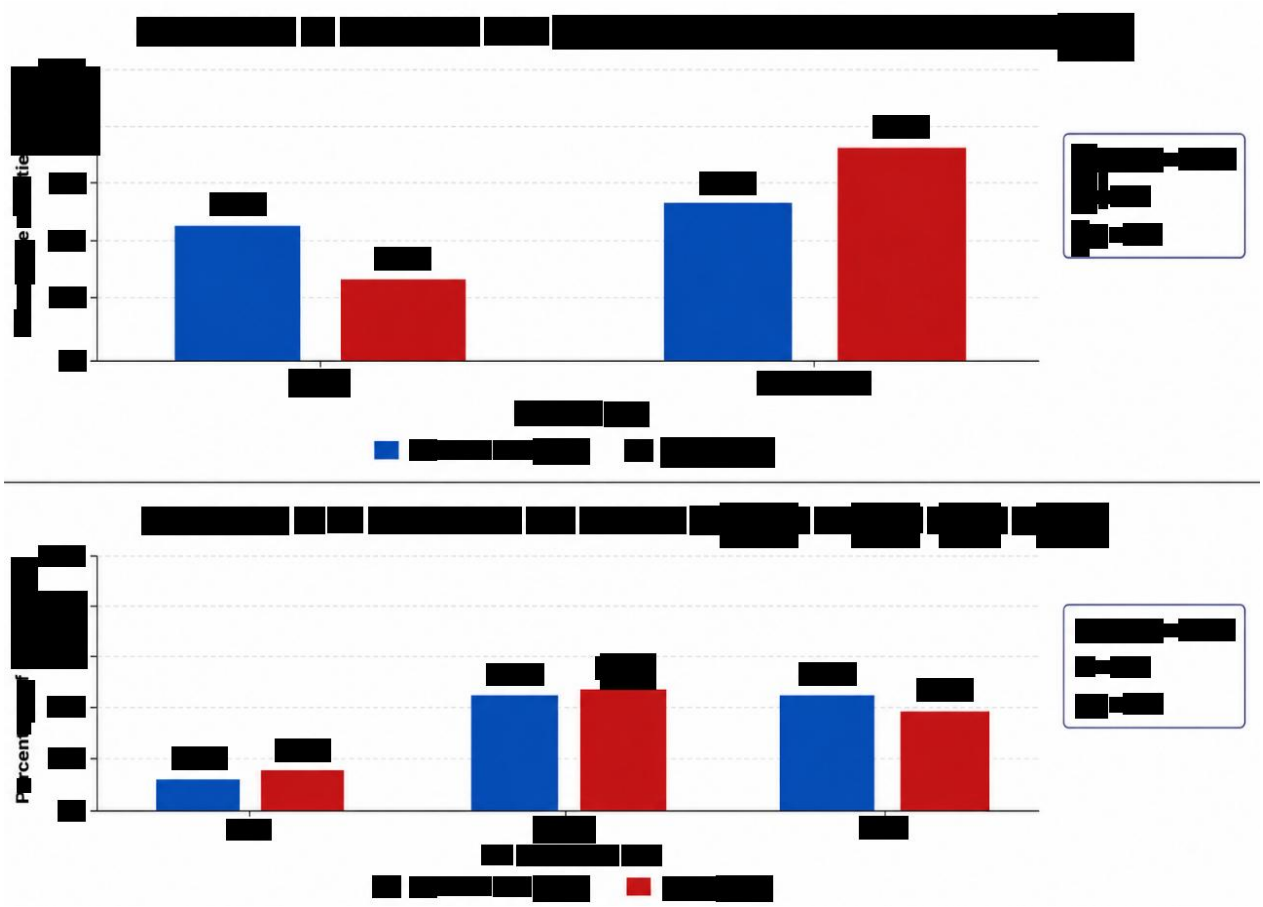


Table 11: Comparison of Tympanic Membrane Perforation Status at 1 Week, 2 Weeks, and 3 Months in Patients with Mucosal Type of Chronic Suppurative Otitis Media in the 2% Acetic Acid Group and Ciprofloxacin (Ciplox) Group

Perforation		Group				Chi-square	df	Sig.
		2% Acetic Acid		Ciplox				
		n	%	N	%			
Perforation 1st week	Same Size	[redacted]	[redacted]	[redacted]	[redacted]	-	-	-
Perforation 2nd week	Reduced Size	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
	Same Size	[redacted]	[redacted]	[redacted]	[redacted]			
Perforation 3rd month	Healed	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
	Not healed	[redacted]	[redacted]	[redacted]	[redacted]			

Graph 10: Comparison of Tympanic Membrane Perforation Status at 1 Week, 2 Weeks, and 3 Months in Patients with Mucosal Type of Chronic Suppurative Otitis Media in the 2% Acetic Acid Group and Ciprofloxacin (Ciplox) Group

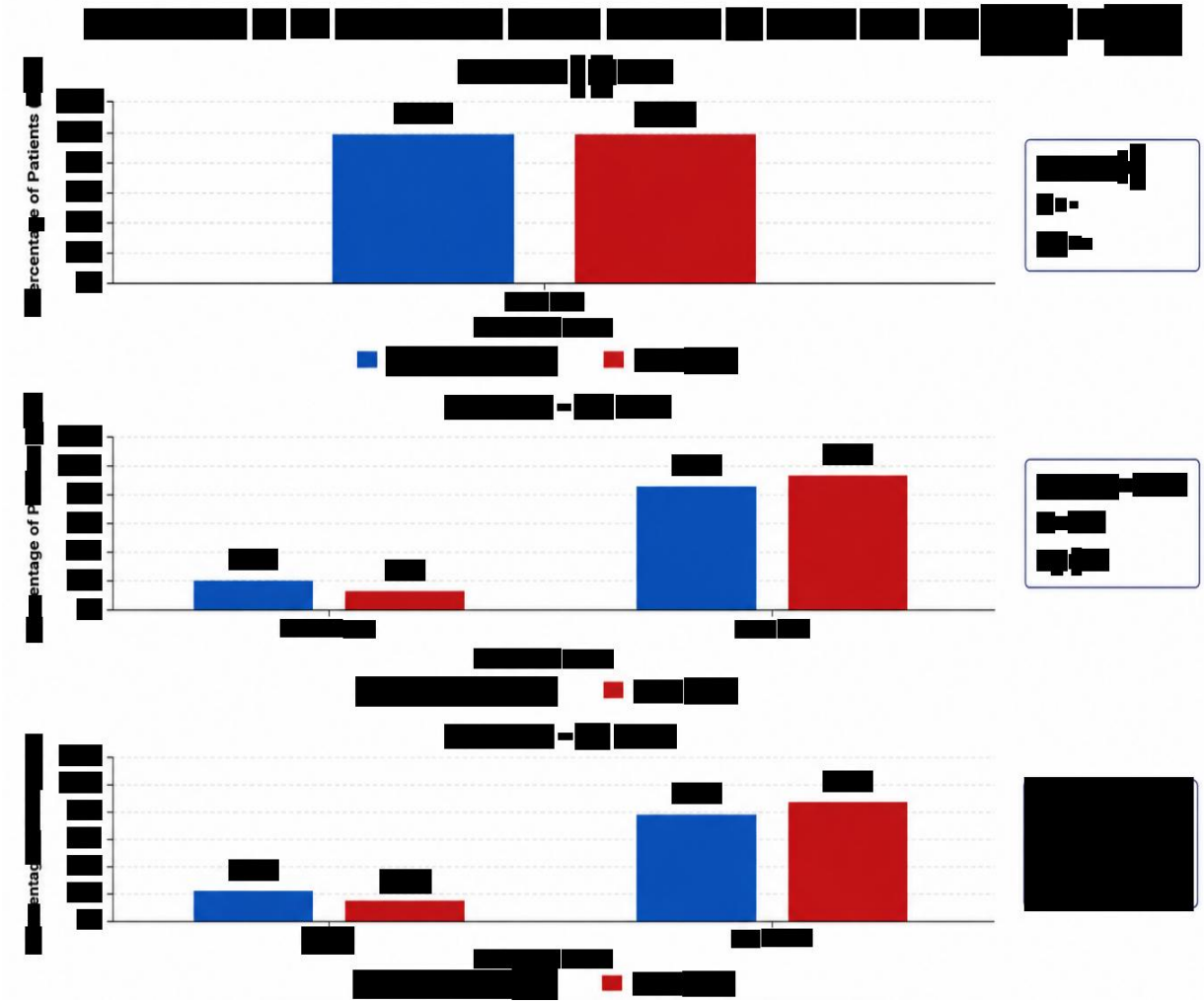


Table 12: Final Comparison of Outcomes at 3 Months in Patients with Mucosal Type of Chronic Suppurative Otitis Media in the 2% Acetic Acid Group and Ciprofloxacin (Ciplox) Group

3rd month		Group				Chi-square	df	Sig.
		2% Acetic Acid		Ciplox				
		n	%	n	%			
Discharge 3rd month	Dry	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
	Mild	[redacted]	[redacted]	[redacted]	[redacted]			
	Moderate	[redacted]	[redacted]	[redacted]	[redacted]			
Middle Ear Mucosa 3rd month	Healthy	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
	Inflamed	[redacted]	[redacted]	[redacted]	[redacted]			
Perforation 3rd month	Healed	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
	Not healed	[redacted]	[redacted]	[redacted]	[redacted]			

[redacted]

DISCUSSION

DISCUSSION

Chronic suppurative otitis media (CSOM) is a common chronic middle ear infection characterized by persistent ear discharge through a perforated tympanic membrane and is a significant cause of preventable hearing impairment. [redacted]

In the present study, the majority of patients belonged to the [redacted] years age group, accounting for [redacted] in Group A and [redacted] in Group B, followed by the [redacted] years age group ([redacted] Overall, approximately [redacted] of patients in Group A and [redacted] in Group B were below [redacted] years of age. [redacted]

[redacted]

[redacted]

In the present study, bilateral ear involvement was observed in [redacted] of patients in Group A and [redacted] in Group B, followed by right ear involvement ([redacted] and left ear involvement ([redacted] in both groups). The difference in laterality [redacted]

In the present study, the distribution of hearing loss in both right and left ears was comparable between the two groups ([redacted]). Mild conductive hearing loss was the most common finding in both groups, observed in [redacted] of patients [redacted]

al. similarly found that most patients had mild to moderate conductive hearing loss, reflecting the typical clinical presentation of mucosal CSOM.

The difference in perforation size distribution between the two groups was not statistically significant ( ), suggesting comparable baseline severity.

Similarly,

These findings indicate superior efficacy of acetic acid ear drops in achieving resolution of ear discharge over time.

acid group had healthy mucosa compared to [redacted] in the ciprofloxacin group ([redacted] These findings indicate that [redacted] acetic acid ear drops were more effective in promoting mucosal recovery over time. [redacted] (13) reported better mucosal healing in patients treated

Thus, the present study indicates that [redacted] acetic acid ear drops are more effective than ciprofloxacin ear drops in promoting tympanic membrane perforation healing in patients with mucosal type chronic suppurative otitis media.

Thus, the present study strongly supports that acetic acid ear drops are more effective than ciprofloxacin ear drops in achieving better overall clinical outcomes in mucosal type chronic suppurative otitis media, particularly in terms of discharge resolution, mucosal recovery, and tympanic membrane healing, while both treatments show comparable hearing improvement.

Strengths & Limitations of the Study

Strengths of the Study

- **Prospective study design –** [redacted]
- **Direct comparison of two commonly used topical therapies –** [redacted]
- **Well-defined study objectives –** [redacted]
- **Comparable baseline characteristics –** [redacted]
- **Adequate follow-up period –** [redacted]
- **Simple and cost-effective intervention –** [redacted]
- **Objective statistical analysis –** [redacted]
- **Evaluation of safety profile –** [redacted]

Limitations of the Study

- **Single-center study –** [redacted]
- **Relatively small sample size –** [redacted]
- **Non-randomized observational design –** [redacted]
- **Lack of microbiological evaluation –** [redacted]
- **Short follow-up duration for some outcomes –** [redacted]
- **Hearing outcome assessment was limited –** [redacted]
- **Blinding was not performed –** [redacted]
- **Other confounding factors not evaluated –** [redacted]

CONCLUSION

CONCLUSION

The present prospective observational study evaluated the effectiveness of [redacted] acetic acid ear drops compared with ciprofloxacin ear drops in the management of mucosal type active chronic suppurative otitis media (CSOM). [redacted]

Considering its low cost, easy availability, and favorable safety profile, acetic acid ear drops may be considered an effective first-line topical treatment option in the medical management of active mucosal CSOM.

SUMMARY

SUMMARY

1. Chronic suppurative otitis media (CSOM) is a common chronic middle ear infection characterized by persistent ear discharge through a perforated tympanic membrane.

[redacted]

[redacted]

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ANNEXURES

ANNEXURE I

List of Abbreviations

Abbreviation	Full Form
CSOM-	Chronic Suppurative Otitis Media
TM	Tympanic Membrane
χ^2	Chi-Square Test
SD	Standard Deviation
ENT	Ear, Nose and Throat
P. aeruginosa	Pseudomonas aeruginosa
%	Percentage
N	Number of Subjects
P	Probability Value
Group A	Patients treated with 2% Acetic Acid Ear Drops
Group B	Patients treated with Ciprofloxacin Ear Drops

ANNEXURE II

CASE RECORD FORM

Title of Synopsis: [redacted]

Case no: **Date:**

Age:

Sex:

Address:

[redacted]

Local examination of ear

	[redacted]	[redacted]
[redacted]		
[redacted]		
[redacted]		
[redacted]		
[redacted]		
[redacted]		

Examination under Microscope(EUM)

[redacted]	[redacted]	[redacted]

Hearing Tests

[redacted]	[redacted]	[redacted]
[redacted]		
[redacted]		
[redacted]		

Examination of the Nose

Investigations

FACILITIES AVAILABLE IN THE INSTITUTE FOR THE STUDY:

[redacted]

ANY RISK FACTOR TO PATIENT & INVESTIGATOR:

[redacted]

ANNEXURE III

INFORMED CONSENT FORM

Title of Research Study - [redacted]

Principal Investigator's Name:

Participant's Sr No : **Name of Institution :**

Date of Birth : **Date :**

Gender :

Address :

I undersigned/with thumb impression Mr/Mrs..... [redacted]

Signature/Thumb impression **Date :**

I have witnessed accurate reading of the consent form in vernacular language to the study participant, and the individual has had the opportunity to ask questions. I confirm that the individual has given consent voluntarily.

Name of Witness : Signature of Witness : Date : [redacted]

Principal investigator's signature: **Date :**

सहभागीचेसंमतीपत्र

संशोधनात्मकअभ्यासाचेशीर्षक:-**:"**[redacted]**"**

मुख्यसंशोधकाचेनाव-:

सहभागीचेअ. क्र :- संस्थेचे नाव :-

लिंग :- दिनांक :-

जन्मदिनांक :-

[redacted]

माझ्याआजार, जखमांचे छायाचित्र , त्याच्या/तिच्यावरकरण्यातआलेलेउपचारवत्याच्या/तिच्यावैद्यकीयचाचण्यांचेनिष्कर्षइ . चीमाहितीसंशोधनासाठीवप्रकाशितकरण्यासाठीवापरण्यासमीस्वेच्छेनेसंमतीदेतआहे . असेकरतानामाझीओळखगोपनीयराहीलअसेमीगृहीतधरतो/धरते.

वरीलफॉर्ममलामाझ्याबोलीभाषेतवाचूनदाखविण्यातआलावस्पष्टकरण्यातआला , त्याचाअर्थसमजूनघेऊनचमीखालीसही/अंगठाकरीतआहे.

साक्षीदाराचीसही : साक्षीदाराचेनाव :

दिनांक :

[redacted]

सशोधकाचीसही : दिनांक :

रुग्नासाठीचे माहितीपत्रक

अभ्यासाचे शीर्षक [redacted]

[redacted]

ANNEXURE IV

PATIENT INFORMATION SHEET

Title of the study: "[redacted]

Institution:. Tertiary care hospital

[redacted]

Signature of principle investigator

ANNEXURE V

MASTER CHART

Sr. No.	Patient ID	[redacted]	Age	Gender	Ear Involvement	Duration Symptoms	Baseline Ear Discharge	PTA		Hearing Loss	Tinnitus	Otalgia	Discharge Type	TM Perforation Size	Discharge			Middle Ear Mucosa			Tympanic Membrane Perforation			Adverse Effect
								Right	Left						1st Week	2nd Week	3 Months	1st Week	2nd Week	3 Months	1st Week	2nd Week	3 Months	
[redacted]	[redacted]	[redacted]	51	Female	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
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