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A PROSPECTIVE OBSERVATIONAL STUDY ON CAUSATIVE FACTORS, MANAGEMENT AND PREVENTIVE STRATEGIES OF ACUTE SUPPURATIVE OTITIS MEDIA IN A TERTIARY CARE TEACHING HOSPITAL

Dr. Pidugu Jyothi*, P. Likitha, A. S. Madhu, S. Divya, U. Manisha

Sri Lakshmi Venkateswara Institute of Pharmaceutical Sciences, Kothapeta, Proddatur, Kadapa, A.P. Department of Pharmacy practice.

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***Corresponding Author: Dr. Pidugu Jyothi**
Sri Lakshmi Venkateswara Institute of Pharmaceutical Sciences, Kothapeta, Proddatur, Kadapa, A.P. Department of Pharmacy practice.
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ABSTRACT

Acute Suppurative Otitis Media is a common infection of the middle ear, especially in children, associated with significant morbidity. This study aimed to evaluate the causative factors, management approaches, and preventive strategies of Acute Suppurative Otitis Media in a tertiary care teaching hospital. A prospective observational study was conducted over six months in a district hospital, Proddatur. Data were collected using a structured proforma from 120 patients diagnosed with Acute Suppurative Otitis Media. The most common causative factor identified was Eustachian tube dysfunction (48.3%), followed by recurrent infections, poor hygiene, improper feeding practices, and passive smoking. Medical management primarily included antibiotics, analgesics, and supportive therapy, which resulted in significant clinical improvement. Preventive strategies such as maintaining hygiene, avoiding passive smoking, and correct feeding practices were emphasized. The study concludes that early diagnosis, appropriate management, and awareness of preventive measures are crucial in reducing complications and recurrence of Acute Suppurative Otitis Media.

KEYWORDS: Acute Suppurative Otitis Media, Eustachian Tube Dysfunction, Ear Infection, Risk Factors, Management.

INTRODUCTION

Acute Suppurative Otitis Media (ASOM) is one of the most prevalent infectious conditions affecting the middle ear, particularly among infants and young children. It is characterized by acute inflammation of the mucoperiosteal lining of

the middle ear cleft, accompanied by the formation of purulent discharge. The condition remains a significant public health concern due to its high incidence, recurrent nature, and potential to cause serious complications if left untreated.

The pathophysiology of ASOM primarily involves dysfunction of the Eustachian tube, which plays a crucial role in maintaining middle ear ventilation and pressure equilibrium. In children, the Eustachian tube is anatomically shorter, wider, and more horizontally positioned compared to adults, making it more susceptible to obstruction and facilitating the entry of pathogens from the nasopharynx into the middle ear. This dysfunction results in negative pressure, fluid accumulation, and subsequent microbial colonization.

The etiology of ASOM is multifactorial, involving bacterial, viral, host-related, and environmental factors. Common bacterial pathogens include Streptococcus pneumoniae, Haemophilus influenzae, and Moraxella catarrhalis, while viral infections such as respiratory syncytial virus and rhinovirus often act as predisposing factors. Host-related factors such as immature immunity, malnutrition, and craniofacial abnormalities further increase susceptibility.

Environmental and socio-economic factors also play a significant role in the development of ASOM. Poor hygiene, overcrowded living conditions, exposure to passive smoking, air pollution, and improper infant feeding practices (especially bottle feeding in a supine position) contribute to increased disease incidence. Additionally, lack of immunization against common pathogens further elevates the risk.

Clinically, ASOM presents with symptoms such as ear pain, fever, hearing impairment, irritability in children, and ear discharge in advanced stages. If not managed appropriately, it may lead to complications such as tympanic membrane perforation, mastoiditis, hearing loss, and intracranial infections.

Management of ASOM primarily involves antimicrobial therapy, analgesics, and supportive care. Early diagnosis and timely treatment are essential to prevent complications and recurrence. Preventive strategies, including proper hygiene, breastfeeding, vaccination, and avoidance of risk factors, are crucial in reducing disease burden.

In this context, the present study was undertaken to evaluate the causative factors, management practices, and preventive strategies associated with ASOM in patients attending a tertiary care teaching hospital. The findings of this study aim to contribute to improved clinical outcomes and better preventive healthcare practices.

MATERIALS AND METHODS

This study was designed as a prospective observational study conducted over a period of six months during the year 2025–2026 at a District Government Hospital, Proddatur, Andhra Pradesh. The study aimed to evaluate the causative factors, management, and preventive strategies associated with Acute Suppurative Otitis Media.

Study Design

A prospective observational study was chosen to systematically collect and analyze real-time clinical data from patients diagnosed with ASOM without any intervention from the investigators.

Study Population

A total of 120 patients diagnosed with Acute Suppurative Otitis Media were included in the study. Patients of all age groups and both genders attending the outpatient and inpatient departments were considered.

Inclusion Criteria

- ✓ Patients diagnosed clinically with Acute Suppurative Otitis Media
- ✓ Patients willing to participate in the study
- ✓ Patients of all age groups

Exclusion Criteria

- ✓ Patients with Chronic Suppurative Otitis Media
- ✓ Patients with severe systemic illness
- ✓ Patients who were unwilling to provide consent

Data collected were analyzed using descriptive statistical methods. Results were expressed in terms of frequencies and percentages. Tables and graphical representations were used to enhance clarity and interpretation of results.

RESULTS

Table no. 1: age.

S.NO.	AGE	NO. OF PATIENTS	PERCENTAGE
1.	6 mon-12 yrs	62	51.6%
2.	13 yrs-25 yrs	11	9.3%
3.	26 yrs -50 yrs	18	15%
4.	51 yrs-70 yrs	29	24.1%
	TOTAL	120	100%

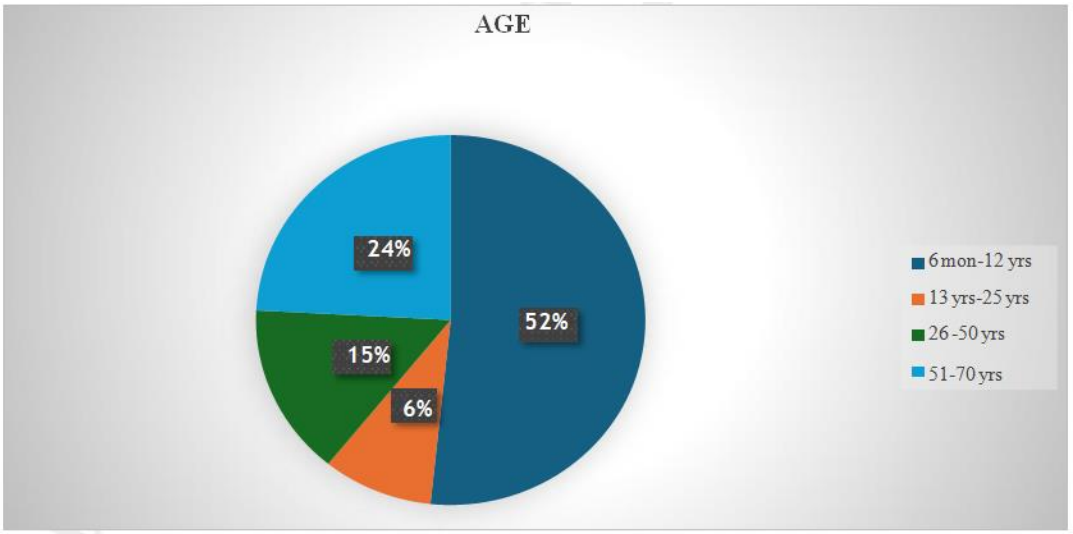

Fig. 1: Pie Diagram Representing Age-wise Distribution.

A total of 120 patients, were included in the study. Among them, 62 patients (51.6%) belonged to the 6 months-12 years age group, 11 patients (9.3%) were in the 13-25 years age group, 18 patients (50%) were in the 26-50 years age group, and 29 patients (24.1%) were in the 51-70 years age group. Mean age of patients was 25.16 ± 20.3 years.

Table no. 2: Gender.

S.NO	GENDER	NO. OF PATIENTS	PERCENTAGE
1.	MALES	70	58.4%
2.	FEMALES	50	41.6%
	TOTAL	120	100%

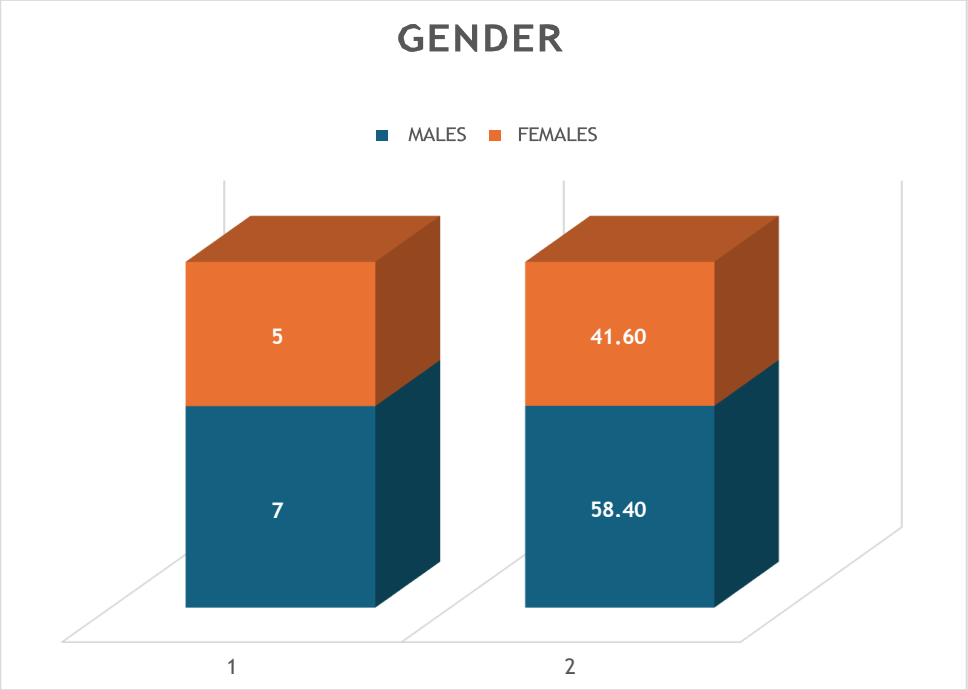

Fig. 2: Graphical Representation of Gender-wise Distribution.

A total of 120 patients were included in the study. Among them, 70 patients (58.4%) were males and 50 patients (41.6%) were females. This indicates that the condition under study was more commonly observed among males in the selected sample. Mean value for gender distribution was found to be 0.583 ± 0.493.

Table No. 3: Residence.

S.NO.	RESIDENCE	NO. OF PATIENTS	PERCENTAGE
1.	URBAN	34	28.4%
2.	RURAL	86	71.6%
	TOTAL	120	100%

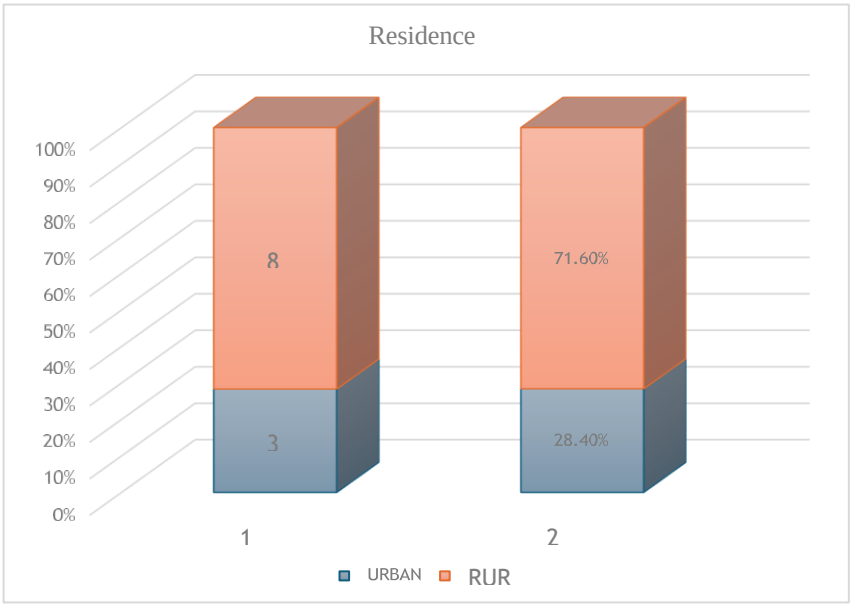

Fig. 3: Graphical Representation of Residence-wise distribution.

A Total of 120 patient were in included in the study. Among them, 34 patients (28.4%) belonged to urban areas, while 86 patients (71.6%) were from rural areas. The results indicate that the majority of the study participants were from rural areas compared to urban areas.

Mean value for residence distribution was found to be 0.283 ± 0.451.

Table no. 4: Causative factors.

S.NO.	CAUSATIVE FACTORS	NO. OF PATIENTS	PERCENTAGE
1.	EUSTACHIAN TUBE DYSFUNCTION	58	48.3%
2.	RECURRENT EAR INFECTION	24	20%
3.	WRONG FEEDING POSITIONS	10	8.3%
4.	PASSIVE SMOKING	07	5.8%
5.	POOR HYGIENE	21	17.6%
	TOTAL	120	100%

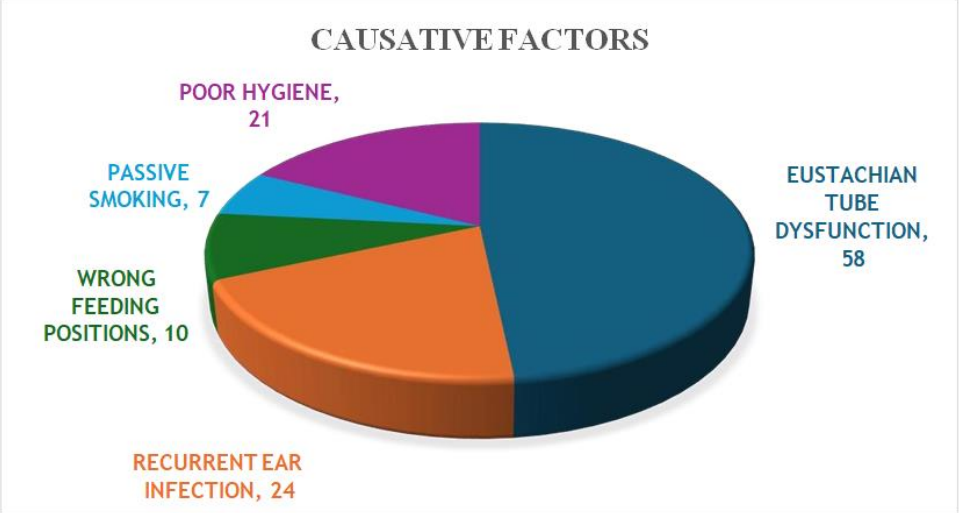

Fig. 4: Pie Diagram Showing Causative Factors.

A total of 120 patients were evaluated for the causative factors associated with Acute Suppurative Otitis Media (ASOM). Among them, Eustachian tube dysfunction was the most common causative factor, observed in 58 patients (48.3%). Recurrent ear infection was reported in 24 patients (20%). Poor hygiene was identified in 21 patients (17.6%) as a contributing factor. Wrong feeding positions were noted in 10 patients (8.3%), while passive smoking was observed in 7 patients (5.8%). Mean value for causative factors was found to be 24 ± 18.17.

Table No. 5: Symptoms.

S.NO	SYMPTOMS	NO. OF PATIENTS	PERCENTAGE
1.	EAR PAIN	38	31.6%
2.	FEVER	25	20.8%
3.	HEARING LOSS	23	19.1%
4.	IRRITABILITY	20	16.7%
5.	EAR FULLNESS	14	11.8%
	TOTAL	120	100%

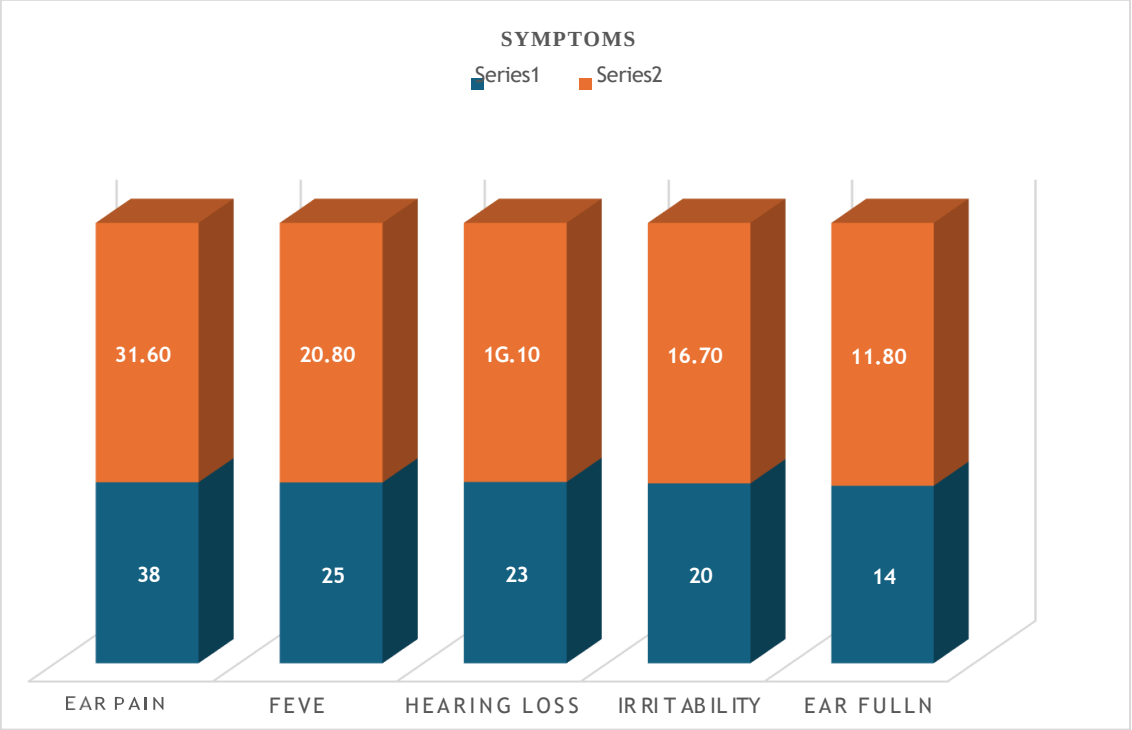

Fig. 5: Graphical Representation of Symptoms.

A total of 120 patients were evaluated for the clinical symptoms associated with Acute Suppurative Otitis Media (ASOM). Among them, ear pain was the most common symptom, reported by 38 patients (31.6%). Fever was observed in 25 patients (20.8%), while hearing loss was present in 23 patients (19.1%). Irritability was noted in 20 patients (16.7%), and ear fullness was reported by 14 patients (11.8%). Mean value for symptoms was found to be 24 ± 7.93.

Table No. 6: Duration of Symptoms.

S.NO.	DURATION OF SYMPTOMS	NO. OF PATIENTS	PERCENTAGE
1.	<3 DAYS	26	21.6%
2.	3-7 DAYS	74	61.6%
3.	>7 DAYS	20	16.8%
	TOTAL	120	100%

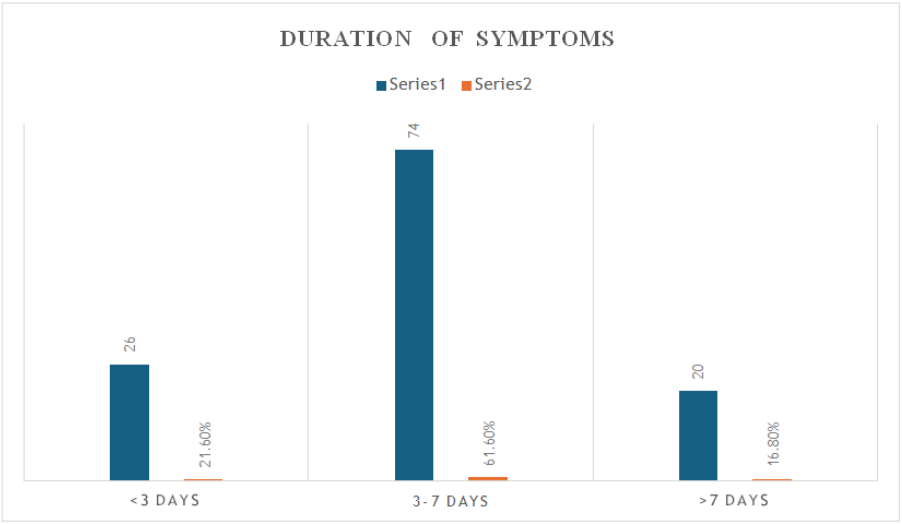

Fig: 6 Graphical Representation of Duration of symptoms

A total of 120 patients were evaluated based on the duration of symptoms associated with Acute Suppurative Otitis Media (ASOM). The majority of patients, 74 (61.6%), presented with symptoms lasting 3–7 days. 26 patients (21.6%) reported symptoms for less than 3 days, while 20 patients (16.8%) had symptoms persisting for more than 7 days.

These findings indicate that most patients sought medical attention within 3–7 days of the onset of symptoms. Mean value for duration of symptoms was found to be 4.91 ± 2.58 days.

Table No.7: Tympanic Membrane Status.

S.NO.	TYMPANIC MEMBRANE STATUS	NO. OF PATIENTS	PERCENATGE
1.	CONGESTED	25	20.8%
2.	PERFORATED	18	15%
3.	BULGING	27	22.5%
4.	HYPEREMIC	50	41.7%
	TOTAL	120	100%

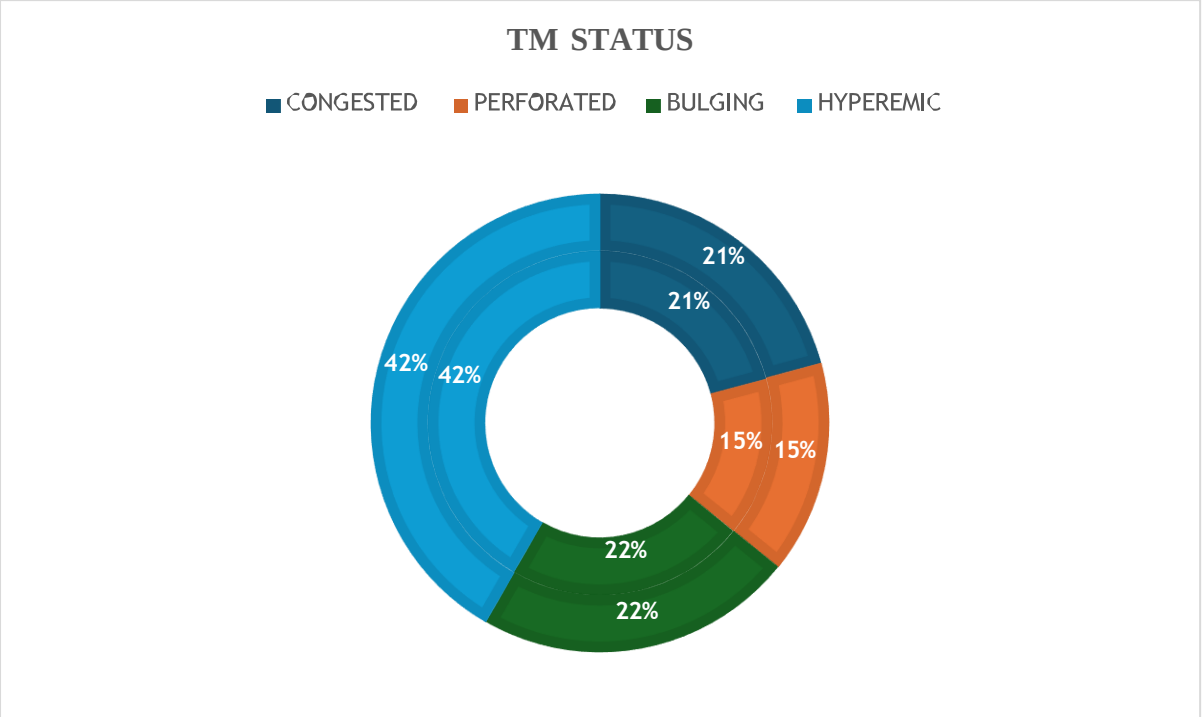

Fig. 7: Pie Diagram Showing Tympanic Membrane Status.

A total of 120 patients were examined for the status of the tympanic membrane in Acute Suppurative Otitis Media (ASOM). Among them, Hyperemic tympanic membrane was the most commonly observed finding, present in 50 patients (41.7%). Bulging of the tympanic membrane was noted in 27 patients (22.5%), while congestion was observed in 25 patients (20.8%). Perforation of the tympanic membrane was seen in 18 patients (15%). Mean value for tympanic membrane status was found to be 30 ± 12.02.

Table No. 8: Type Of Asom.

S.NO.	TYPE OF ASOM	NO. OF PATIENTS	PERCENTAGE
1.	HYPEREMIA	10	8.3%
2.	PRE- SUPPARATIVE	9	7.5%
3.	SUPPARATIVE	55	45.9%
4.	EXUDATION	22	18.3%
5.	RESOLUTION	24	20%
	TOTAL	120	100%

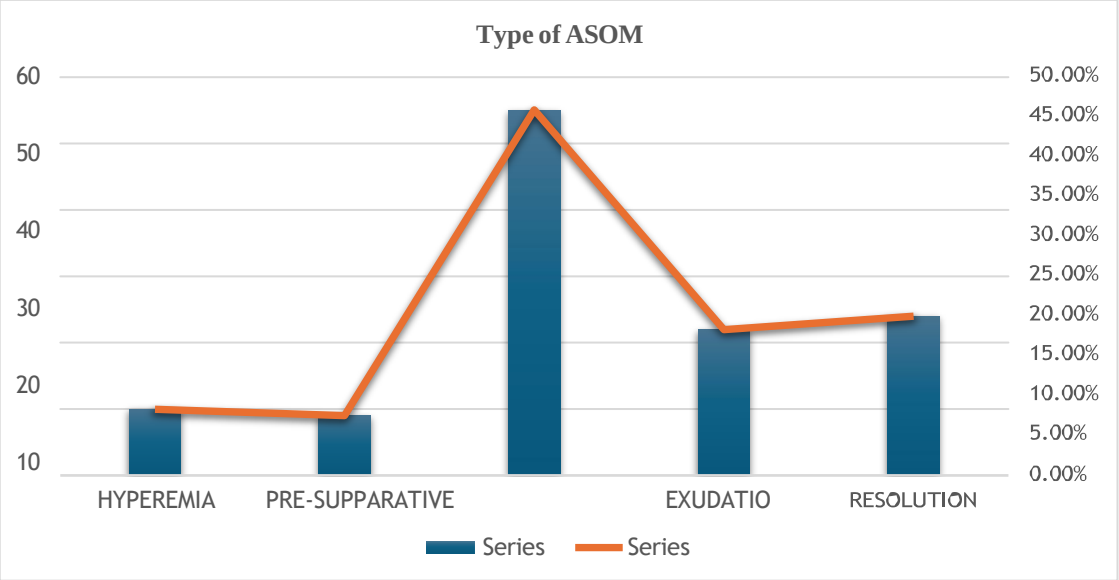

Fig. 8: Graphical Representation of Types of ASOM.

A total of 120 patients were evaluated for the type/stage of Acute Suppurative Otitis Media (ASOM). Among them, the suppurative stage was the most commonly observed, present in 55 patients (45.9%). The resolution stage was seen in 24 patients (20%), followed by the exudation stage in 22 patients (18.3%). The hyperemia stage was observed in 10 patients (8.3%), while the pre-suppurative stage was noted in 9 patients (7.5%). Mean value for type of ASOM was found to be 24 ± 16.65.

1. Degree of Hearing

Table No. 9: Degree of Hearing.

S.NO.	HEARING	NO. OF PATIENTS	PERCENTAGE
1.	MILD	75	62.5%
2.	MODERATE	45	37.5%
	TOTAL	120	100%

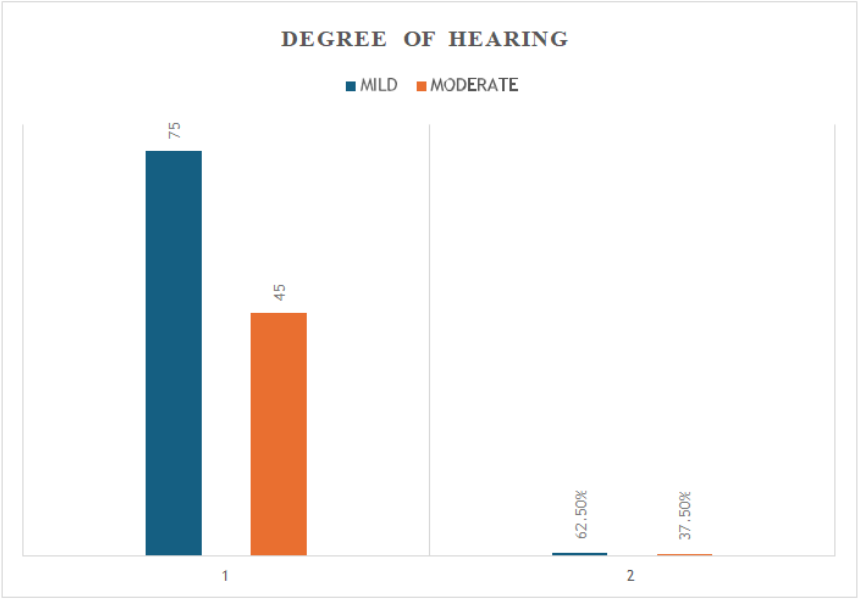

Fig. 9: Graphical Representation of Degree of hearing.

A total of 120 patients were assessed for the degree of hearing loss associated with Acute Suppurative Otitis Media (ASOM). Among them, 75 patients (62.5%) had mild hearing loss, while 45 patients (37.5%) had moderate hearing loss. The findings indicate that mild hearing loss was more common than moderate hearing loss among the study participants. Mean value for degree of hearing was found to be 1.375 ± 0.486.

Table No. 10: Management.

S.NO.	MANAGEMENT	NO. OF PATIENTS	PERCENTAGE
1.	AMOXICILLIN	15	12.5%
2.	AMOXICLAV	58	48.3%
3.	CEPHALOSPORINS	41	34.1%
4.	OTHERS	06	5.1%
	TOTAL	120	100%

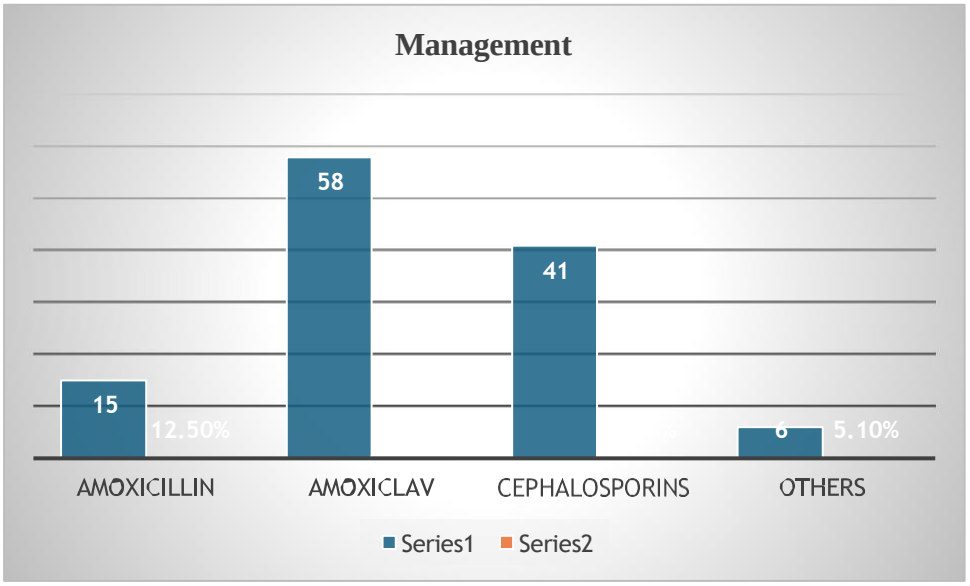

Fig. 10: Graphical Representation of Management.

Out of the 120 patients included in the study, Amoxiclav was the most commonly prescribed antibiotic, given to 58 patients (48.3%). Cephalosporins were administered to 41 patients (34.1%), making them the second most commonly used antibiotics. Amoxicillin alone was prescribed to 15 patients (12.5%). A small proportion of patients, 6 (5.1%), received other antibiotics.

These findings indicate that Amoxiclav and cephalosporins were the main antibiotics used in the management of Acute Suppurative Otitis Media (ASOM) among the study population.

Mean value for management was found to be 30 ± 23.85.

Table No. 11: Duration of Antibiotic Theraphy.

S.NO.	DURATIONOF ANITIOBIC THERAPHY	NO. OF PATIENTS	PERCENTAGE
1.	5 DAYS	21	17.5%
2.	7 DAYS	66	55%
3.	10 DAYS	33	27.5%
	TOTAL	120	100%

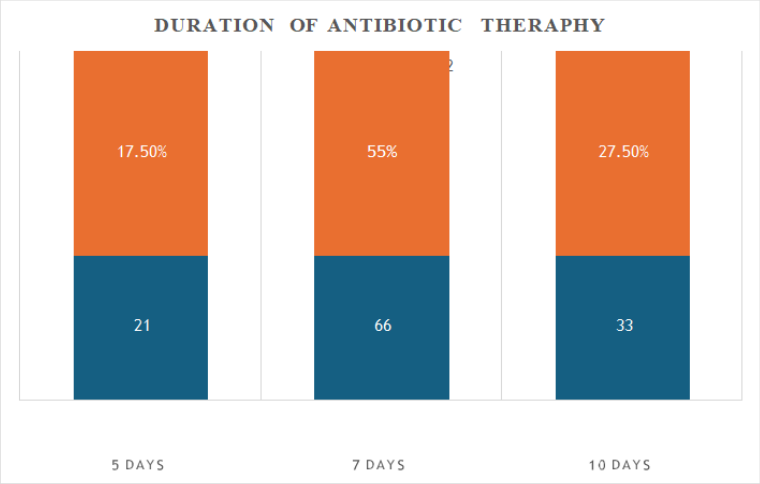

Fig. 11: Graphical Representation of Duration Of Antibiotic Therapy.

A total of 120 patients receiving antibiotic therapy were included in the study. Among them, the majority of patients 66 patients (55%) received antibiotics for 7 days, 33 patients (27%) received antibiotics for 10 days, while 21 patients (17.5%) were treated for 5 days. Mean value for duration of antibiotic therapy was found to be 7.475 ± 1.714 days.

Table No. 12: Other Medications.

S.NO.	OTHER MEDICATIONS	NO. OF PATIENTS	PERCENTAGE
1.	ANTI-PYRETICS	42	35%
2.	ANTI-HISTAMINES	34	28.3%
3.	EAR DROPS	20	16.6%
4.	NASAL DECONGESTANTS+NASAL DROPS	24	19.6%
	TOTAL	120	100%

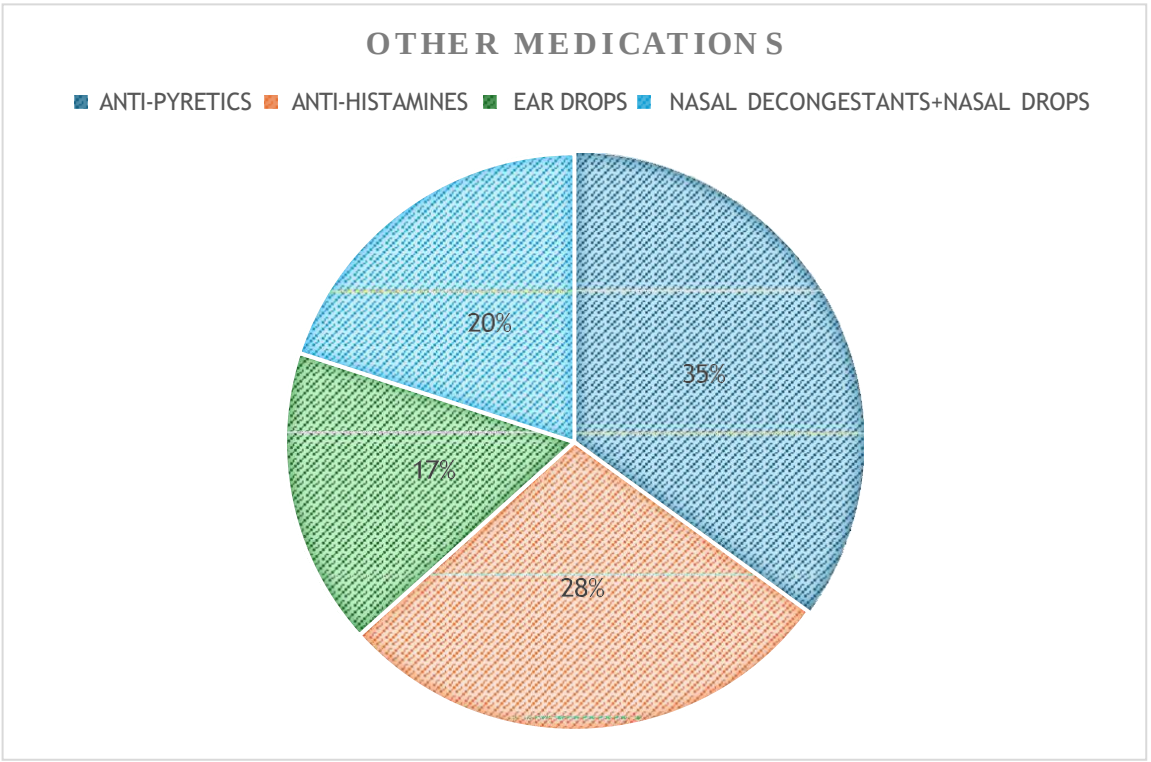

Fig. 12: Pie Diagram Showing Other medications.

A total of 120 patients were included in the study. Among the other medications prescribed for the management of ASOM, anti-pyretics were the most commonly used drugs, given to 42 patients (35%). Anti-histamines were prescribed to 34 patients (28.3%). Ear drops were administered to 20 patients (16.6%). In addition, nasal decongestants were used in 14 patients (11.6%), while nasal drops were given to 10 patients (8.3%). Mean value for other medications was found to be 30 ± 8.60.

Table No. 13: Treatment Outcome.

S.NO.	TREATMENT OUTCOME	NO. OF PATIENTS	PERCENTAGE
1.	IMPROVED	86	76%
2.	NOT IMPROVED	6	5%
3.	WORSENED	28	19%
	TOTAL	120	100%

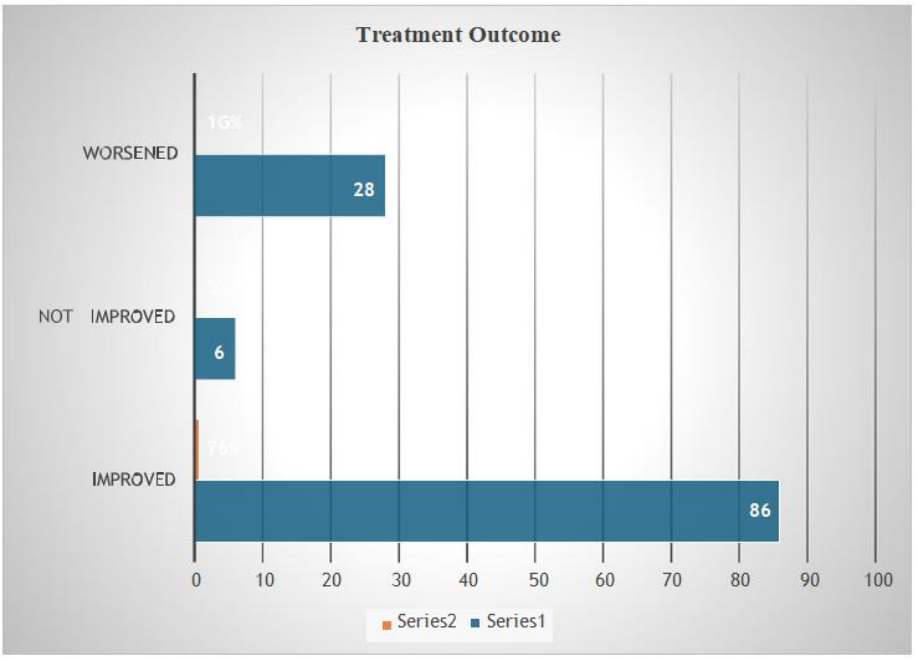

Fig. 13: Graphical Representation of Treatment outcome.

Out of the total 120 participants, 86 patients (76%) showed improvement after receiving the treatment. This indicates that the majority of the patients responded positively to the therapy, 6 patients (5%) did not show any improvement, the antibiotics were changed to alternative medications (antibiotics), suggesting that the treatment had no significant effect on a small proportion of the study population, 28 patients (19%) experienced worsening of their condition during the treatment period. This may lead to disease progression. Mean value for treatment outcomes was found to be 1.517 ± 0.846.

Table No. 14: Complications Observed.

S.NO.	COMPLICATIONS OBSERVED	NO. OF PATIENTS	PERCENTAGE
1.	NO	93	80%
2.	YES	27	20%
	TOTAL	120	100%

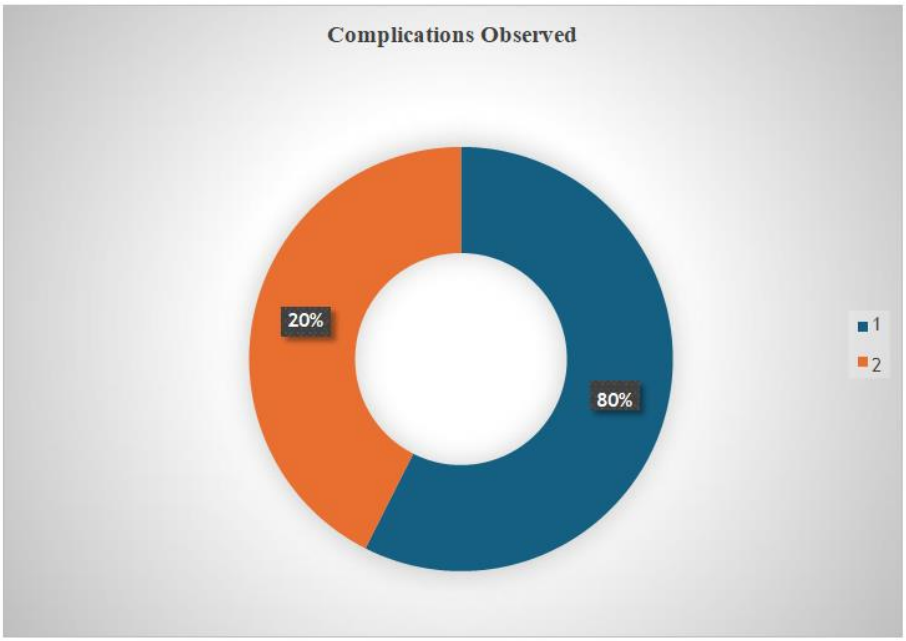

Fig. 14: Pie Diagram Showing Complications observed.

Out of the total 120 patients included in the study, 93 patients (80%) did not experience any complications, whereas 27 patients (20%) developed complications. The findings indicate that the majority of the patients did not develop complications during the study period. Only a smaller proportion of patients experienced complications, suggesting that the overall occurrence of complications in the study population was relatively low. Mean value for complications observed was found to be 0.225 ± 0.418.

DISCUSSION

The present study provides valuable insights into the causative factors, management, and preventive strategies of Acute Suppurative Otitis Media in a tertiary care setting. The findings highlight the multifactorial nature of the disease and emphasize the importance of early diagnosis and intervention.

Eustachian tube dysfunction emerged as the most significant causative factor, observed in 48.3% of patients. This finding is consistent with established literature, which identifies Eustachian tube dysfunction as the primary mechanism leading to middle ear infection. The anatomical and physiological characteristics of the Eustachian tube, particularly in children, contribute significantly to disease susceptibility.

Recurrent upper respiratory tract infections were identified as another major contributing factor. These infections lead to inflammation and blockage of the Eustachian tube, creating a favorable environment for microbial growth. Poor hygiene and overcrowded living conditions were also found to be significant contributors, indicating the role of socio-economic factors in disease prevalence.

Improper feeding practices, especially bottle feeding in a supine position, were associated with an increased risk of ASOM. This practice facilitates the entry of milk into the nasopharynx, leading to irritation and infection of the Eustachian tube. Passive smoking was also identified as a risk factor, as exposure to tobacco smoke impairs mucociliary clearance and increases susceptibility to infections.

The clinical presentation observed in this study, including ear pain, fever, hearing loss, and ear discharge, aligns with classical features of ASOM reported in previous studies. Most patients responded well to standard medical management, which included antibiotic therapy, analgesics, and supportive care.

Amoxicillin was the most commonly prescribed antibiotic, consistent with current clinical guidelines. In cases of severe infection or treatment failure, second-line antibiotics such as ceftriaxone were used. Adjunct therapies such as nasal decongestants and antihistamines were also utilized in selected cases.

The majority of patients showed significant clinical improvement, indicating the effectiveness of current treatment protocols. However, a small number of patients developed complications, highlighting the need for early intervention and continuous monitoring.

Preventive strategies such as improving personal hygiene, promoting correct feeding practices, avoiding passive smoking, and ensuring proper immunization were emphasized during patient counseling. These measures play a crucial role in reducing the incidence and recurrence of ASOM.

Despite its strengths, the study has certain limitations, including a relatively small sample size and short duration. Additionally, being a single-center study, the findings may not be generalizable to a larger population. Further multicentric studies with larger sample sizes are recommended.

Overall, the study underscores the importance of addressing both medical and environmental factors in the management and prevention of Acute Suppurative Otitis Media.

CONCLUSION

Acute Suppurative Otitis Media remains a significant health concern, particularly among children. Identification of risk factors such as Eustachian tube dysfunction, poor hygiene, and improper feeding practices is essential.

Early diagnosis and appropriate treatment significantly improve patient outcomes. Preventive strategies including health education, vaccination, and lifestyle modifications can reduce disease incidence and recurrence.

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Conflict of Interest

No conflict of interest.

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