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A CLINICAL STUDY AND MANAGEMENT OF ACUTE OTITIS MEDIA IN PAEDIATRIC AGE GROUP

Dr. Aditya D Biradar[1], Dr. Palukuri Tejaswini[2]

Senior Resident, Department of Otorhinolaryngology, Subbaiah Institute of Medical Sciences, Purle, Shivamogga-577222, Karnataka, India. ORCID ID: 0009-0005-4933-0646

Senior Resident, Department of Otorhinolaryngology, Vijayanagara Institute of Medical Sciences, Cantonment, Ballari-583104, Karnataka, India. ORCID ID: 0009-0005-3929-547X

Name and address for correspondence:Dr. PALUKURI TEJASWINI
Senior Resident,Department of Otorhinolaryngology,Plot no.61, Sri Sai Teja
6th cross, Hanuman nagar,Behind MG Petrol Bunk, 583101
BALLARI, Karnataka, India
Mobile Number: 8722402855
Email: tejupubba@yahoo.in
ORCID Id: 0009-0005-3929-547X

ABSTRACT

Background: AOM is the most common cause of opd visits amongst paediatric age group.The objectives of this study are to study the different modes of presentation of acute otitis media in paediatric patients , to study the predisposing risk factors for AOM and the response to appropriate treatment

Methods: This prospective study was conducted in Vijayanagara institute of medical sciences, Ballari during study period from January 2021 to June 2022.Seventy five patients who were diagnosed as AOM after history taking and clinical examination were included.They were treated accordingly and were followed up to assess the persistence of symptoms or signs.They also underwent X ray of nasopharynx for adenoid hypertrophy, which was graded according to a study conducted by Cohen and Konak

Results: In our study , out of 75 patients, 61(81.4%) had complaints of earache Out of 75 patients , 40(53.3%) were irritable or had history of excessive crying , 16(21.3%) had restlessness at night, 57(76%) had coryzal symptoms , 57(76%) had coryzal symptoms, fever was present in 42(56%) of our patients .Most common age group involved in the study was between 6 to 10 years (36%) followed by patients between 1 to 5 years (30.7%) and 11 to 13years (20%).In 9 patients with bilateral AOM features , 5 had tonsillitis and pharyngitis.

Patients with features of effusion and severe AOM were prescribed mucolytics.Oral antihistamines and decongestants were given to only those patients with features of rhinitis.

Patients with features of adenoid hypertrophy/sinusitis/pharyngitis/tonsillitis took more time for recovery as compared to those without.

Conclusion: This study gives us various modes of examination and management strategy which influence the recovery and reduce patient's morbidity

Keywords: AOM, ear ache, adenoid hypertrophy, paediatric

INTRODUCTION

Otitis media including, acute otitis media (AOM) and otitis media with effusion (OME, also known as 'glue ear'), is one of the most common childhood conditions. While closely related, AOM and OME are two different, distinct conditions. AOM is characterized by the presence of middle ear effusion together with an acute onset of signs and symptoms caused by middle ear inflammation. Symptoms of AOM include earache in older children; or pulling, tugging, or rubbing of the ear or nonspecific symptoms such as fever, irritability, or poor feeding in younger children. AOM signs include a distinctly red, yellow, or cloudy tympanic membrane. AOM diagnosis is strengthened by the presence of a bulging tympanic membrane, an air-fluid level

behind the tympanic membrane, tympanic perforation, and/or discharge in the ear canal.[1]

Acute otitis media affects over 80% of children before their third birthday and 30-45% of these children have suffered 2 or more episodes.[2] AOM is also a common complication of upper respiratory tract infection whose pathogenesis involves both bacteria and viruses.[3] Pathogenic colonization rates were significantly higher in infants with AOM.[4] Current clinical studies show that immediate antibiotic therapy is not necessary in most children suffering from uncomplicated AOM. Age and severity of symptoms play a critical role in going for antibiotic therapy.[5] Watchful waiting for AOM management is extensively studied and have been found to be cost effective and with satisfactory outcomes.[6] Breastfeeding by using the right techniques would reduce both upper respiratory tract infection and AOM risks.[4] Keeping in mind the prevalence and clinical impact of AOM on paediatric age group, its clinical study is being carried out.

MATERIALS AND METHODS:

Objectives:

The objectives of this study are:

1. To study the different modes of presentation of acute otitis media in paediatric patients attending ENT OPD at VIMS Ballari.
2. To study the predisposing risk factors for AOM.
3. To study the response to appropriate treatment.

METHODOLOGY

Study setting:

This study was carried out in the Department of ENT, Vijayanagara Institute Of Medical Sciences, Ballari.

Study duration:

This study was carried out during this period: January 2021 to June 2022.

Study design:

Prospective study was conducted during this period.

Study population:

Includes 75 patients of paediatric age group between 0 to 13 years of age group, of both the sexes attending VIMS, E.N.T. department and also the patients referred from other departments of combined hospitals of MCH, VIMS, BALLARI.

Inclusion criteria:

Patients who were diagnosed as acute otitis media and less than or equal to 13 years of age, included in the study.

Exclusion criteria:

1. Paediatric age group patients with history of trauma to ear
2. Patients with diagnosed malignancy.

Methods of data collection:

The proforma was designed based on the objectives of the study. As per the enclosed proforma, detailed history was taken regarding the occurrence of symptoms, duration of symptoms, previous history of AOM, any risk factors associated. Followed by thorough ENT examination, head and neck examination and systemic examination was done.

A clinical diagnosis of acute otitis media was made based on the combination of symptoms and evidence of inflammation of the middle ear cleft and evidence of middle ear effusion.

Once the diagnosis was confirmed as AOM, all the patients were treated with medical line of management.

Antibiotics

Analgesics

They were followed up at 5,10 and 15 days and were assessed for the persistence of symptoms and signs.

X ray nasopharynx for adenoid hypertrophy was graded according to a study conducted by Cohen and Konak

Working indices:

Analysis of data:

The data thus obtained was analysed and presented in the form of tables, figures, graphs wherever necessary.

The findings are discussed in the light of findings in other similar studies conducted elsewhere based on the objectives of the study in the foregoing chapters

RESULTS

75 patients with AOM were enrolled in this study irrespective of sex.

Table 1 : Gender Distribution of patients.

Gender	No of cases	Percent
Male	39	52.0
Female	36	48.0
Total	75	100.0

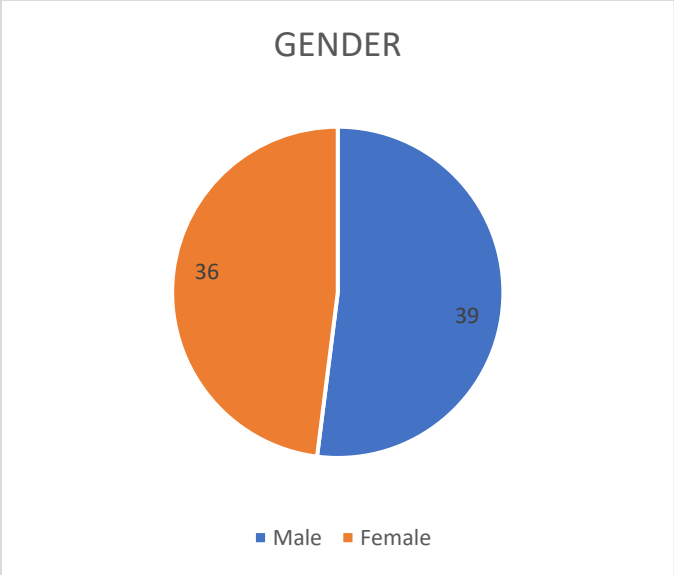

CHART 1: Gender distribution

This Study population showed male preponderance. Out of 75 patients included in the study, 39(52%) were males and 36(48%) were females.

Table 2 : Distribution of patients according to age group.

Age in Yrs	No of cases	Percent
< 1	10	13.3
1-5	23	30.7
6-10	27	36.0
11-13	15	20.0
Total	75	100.0

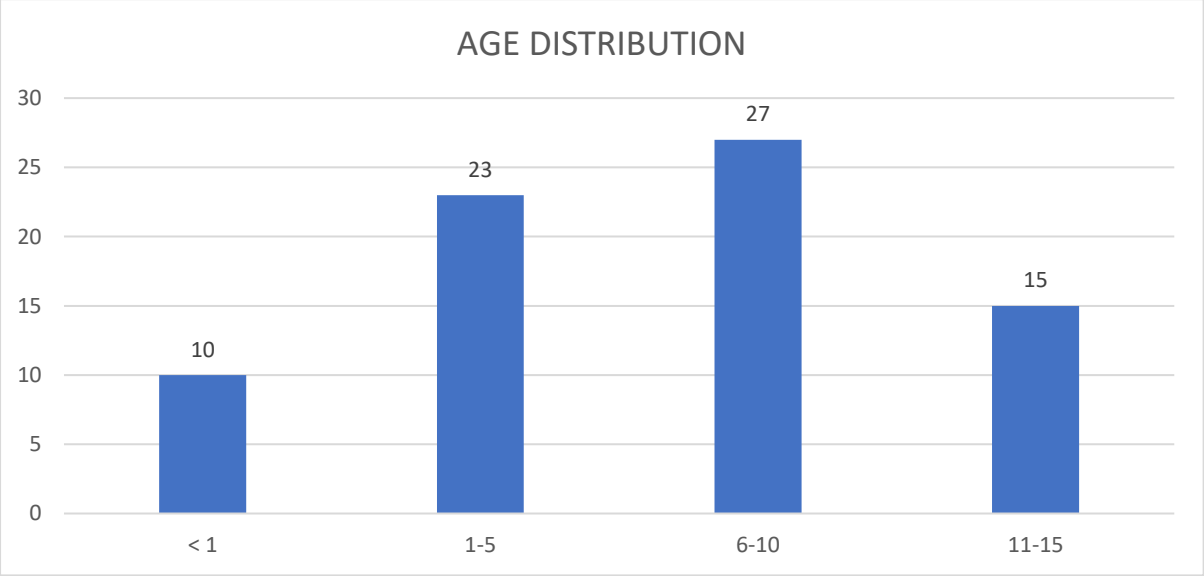

Chart 2: Age Distribution

The study included patients ranging from less than a year to 13 years. Most common age group involved in the study was between 6 to 10 years (36%) followed by patients between 1 to 5 years (30.7%) and 11 to 13years (20%).

Table 3 : Distribution of patients according to socioeconomic status.

Socioeconomic Status	No of cases	Percent
Lower	36	48.0
Middle	39	52.0
Total	75	100.0

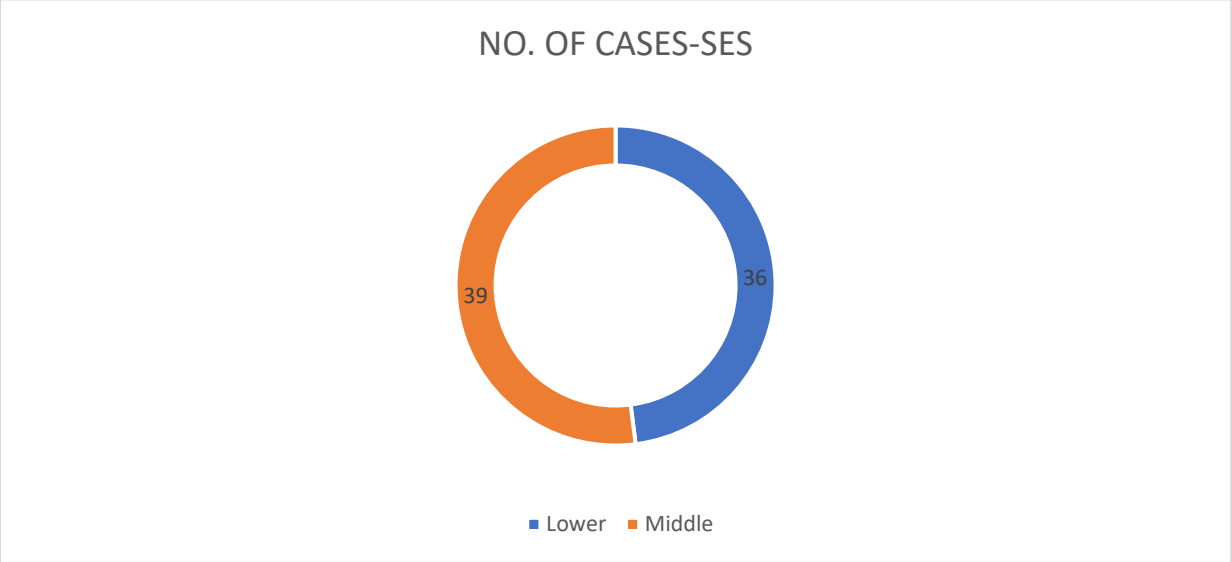

Chart 3: Socioeconomic status distribution

Most patients in our study belonged to middle socioeconomic class that is 39(52%) and 36(48%) belonged to lower socioeconomic class.

Table 4 : Distribution of patients according to their chief complaints

Symptoms		No of cases	Percent
EARACHE(P/A)	Right	38	50.7
	Left	23	30.7
FEVER(P/A)		42	56
NIGHT RESTLESSNESS(P/A)		16	21.3
OTORRHOEA	Right	1	1.3
	Left	4	5.3
HEARING LOSS	Right	2	2.7
	Left	1	1.3
RUBBING OF EAR	Right	13	17.3
	Left	10	13.3
IRRITABILITY/EXCESSIVE CRYING		40	53.3
POOR FEEDING		36	48
CORYZAL SYMPTOMS		57	76
MOUTH BREATHING		24	32
NASAL DISCHARGE		46	61.3
COMPLICATIONS		1	1.3

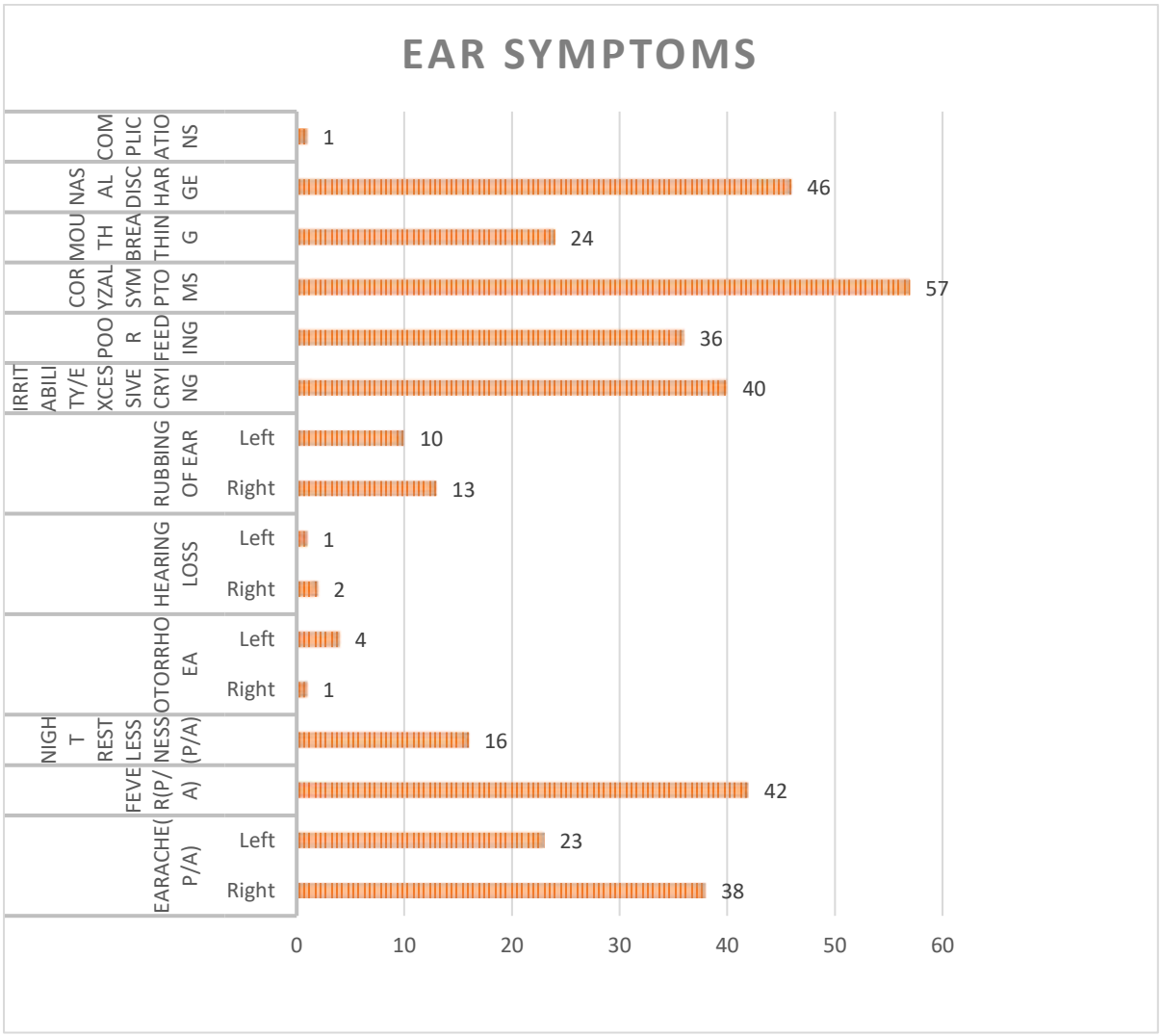

Chart 4: Frequency of chief complaints.

Out of 75 patients,

61(81.4%) had complaints of earache ,

42(56%) had fever ,

16(21.3%) had restlessness at night ,

5(6.6%) had otorrhoea ,

3(4%) had hearing loss ,

23(30.6%) had complaints of rubbing of ear ,

40(53.3%) were irritable or had history of excessive crying ,

36(48%) were poorly feeding ,

57(76%) had coryzal symptoms ,

24(32%) had history of mouth breathing ,

46(61.3%) had nasal discharge and

1(1.3%) had complications related to AOM that was mastoiditis.

Table 5 : Distribution of patients according to the duration of symptoms

DURATION OF SYMPTOMS IN DAYS	No of cases	Percent
< 1	9	12.0
1	35	46.7
2	27	36.0
3	3	4.0
4	1	1.3
Total	75	100.0

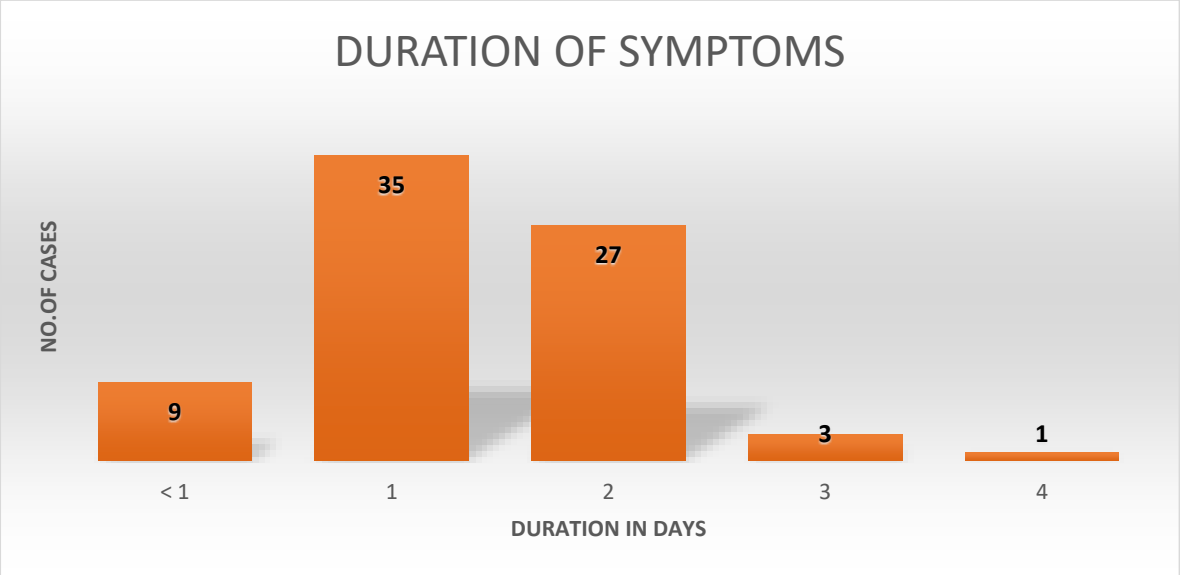

Chart 5: Duration of symptoms frequency graph.

Out of 75 patients , maximum number of patients that is 35(46.7%) presented to OPD with a symptom period of 1 day , whereas 27(36%) had a symptom period of 2 days , while others had 9(12%) , 3(4%) , 1(1.3%) had symptom period of <1 , 3 and 4 days respectively.

Table 6 : Distribution of patients with previous H/O AOM

PREVIOUS H/O AOM	No of cases	Percent
Present	30	40.0
Absent	45	60.0
Total	75	100.0

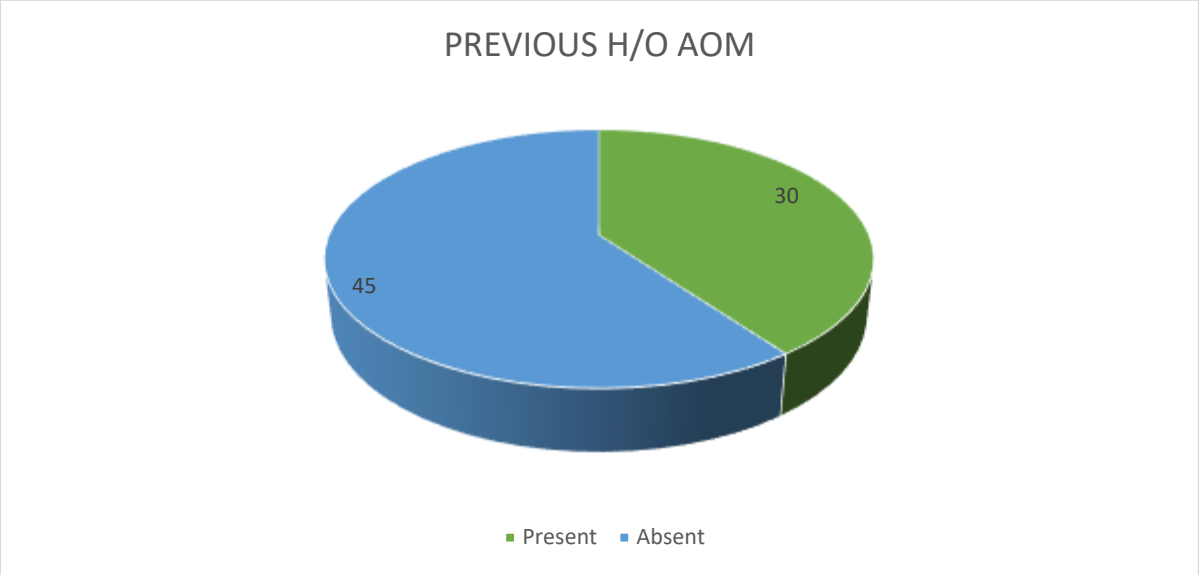

Chart 6: Graph showing frequency of patients with previous history of AOM

In our study , 45 cases(60%) had no previous H/O AOM while 30 cases(40%) had a previous H/O AOM

Table 7 : Distribution of patients with H/O breastfeeding

H/O BREAST FEEDING	No of cases	Percent
Present	22	29.3
Absent	53	70.7
Total	75	100.0

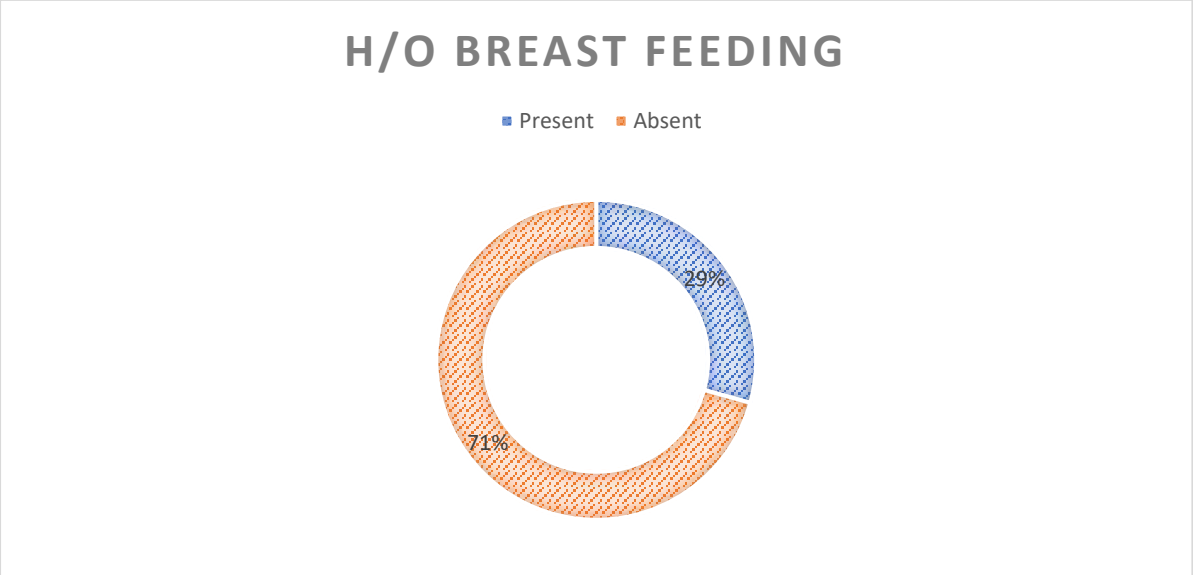

Chart 7 : Graph showing patients with active breastfeeding

History of breast feeding was there only in 22(29.3%) cases.

Table 8 : Findings on Otoscopy

TYMPANIC MEMBRANE		Right		Left		Bilateral	
		Count	%	Count	%	Count	%
APPEARANCE OF TM	CONGESTED	43	57.3	23	30.6	9	12
	NORMAL	23	30.7	43	57.3	0	0
POSITION	RETRACTED	3	4	0	0	0	0
	NORMAL	21	28	45	60	0	0
	BULGED	42	56	20	26.6	9	12
AIR FLUID LEVEL/AIR BUBBLE	Present	*1*	*1.3*	*1*	*1.3*	0	0
	Absent	*74*	*98.7*	*74*	*98.7*	0	0
MOBILITY	Normal	51	68	30	40	0	0
	Abnormal	42	56	21	28	9	12
PERFORATION	Present	*1*	*1.3*	*0*	*0*	0	0
	Absent	*74*	*98.7*	*71*	*94.7*	0	0

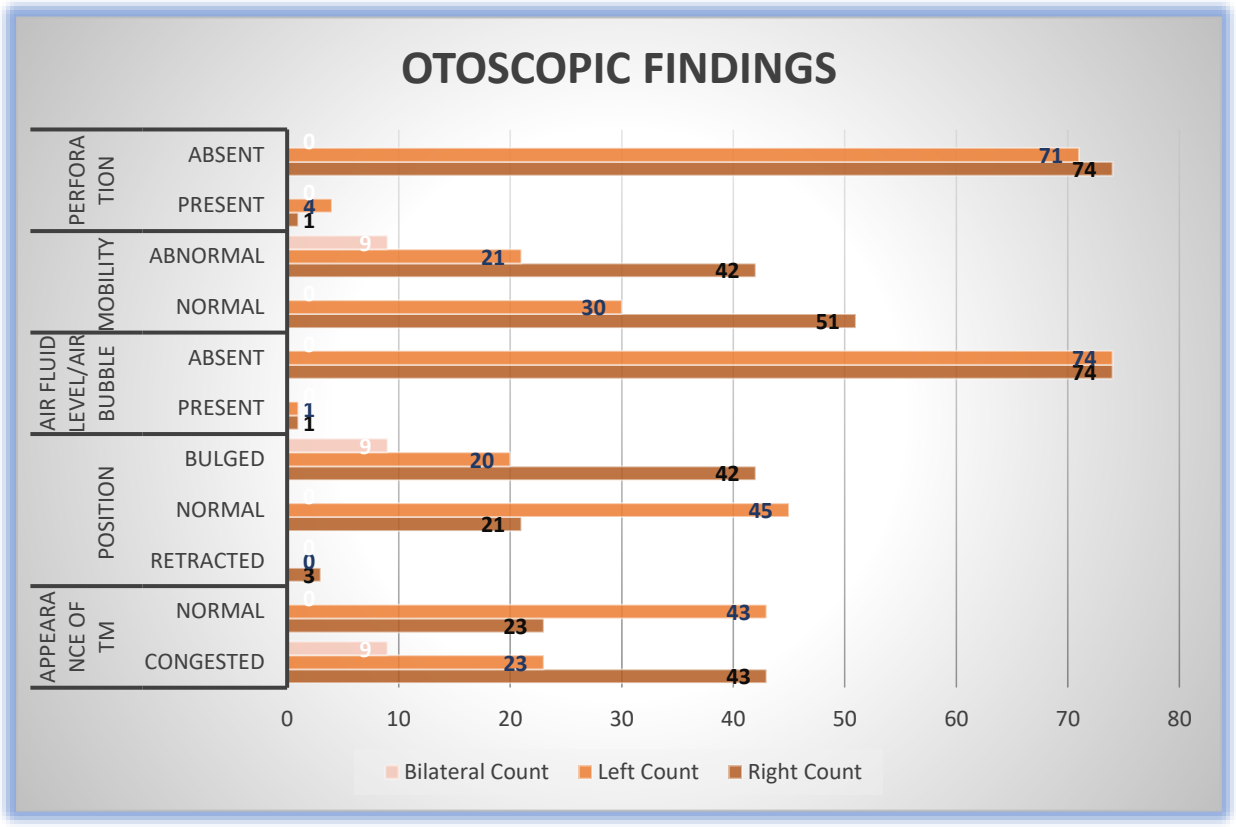

Chart 8: Bar graph showing distribution of otoscopic findings.

The evidence of AOM on otoscopic examination is observed in at least one of both the ears of patients in this study. Tympanic membrane abnormality suggestive of AOM that is 84(43 right,23 left,9 bilateral) ears showed congestion of TM , 81 ears showed bulging of TM and 3 showed retraction. Bilateral ear involvement was found to be present in 9 patients.1 among 75 patients had changes of OME with the presence of air fluid level behind an intact TM and 1 had perforation of the TM.Mobility was abnormal in 81 ears and normal in rest of the ears.

Table 9.1 : Examination of Nasal septum

NOSE EXAMINATION					
SEPTUM		Right		Left	
		Count	%	Count	%
DNS	Present	4	5.3	6	8
	Absent	71	94.7	69	92
MUCOSA	Normal	21	28	39	52
	Congested	54	72	36	48

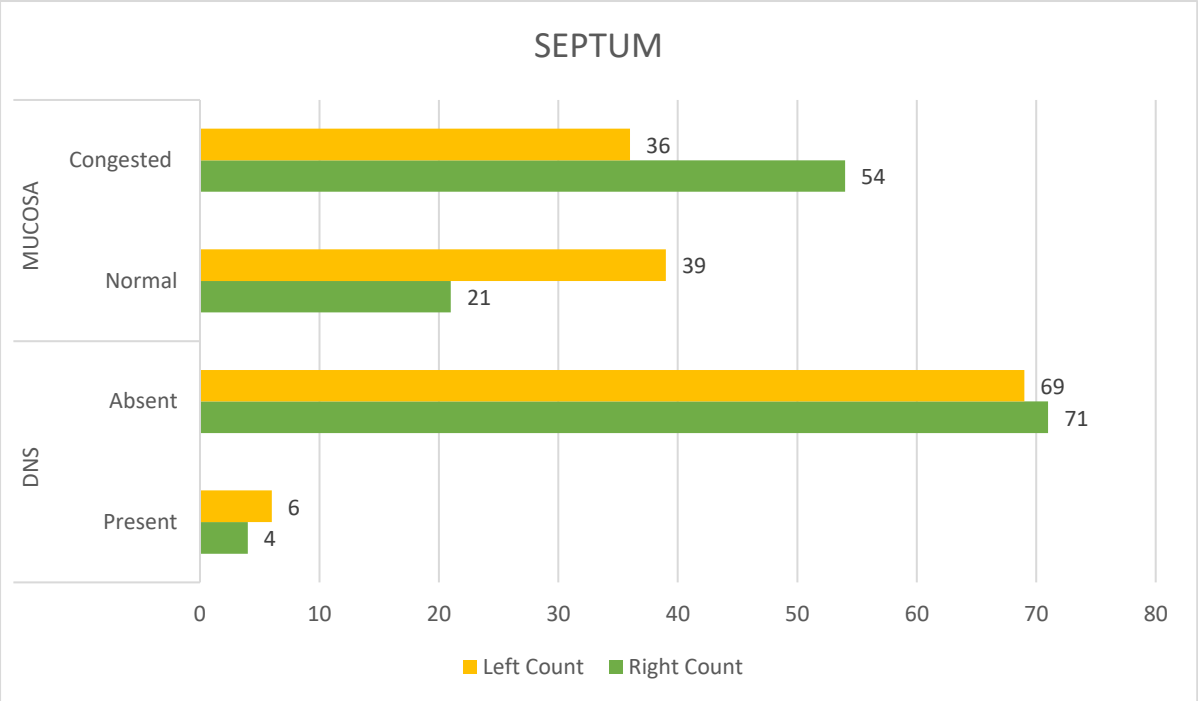

Chart 9.1: Findings of nasal septum examnination

Out of 75 cases , 4(5.3%) had DNS to right and 6(8%) to left and mucosa over the septum showed congestion in 54 patients on right side and 36 patients on left side of the nasal cavity.

Table 9.2 : Examination of Nasal cavity

NOSE EXAMINATION					
NASAL FLOOR		Right		Left	
		Count	%	Count	%
POLYP	Present	0	0	0	0
	Absent	75	100	75	100
DISCHARGE	Present	47	63	48	64
	Absent	28	37	27	36
FOREIGN BODY	Present	0	0	0	0
	Absent	75	100	75	100

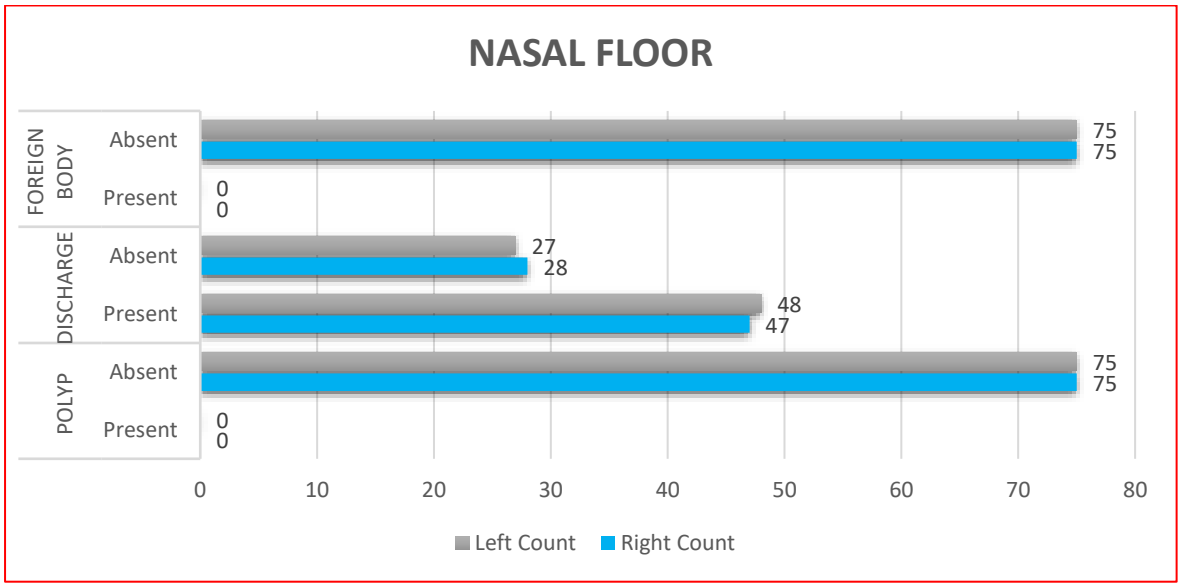

Chart 9.2 : Findings of Nasal floor

Out of 75 cases Polyp in the nasal cavity was not found in any cases.Nasal discharge was found in significant number of cases that is 47 patients had discharge in right nasal nasal cavity and 48 patients had in left nasal cavity out of which 8 patients had in bilateral nasal cavities.Foriegn body was not found in any cases.

Table 9.3: Lateral wall of Nose Examination

NOSE EXAMINATION					
LATERAL WALL		Right		Left	
		Count	%	Count	%
IHT	Present	5	7	5	7
	Absent	70	93	70	93
MUCOSA	Normal	51	68	57	76
	Congested	24	32	18	24

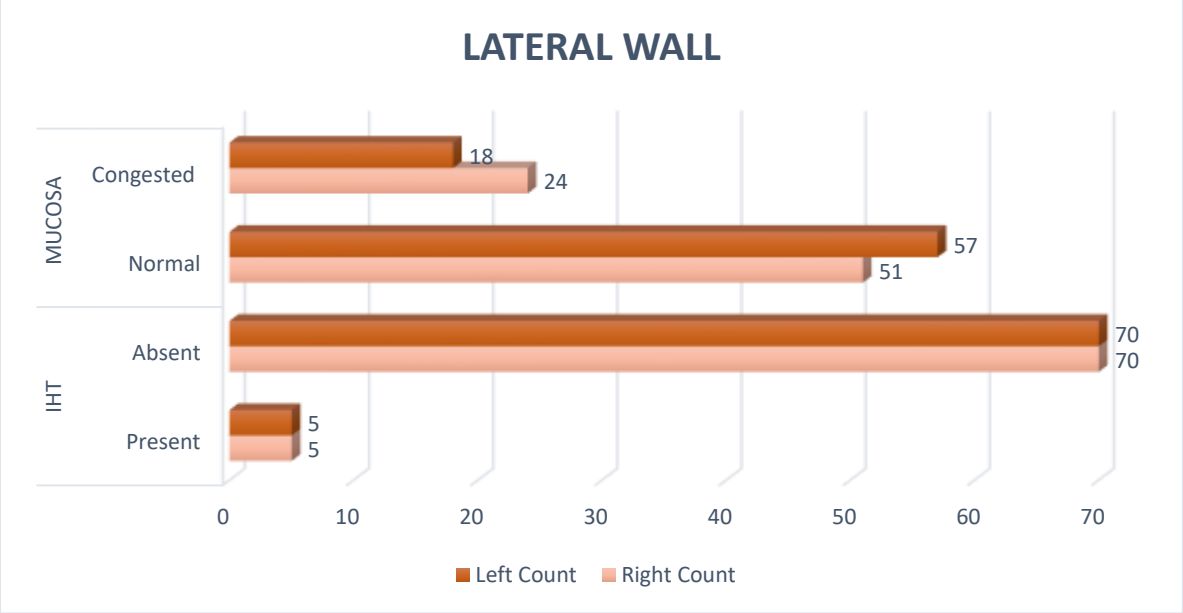

Chart 9.3 : Lateral wall of nose examination

Out of 75 patients Inferior turbinate hypertrophy was found in 5 (7%)patients and congested mucosa was found in 24 patients on right side and 18 patients on left side and out of which 5 patients had bilateral involvement.

Table 10: Swellings in the neck

NECK EXAMIN ATION		
TENDER SWELLINGS	No of cases	Percent
Right	2	1.5
Left	1	0.75
Bilateral	4	3

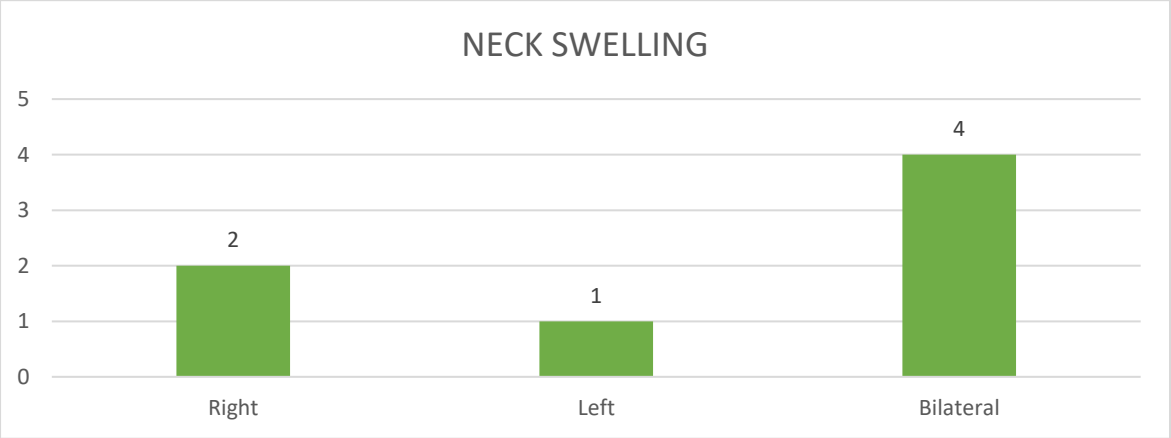

Chart 10 : Neck examination findings.

Out of 75 children with AOM , 2(1.5%) had neck swelling over the right side , 1(0.75%) had on the left side and 4 cases(3%) had bilateral neck swellings

Table 11: Throat Examination findings.

THORAT EXAMINATION		No of cases	Percent
POSTERIOR PHARYNGEAL WALL	Congested	29	39
	Normal	46	61
TONSILLAR ENLARGEMENT	Present	18	24
	Absent	57	76
TONSILLITIS - PRESENT	Right	16	21
	Left	15	20
CLEFT PALATE/CLEFT LIP	Present	0	0
	Absent	75	100
CROWDING OF TEETH & NARROW UPPER ALVEOUS	Present	11	15
	Absent	64	85
ANTERIOR TONGUE POSITION &HYPOPLASTIC MAXILLA	Present	4	5
	Absent	71	95
HIGH ARCH PALATE & PROMINENT UPPER TEETH	Present	7	9
	Absent	68	91

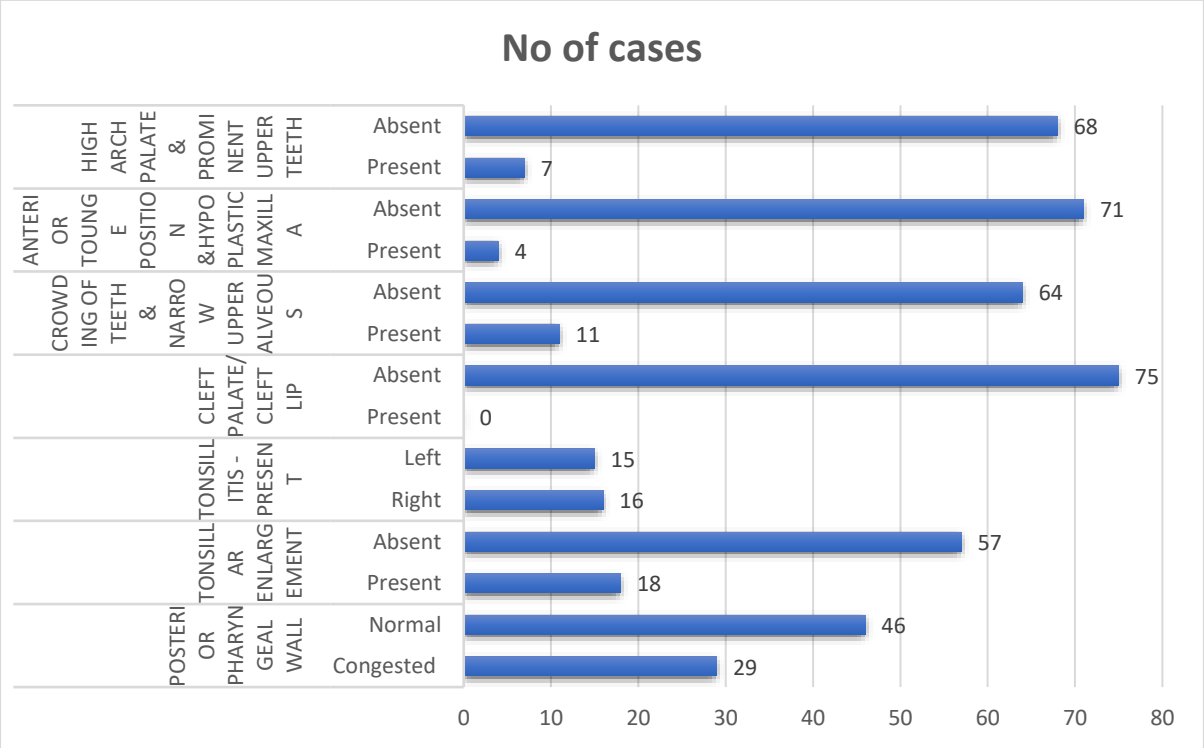

Chart 11: Throat examination findings.

Out of 75 Patients posterior pharyngeal wall congestion was noted in 29(39%) cases, tonsillar enlargement was in 18(24%) cases out of which only 16 cases had features of tonsillitis.features of adenoid enlargement were noted in 13 (16%) cases.

Table 12.1: Adenoid Hypertrophy Grading

X-RAY NASOPHARYNX		No of cases	Percent
ADENOID HYPERTROPHY	Present	21	28.0
	Absent	54	72.0
GRADE	1	4	5.3
	2	11	14.7
	3	6	8.0
	NIL	54	72.0

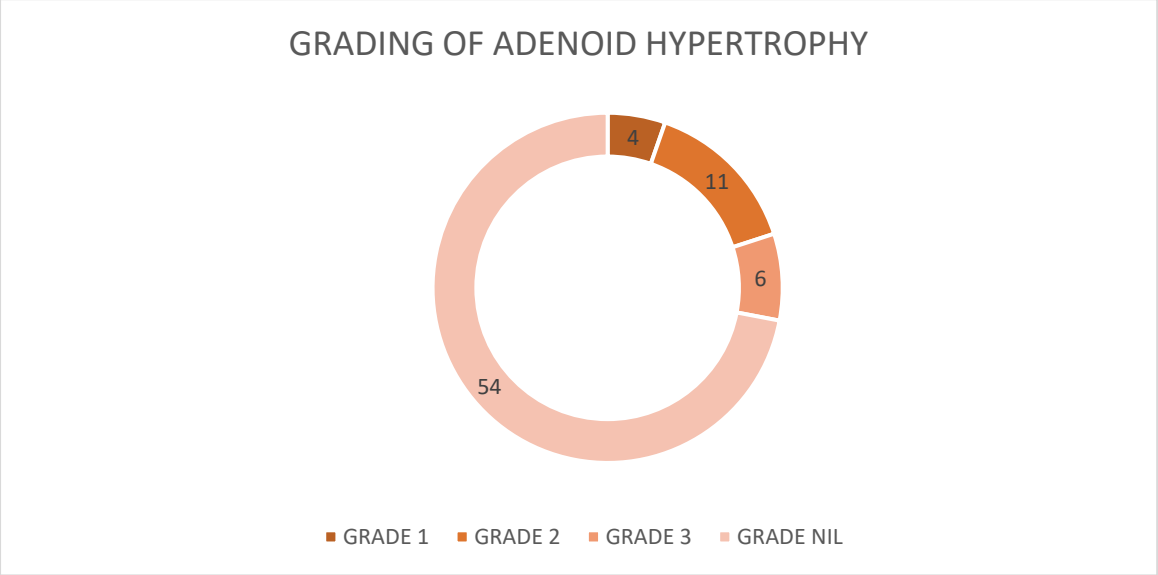

Chart 12.1: Adenoid enlargement grading

The severity of adenoid hypertrophy is assessed by x-ray soft tissue neck lateral view. Eleven patients(14.7%) had grade 2 adenoid hypertrophy , 6(8%) and 4(5.3%) had grade 3 and 1 respectively.

Table 12.2: Findings of X-ray PNS

X-RAY PNS		No of cases	Percent
SINUSITIS-HAZINESS	Present	25	33.3
	Absent	50	66.7

TOTAL	75	100.0

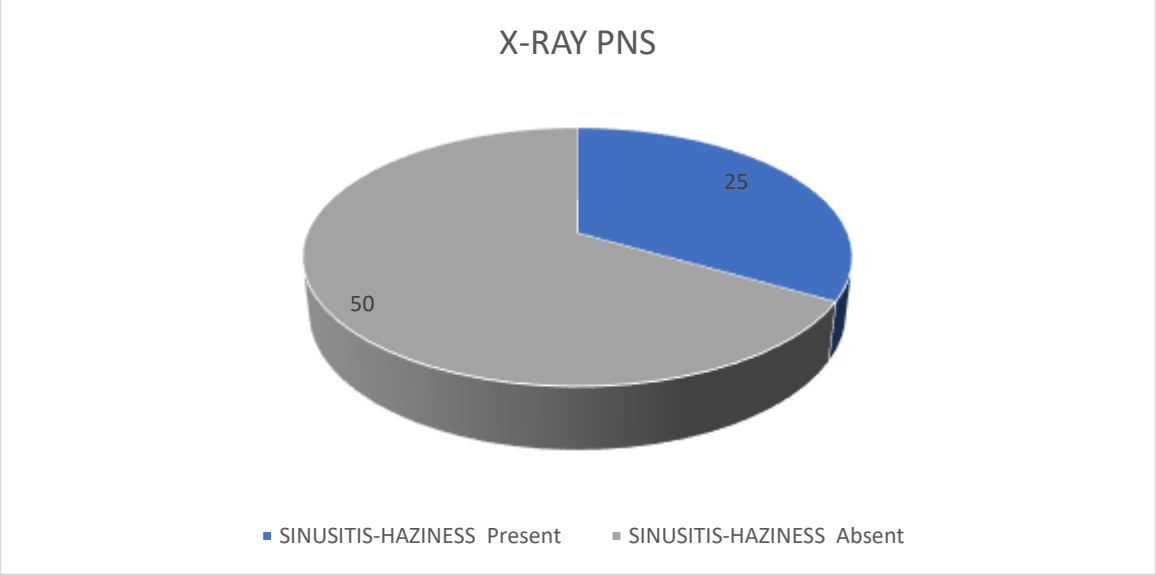

Chart 12.2 : Findings of X-ray PNS

25(33.3%) patients in the present study had haziness of sinuses on X-ray PNS.

TREATMENT

TABLE 13 : Treatment given

TREATMENT	No of cases	Percent
ANTIBIOTICS	75	100
ANALGESICS	75	100
ANTIHISTAMINES	65	86.7
MUCOLYTICS	17	22.7
TOPICAL EAR DROPS	1	1.3

NASAL DECONGESTANTS	75	100
ORAL DECONGESTANTS	65	87
MYRINGOTOMY	0	0

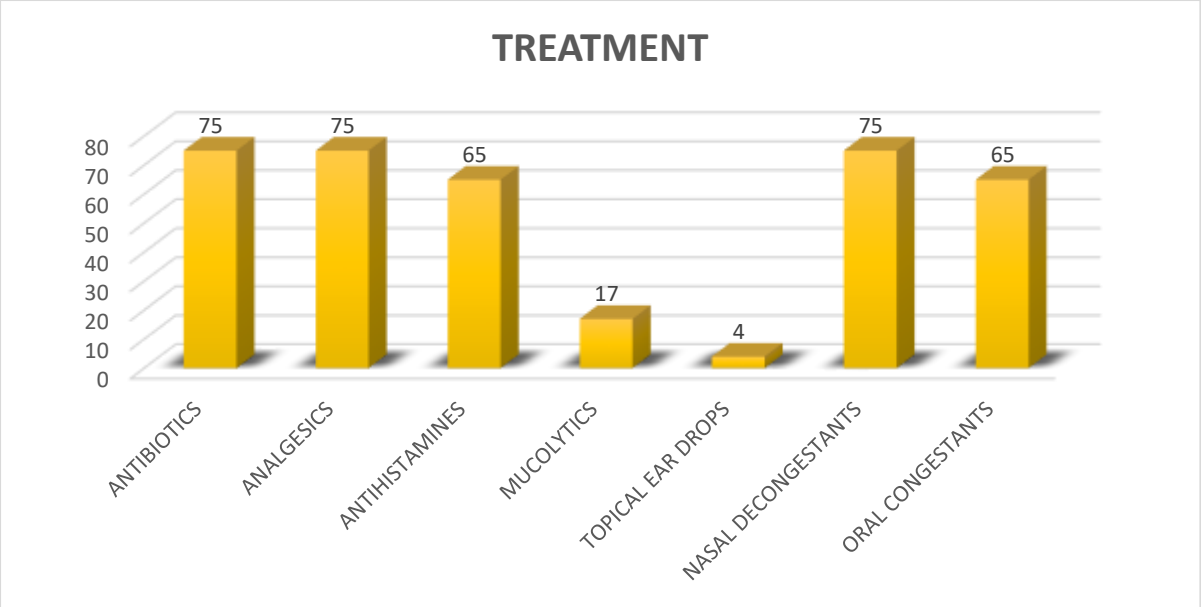

Chart 13.Treatment graph.

In our study analgesics antibiotics and nasal decongestants were given to all patients and Anti histamines were used in 65 (87%), mucolytics was used in 17(22.7%),Topical ear drops were used in 1(1.3%) cases, oral decongestants were used in 65(87%) cases. Myringotomy was considered in none of the cases.

Follow up

Table 14: Follow up

FOLLOW UP	Improved	Percent	Not improved	Percent

AT 5TH DAY	38	51	37	49
AT 10TH DAY	62	83	13	17
AT 15TH DAY	75	100	0	0

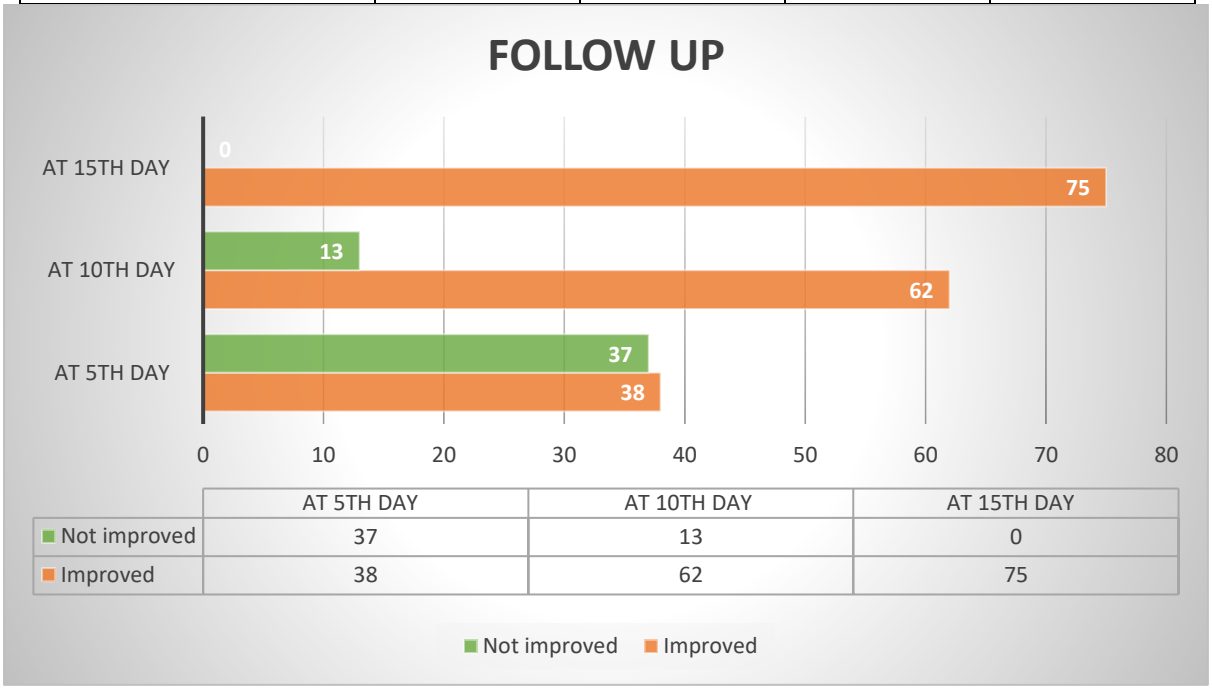

Chart 14: Follow up

When follow up was done at 5th day ,10th day and 15th day it was found that 38 cases(51%) were improved at 5th day,62(83%) at 10th day,and all patients were improved symptomatically at 15th day.

DISCUSSION

Otitis media (OM) is an umbrella term for a group of complex infective and inflammatory conditions affecting the middle ear. All OM involves pathology of the middle ear and middle ear mucosa. OM is a leading cause of healthcare visits worldwide and its complications are important causes of preventable hearing loss, particularly in the developing world.AOM is the most common cause of opd visits amongst paediatric age group.

PRESENTING SYMPTOMS

The symptoms of a critically ill child are critical in the diagnosis, treatment, and monitoring of AOM. Among practising otorhinolaryngologists, signs and symptoms are an important part of the diagnostic criteria.

Earache is a common symptom of AOM, necessitating an immediate visit to the doctor. Earache is not a guaranteed symptom of AOM, but it has been reported in 47% to 87% of children with AOM.[7,8] Earache, on the other hand, can occur in the absence of any abnormality in the ear. [9,10].In our study , out of 75 patients, 61(81.4%) had complaints of earache. Previous research has shown that the occurrence of earache in children with AOM varies with age. [7,8,11] Hayden and Schwartz[8] reported earache in 75% of children under the age of two, and 93% of older children.

In infants, ear pulling and tenderness of the preauricular area on palpation are frequently regarded as signs of AOM. Out of 75 patients , 40(53.3%) were irritable or had history of excessive crying , 16(21.3%) had restlessness at night .A recent study found that ear pulling was not indicative of AOM in the absence of URI. [12] However, 15% of the children who were initially brought in with a chief complaint of ear pulling also had AOM.

In our study , 57(76%) had coryzal symptoms , 57(76%) had coryzal symptoms which is almost similar to a study conducted by Marjo Niemal et al [13]

Fever was present in 42(56%) of our patients which is more as compared to a study by Marjo Niemal et al [13]

AGE

The study included patients ranging from less than a year to 13 years. Most common age group involved in the study was between 6 to 10 years (36%) followed by patients between 1 to 5 years (30.7%) and 11 to 13years (20%).

This is not similar to other studies , as other studies showed the most common age of presentation was 1st 6 months to 12months of life [14].Maybe , this disparity is because the children in that age group usually present more commonly to Paediatrics department than Otorhinolaryngology.

GENDER

In our study , the males affected were 39 and females 36 , it is is accordance with the study conducted by Kero et al [15]

OTOSCOPIC EXAMINATION

In the present study , 43 patients had congestion of tympanic membrane in the right ear and 23 in the left and 9 had bilateral TM congestion.Amongst which ,3 patients had retraction of tympanic membrane and 71 had bulged tympanic membranes. About the mobility of TM , only 3 patients with congested tympanic membrane showed to have normal mobility while all

others had abnormal mobility.These results are almost similar to a study conducted by Liberthal et al [16]

EXAMINATION OF NASAL CAVITY , THROAT

In our study , among 10 patients with DNS , 4 had congestion of the tympanic membrane on the side of deviation.Almost all cases with congested tympanic membrane had congestion of nasal mucosa.

And in 9 patients with bilateral AOM features , 5 had tonsillitis and pharyngitis.

X-RAY NASOPHARYNX

18 patients amongst 21 showing adenoid hypertrophy had features of either tonsillitis or pharyngitis or both.All patients with grade 3 adenoid hypertrophy had both tonsillitis and pharyngitis which can lead to eustachian tube dysfunction and AOM and 10 amongst 11 grade 2 adenoid hypertrophy had tonsillitis or pharyngitis or both.

TREATMENT

Only 1 patient with TM perforation was given topical ear drops.Patients with features of effusion and severe AOM were prescribed mucolytics.Oral antihistamines and decongestants were given to only those patients with features of rhinitis.

Patients with features of adenoid hypertrophy/sinusitis/pharyngitis/tonsillitis took more time for recovery as compared to those without.

CONCLUSION

Acute otitis media is one of the most common childhood disease, but also seen in adolescents and adults.Knowledge of etiological factors which results in AOM are very much helpful for an accurate diagnosis and modes of management of the same are helpful to avoid complications of the same.

Our study revealed the following :

Acute Otitis Media was prevalent in 6-10 years of age group , the reason for disparity to literature being the presentation of 6-12m age children to paediatric department.

The predominant symptoms being U/L or B/L earache , fever , excessive crying/irritability ,nasal discharge ,and coryzal symptoms were most common in all the individuals.Almost all children with adenoid hypertrophy had bilateral AOM and took time for recovery.

History of breastfeeding was present in almost all the patients with AOM below 3 years of age which might be a contributing factor for the same.

History of throat pain and nasal symptoms should be asked for as they might have eustachian tube obstruction due to these symptoms and treatment of the same will aid in faster recovery.

Otoscopic examination , pneumatic otoscopy coupled with anterior rhinoscopy aids in better diagnosis of the condition. Imaging of the sinuses and nasopharynx for adenoid hypertrophy helps us to ruleout the cause for bilateral eustachian tube obstruction which leads to persistent AOM.

Pneumatic otoscopy is a better modality to examine the tympanic membrane findings and mobility of the same as compared to routine otoscopic examination.

Diagnostic nasal endoscopy should be done for findings in the nasal cavity contributing to AOM and to check for adenoid hypertrophy .As the most common presentation is in paediatric age group who are mostly not cooperative for DNE , anterior rhinoscopy and digital imaging for adenoid hypertrophy were carried out in our study.

Rhinitis and adenoid hypertrophy were found to be the contributing factors for AOM in our study.

AOM can be mainly managed by Antibiotics + Analgesics + Antihistamines + Nasal decongestants +/- Oral decongestants +/- Mucolytics and proper breast feeding techniques and treating the predisposing factors. Topical ear drops are only used if there is a perforation of the tympanic membrane and myringotomy is not routinely done for AOM.

Though all patients does not require antibiotic therapy , it is a routine practice in our setup to prescribe antibiotics.Otherwise symptomatic treatment with analgesics , decongestants and proper breastfeeding practices with a proper followup will suffice.For children with adenoid hypertrophy and sinusitis , the same should be treated first to avoid persistence or recurrence of the disease.

Our study entitled “A prospective clinical study and management of acute otitis media in paediatric age group” brings light on various etiological factors , modes of examination and management which influence the recovery and reduce patient’s morbidity.

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