

Evaluation of Squeal of Otitis Media with Effusion in Children

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Abstract

Objectives: The aim of study is to evaluate and assess squeal of otitis media with effusion in children.

Methods: Cross sectional retrospective study was admitted to children in age range 1 to 15 years old, all children who diagnosed as otitis media with effusion. Patients who came to outpatient complaining of deafness, acute or chronic rhino sinusitis, snoring, sleep apnea, atopy and diagnosed as otitis media with effusion included in this study. Full otolaryngological examination done for these patients including otoscopic examination, anterior rhinoscopy and nasal endoscopy. Documented cases of OME by aural otoscopy included in this study. Change of color and position of tympanic membrane, fluid level, retracted tympanic membrane considered as signs of otitis media with effusion. These patient submitted to tympanometry to confirm the diagnosis of effusion.

Results: 252 kids have otitis media, mean age of them 9.2 ± 3.5 years old. (70.6%) of babies are males and (29.4%) are females. (42.9%) of babies are at age group 6–10 years. According to symptoms appear; (73%) of them have bilateral effusion. (43.7%) of babies have rhinitis. Just (9.9%) of them have atopy. (25%) of them have snoring. Just (7.5%) of babies have apnea. According to management types; (79.8%) have medical treatment and (20.2%) have surgical management. There is significant association between age groups and site of effusion. There is significant association between site of effusion and snoring, medical treatment, surgical procedure and recurrent of effusion.

Conclusion: In current study males' babies are more have OM with effusion. And most age group that have OM is 6–10 years old, most OM with effusion occur bilaterally and associated with rhinitis. There is association between site of effusion and snoring, medical treatment, surgical procedure and recurrent of effusion.

Keywords: Evaluation, squeal, otitis media, effusion, children

Introduction

Otitis media with effusion (OME) defined as the presence of fluid in the middle ear without signs or symptoms of acute ear infection.^{1,2} OME is considered different from acute otitis media (AOM), which is defined as a history of acute onset of signs and symptoms, the presence of middle-ear effusion, and signs and symptoms of middle-ear inflammation. Persistent middle-ear fluid from OME results in decreased mobility of the tympanic membrane and serves as a barrier to sound conduction.³ OME may occur spontaneously because of poor Eustachian tube function, or as an inflammatory response following AOM. About 90% of children (80% of individual ears) have OME at some time before school age,⁴ most often between ages 6 months and 4 years.⁵ In the first year of life, more than 50% of children will experience OME, increasing to more than 60% by age 2 years.⁶ Many episodes resolve spontaneously within 3 months, but about 30 to 40% of children have recurrent OME and 5 to 10% of episodes last 1 year or longer.⁷ The primary outcomes considered in the guideline include hearing loss; effects on speech, language, and learning; physiologic sequelae; health care utilization (medical, surgical); and quality of life.^{1,2,8} The high prevalence of OME, difficulties in diagnosis and assessing duration, increased risk of conductive hearing loss, potential impact on language and cognition, and significant practice variations in management⁸ make OME an important condition for the use of up-to-date evidence-based practice guidelines.⁸ The aim of study is to evaluate and assess squeal of otitis media with effusion in children.

Methods

This retrospective study was admitted to children in age range 1 to 15 years old, data collected in outpatient of Kirkuk general

hospital between December 2016 to April 2021 to all children who diagnosed as otitis media with effusion. Patients who came to outpatient complaining of deafness, acute or chronic rhino sinusitis, snoring, sleep apnea, atopy and diagnosed as otitis media with effusion included in this study. Full otolaryngological examination done for these patients including otoscopic examination, anterior rhinoscopy and nasal endoscopy. Documented cases of OME by aural otoscopy included in this study. Change of color and position of tympanic membrane, fluid level, retracted tympanic membrane considered as signs of otitis media with effusion. These patient submitted to tympanometry to confirm the diagnosis of effusion. Patients with acute otitis media, craniofacial abnormality, effusion for less than three months were excluded from this study. Medical treatment started as local decongestant for short duration (one week), systemic decongestant, local steroid drop for one month, six days' antibiotic added to those have rhino sinusitis, antihistamine to atopy patients. Auto inflation advice to all patients. Follow up every month up to three months, those who respond to medical treatment recorded, persistent effusion referred for surgical intervention, grommet/adenoidectomy. Shepherd grommet inserted after anterioinferior myringotomy. Adenoidectomy done by curettage method. Post-operative follows up 3, 6, 1 year done and recurrence and tympanic membrane perforation recorded. Statistical analysis done by SPSS 22, frequency and percentage used for categorical data, mean, median and SD for continuous data. Chi-square used for assessed association between variables. *P*-value less or equal to 0.05 is consider significant.

Results

Cross sectional study of 252 kids have otitis media, mean age of them 9.2 ± 3.5 years old. (70.6%) of babies are males and

(29.4%) are females. (42.9%) of babies are at age group 6–10 years. According to symptoms appear; (73%) of them have bilateral effusion. (43.7%) of babies have rhinitis. Just (9.9%) of them have atopy. (25%) of them have snoring. Just (7.5%) of babies have apnea. According to management types; (79.8%) have medical treatment and (20.2%) have surgical management. As shown in Tables 1–4.

As shown in Table 5; there is no any significant association between gender and symptoms, management types and complications.

As shown in Table 6; there is significant association between age groups and site of effusion, (83.3%) of bilateral effusion occur at age group 6–10 years, (74.6%) of bilateral effusion occur at age group 1–5 years. There is no any significant association between age groups and symptoms, management types and complications.

Table 1. Distribution of gender and age groups

Variables		Frequency	Percentage
Gender	Females	74	29.4
	Males	178	70.6
Age groups	1–5	67	26.6
	6–10	108	42.9
	>10	77	30.6

Table 2. Distribution of symptoms

Variables		Frequency	Percentage
Site	Unilateral	68	27.0
	Bilateral	184	73.0
Rhinitis	No	142	56.3
	Yes	110	43.7
Atopy	No	227	90.1
	Yes	25	9.9
Snoring	No	189	75.0
	Yes	63	25.0
Apnea	No	233	92.5
	Yes	19	7.5

Table 3. Distribution of management types

Variables		Frequency	Percentage
Medical	No	51	20.2
	Yes	201	79.8
Surgical	No	201	79.8
	Yes	51	20.2

Table 4. Distribution of complications

Variables		Frequency	Percentage
Recurrent	No	241	95.6
	Yes	11	4.4
Perforation	No	250	99.2
	Yes	2	.8

Table 5. Significant association between gender and symptoms, management types and complications

Variables		Gender		P-value
		Females	Males	
Site	Unilateral	15	53	0.16
		20.3%	29.8%	
	Bilateral	59	125	
		79.7%	70.2%	
	Total	74	178	
		100.0%	100.0%	
Rhinitis	No	37	105	0.2
		50.0%	59.0%	
	Yes	37	73	
		50.0%	41.0%	
	Total	74	178	
		100.0%	100.0%	
Atopy	No	67	160	1.000
		90.5%	89.9%	
	Yes	7	18	
		9.5%	10.1%	
	Total	74	178	
		100.0%	100.0%	
Snoring	No	56	133	1.000
		75.7%	74.7%	
	Yes	18	45	
		24.3%	25.3%	
	Total	74	178	
		100.0%	100.0%	
Apnea	No	68	165	0.8
		91.9%	92.7%	
	Yes	6	13	
		8.1%	7.3%	
	Total	74	178	
		100.0%	100.0%	
Medical TRT	No	11	40	0.23
		14.9%	22.5%	
	Yes	63	138	
		85.1%	77.5%	
	Total	74	178	
		100.0%	100.0%	
Surgical TRT	No	63	138	0.23
		85.1%	77.5%	
	Yes	11	40	
		14.9%	22.5%	
	Total	74	178	
		100.0%	100.0%	
Recurrent	No	69	172	0.3
		93.2%	96.6%	

(Continued)

Table 5. Significant association between gender and symptoms, management types and complications—Continued

Variables	Gender		P-value	
	Females	Males		
Perforation	Yes	5 6.8%	6 3.4%	1.000
	Total	74 100.0%	178 100.0%	
	No	74 100.0%	176 98.9%	
Yes	0 0.0%	2 1.1%		
Total	74 100.0%	178 100.0%		

P-value ≤0.05 (significant).

As shown in Table 7; there is significant association between site of effusion and snoring, medical treatment, surgical procedure and recurrent of effusion. Just (29.9%) of babies with bilateral effusion have snoring. (74.5%) of babies with bilateral effusion need medical treatment while (25.5%) of babies with bilateral effusion need surgical management. Just (6%) of babies with bilateral effusion have recurrent of effusion.

Discussion

The prevalence of OME in this study was 25.2%. This shows that approximately 1 in every 4 children within the age of 1 and 6 years have OME.⁹ In current the mean age of them 9.2 ± 3.5 years old. (70.6%) of babies are males and (29.4%) are females. (42.9%) of babies are at age group 6–10 years. According to symptoms appear; (73%) of them have bilateral effusion. (43.7%) of babies have rhinitis. Just (9.9%) of them have atopy. (25%) of them have snoring. Just (7.5%) of babies

Table 6. Significant association between gender and symptoms, management types and complications

Variables		Age groups			P-value
		1–5	6–10	>10	
Site	Unilateral	17 25.4%	18 16.7%	33 42.9%	0.0001
		50 74.6%	90 83.3%	44 57.1%	
	Bilateral	67 100.0%	108 100.0%	77 100.0%	
		Total	67 100.0%	108 100.0%	
Rhinitis	No	41 61.2%	60 55.6%	41 53.2%	0.6
		26 38.8%	48 44.4%	36 46.8%	
	Yes	67 100.0%	108 100.0%	77 100.0%	
		Total	67 100.0%	108 100.0%	
Atopy	No	62 92.5%	99 91.7%	66 85.7%	0.3
		5 7.5%	9 8.3%	11 14.3%	
	Yes	67 100.0%	108 100.0%	77 100.0%	
		Total	67 100.0%	108 100.0%	
Snoring	No	48 71.6%	82 75.9%	59 76.6%	0.7
		19 28.4%	26 24.1%	18 23.4%	
	Yes	67 100.0%	108 100.0%	77 100.0%	
		Total	67 100.0%	108 100.0%	
Apnea	No	59 88.1%	100 92.6%	74 96.1%	0.19
		8 11.9%	8 7.4%	3 3.9%	
	Yes	67 100.0%	108 100.0%	77 100.0%	
		Total	67 100.0%	108 100.0%	

(Continued)

Table 6. **Significant association between gender and symptoms, management types and complications—Continued**

Variables		Age groups			P-value
		1–5	6–10	>10	
Medical TRT	Total	67	108	77	0.15
		100.0%	100.0%	100.0%	
	No	19	18	14	
		28.4%	16.7%	18.2%	
	Yes	48	90	63	
		71.6%	83.3%	81.8%	
Surgical TRT	Total	67	108	77	0.15
		100.0%	100.0%	100.0%	
	No	48	90	63	
		71.6%	83.3%	81.8%	
	Yes	19	18	14	
		28.4%	16.7%	18.2%	
Recurrent	Total	67	108	77	0.9
		100.0%	100.0%	100.0%	
	No	64	103	74	
		95.5%	95.4%	96.1%	
	Yes	3	5	3	
		4.5%	4.6%	3.9%	
Perforation	Total	67	108	77	0.1
		100.0%	100.0%	100.0%	
	No	67	108	75	
		100.0%	100.0%	97.4%	
	Yes	0	0	2	
		0.0%	0.0%	2.6%	
	Total	67	108	77	
		100.0%	100.0%	100.0%	

P-value ≤0.05 (significant).

Table 7. **Significant association between site and symptoms, management types and complications**

Variables		Site		P-value
		Unilateral	Bilateral	
Rhinitis	No	35	107	0.4
		51.5%	58.2%	
	Yes	33	77	
		48.5%	41.8%	
	Total	68	184	
		100.0%	100.0%	
Atopy	No	62	165	0.8
		91.2%	89.7%	
	Yes	6	19	
		8.8%	10.3%	
	Total	68	184	
		100.0%	100.0%	

(Continued)

Table 7. Significant association between site and symptoms, management types and complications—Continued

Variables		Site		P-value
		Unilateral	Bilateral	
Snoring	No	60	129	0.003
		88.2%	70.1%	
	Yes	8	55	
	Total	68	184	
		100.0%	100.0%	
Apnea	No	66	167	0.1
		97.1%	90.8%	
	Yes	2	17	
	Total	68	184	
		100.0%	100.0%	
Medical TRT	No	4	47	0.0001
		5.9%	25.5%	
	Yes	64	137	
	Total	68	184	
		100.0%	100.0%	
Surgical TRT	No	64	137	0.0001
		94.1%	74.5%	
	Yes	4	47	
	Total	68	184	
		100.0%	100.0%	
Recurrent	No	68	173	0.04
		100.0%	94.0%	
	Yes	0	11	
	Total	68	184	
		100.0%	100.0%	
Perforation	No	68	182	1.000
		100.0%	98.9%	
	Yes	0	2	
	Total	68	184	
		100.0%	100.0%	

P-value ≤0.05 (significant).

have apnea. According to management types; (79.8%) have medical treatment and (20.2%) have surgical management. This similar to other study that state there were 130 (57.5%) males and 96 (42.5%) females. The mean age of the school pupils was 3.04 (± 0.1), that for males was 3.04 (± 1.6) and female 3.07 (± 1.4). Occupying the highest proportion (20.8%) were those aged 2 years. The prevalence of OME among the school pupils was 25.2% (57). The peak age prevalence of OME among the school pupils was 2 years (36.2%), followed by 1 year (31.1%), 3 years (23.9%), 4 years (20.5%), 5 years (16.7%), 6 years (7.1%). There was 31 (54.4%) unilateral and

26 (45.6%) bilateral OME out of the 57 pupils with OME. Fifty-eight (12.8%) of the ears had type C Tympanogram while type B was 25 (5.5%), this is as shown in Table 5. Pupils within the Pre-Nursery (1–2 years) age group were shown to be statistically significant with the occurrence of OME ($P < 0.05$).⁹ Atopy and allergic rhinitis are risk factors for OME are mixed.¹⁰ We did not find atopic diseases to be risk factors for COME. The discrepancy among studies could be explained by blocked nose or URI acting as confounders, as these conditions are associated with both allergic conditions and COME. We used a validated questionnaire for rhino conjunctivitis, eczema and

asthma, which may have improved our specificity in identifying allergic diseases.¹¹ In current study the medical treatment is important than surgical treatment this is similar to other study that state many treatment options are available medical as well as surgical. Prospective study conducted to evaluate various treatment options revealed that auto inflation of ET is the main stay of treatment. If the ET malfunction is due to any reasons like adenoids, deviated nasal septum, hypertrophied turbinates or any other cause surgical intervention of the same gives 100% results. Medical management gives good results but recurrence is equally common.¹² In current study most of babies with bilateral effusion have snoring, this is similar to other study that state the snoring is associated with a significant increase in the prevalence of recurrent otitis media and the need for tympanostomy tube placement.¹³ In current study most of babies with bilateral OM effusion need medical treatment, this is similar to other study that state in general, inpatient care for otitis media with effusion (OME) is not required unless complications that threaten the stability of

the patient's condition are suspected. Even surgical intervention with pressure equalization tubes (PETs) and adenoidec-tomy is typically completed in ambulatory surgery settings.¹⁴ In current study most of babies with bilateral OM effusion have recurrent of effusion, these similar to study stated that 5.3% of 184 infants had otitis media with bilateral effusion and it is recurrent in nature.¹⁵

Conclusion

In current study males' babies are more have OM with effusion. And most age group that have OM is 6–10 years old, most OM with effusion occur bilaterally and associated with rhinitis. There is association between site of effusion and snoring, medical treatment, surgical procedure and recurrent of effusion.

Conflicts of Interest

None. ■

References

- Rosenfeld RM, Shin JJ, Schwartz SR, Coggins R, Gagnon L, Hackell JM, et al. Clinical Practice Guideline. Otolaryngol - Head Neck Surg (United States) [Internet]. 2016 Feb 1 [cited 2022 Apr 20];154:S1–41. Available from: <https://journals.sagepub.com/doi/10.1177/0194599815623467>
- Diagnosis, Natural History, and Late Effects of Otitis Media with Effusion: Summary - AHRQ Evidence Report Summaries - NCBI Bookshelf [Internet]. [cited 2022 Apr 20]. Available from: <https://www.ncbi.nlm.nih.gov/books/NBK11875/>
- Chee J, Pang KW, Yong JM, Ho RCM, Ngo R. Topical versus oral antibiotics, with or without corticosteroids, in the treatment of tympanostomy tube otorrhea. *Int J Pediatr Otorhinolaryngol* [Internet]. 2016 [cited 2022 Apr 20];86:183–8. Available from: <https://pubmed.ncbi.nlm.nih.gov/27260604/>
- Mesolella M, Iorio B, Ricciardiello F, Motta G. Efficacy of crenotherapy by Politzer in the treatment of otitis media with effusion in children with down syndrome. *Int J Pediatr Otorhinolaryngol* [Internet]. 2020 Mar 1 [cited 2022 Apr 20];130. Available from: <https://pubmed.ncbi.nlm.nih.gov/31794904/>
- van Ingen G, le Clercq CMP, Touw CE, Duijts L, Moll HA, Jaddoe VVW, et al. Environmental determinants associated with acute otitis media in children: a longitudinal study. *Pediatr Res* [Internet]. 2020 Jan 1 [cited 2022 Apr 20];87(1):163–8. Available from: <https://pubmed.ncbi.nlm.nih.gov/31421634/>
- Chen P, Wang Z nan, Xu Z qiang, Wei Y hua, Yao S fang, Peng A na, et al. Risk Factors of Otitis Media with Effusion in Children. *Int J Otolaryngol Head & Neck Surg* [Internet]. 2015 Jul 3 [cited 2022 Apr 20];4(4):303–8. Available from: http://www.scirp.org/Html/7-2460317_58330.htm
- Mark A, Matharu V, Dowsnell G, Smith M. The point prevalence of otitis media with effusion in secondary school children in Pokhara, Nepal: a cross-sectional study. *Int J Pediatr Otorhinolaryngol* [Internet]. 2013 Sep [cited 2022 Apr 20];77(9):1523–9. Available from: <https://pubmed.ncbi.nlm.nih.gov/23899700/>
- Rosenfeld RM, Culpepper L, Doyle KJ, Grundfast KM, Hoberman A, Kenna MA, et al. Clinical practice guideline: Otitis media with effusion. *Otolaryngol- Head Neck Surg*. 2004;130(5 SUPPL):S95.
- Nwosu C, da Lilly-Tariah O, Obukowho Onotai L. *Glob J Otolaryngol Prevalence of Otitis Media with Effusion among Preschool Children in Port Harcourt, Nigeria*. *Glob J Otolaryngol*. 2017;4(4).
- Hoffman HJ, Daly KA, Bainbridge KE, Casselbrant ML, Home P, Kvestad E, et al. Panel 1: Epidemiology, natural history, and risk factors. *Otolaryngol Head Neck Surg* [Internet]. 2013 Apr [cited 2022 Apr 20];148(4 Suppl). Available from: <https://pubmed.ncbi.nlm.nih.gov/23536527/>
- Walker RE, Bartley J, Flint D, Thompson JMD, Mitchell EA. Determinants of chronic otitis media with effusion in preschool children: a case-control study. *BMC Pediatr* [Internet]. 2017 Jan 6 [cited 2022 Apr 20];17(1). Available from: <https://pubmed.ncbi.nlm.nih.gov/2717332/>
- Upadhyaya I, Datar J. Treatment Options in Otitis Media with Effusion. *Indian J Otolaryngol Head Neck Surg* [Internet]. 2014 [cited 2022 Apr 20];66 (Suppl 1):191. Available from: <https://pubmed.ncbi.nlm.nih.gov/2518321/>
- Gozal D, Kheirandish-Gozal L, Capdevila OS, Dayyat E, Kheirandish E. Prevalence of Recurrent Otitis Media in Habitually Snoring School-Aged Children. *Sleep Med* [Internet]. 2008 Jul [cited 2022 Apr 20];9(5):549. Available from: <https://pubmed.ncbi.nlm.nih.gov/182527176/>
- Roditi RE, Liu CC, Bellmunt AM, Rosenfeld RM, Shin JJ. Oral Antibiotic Use for Otitis Media with Effusion: Ongoing Opportunities for Quality Improvement. *Otolaryngol - Head Neck Surg (United States)*. 2016 May 1;154(5):797–803.
- Di Francesco RC, Barros VB, Ramos R. Otitis média com efusão em crianças menores de um ano. *Rev Paul Pediatr* [Internet]. 2016 Jun 1 [cited 2022 Apr 21];34(2):148–53. Available from: <https://pubmed.ncbi.nlm.nih.gov/2717264/>

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