

# 소아 중이염의 진단과 치료

정 명 현 · 조 성 우

## Diagnosis and Treatment of Otitis Media in Children

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삼출성중이염(Otitis media with effusion) (COME) (risk factor) Table 1 , 가

가 , 원 인

23 40 , 2/3 가

3 80 90% 가 ,

(spontaneous resolution) theory ex vacuo

(Chronic Otitis Media with Effu - sion ; COME) , , (tensor veli palat - ini muscle) (barotrauma) , ,

가 , 가

가 , 가

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: , 135 - 720

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E - mail : YDENT@YUMC.YONSEI.ac.kr 가 S. pneumoniae, H. influenzae,

M. catarrhalis, group A streptococcus, S. aureus, G(-) enteric bacilli (Table 2 and 3). 6 G(-) bacilli가 20% 2)

3) bac- teroides sp, peptococcus sp, peptostreptococcus sp, propionibacterium sp.

rhi- novirus, adenovirus, influenza virus, parainfluenza virus, respiratory syncytial virus

4) 0 10% 가 S. pneumoniae, H. influenzae, M. catarrhalis

**Table 1.** Risk factors for chronic otitis media with effusion

Host	Environment	Disease
Male	Bottle-feeding	Bilateral middle ear effusion
Age < 2 years	Passive smoke exposure	
Anatomical defect	Group day-care	
Cleft palate		
Down syndrome		
History of acute otitis media	Season Winter > Summer	

5) 80% 가 Fig. 1

**Table 2.** Distribution of bacteria (AOM) in 2,807 ears from the Pittsburgh Otitis Research Center, 1980 to 1989

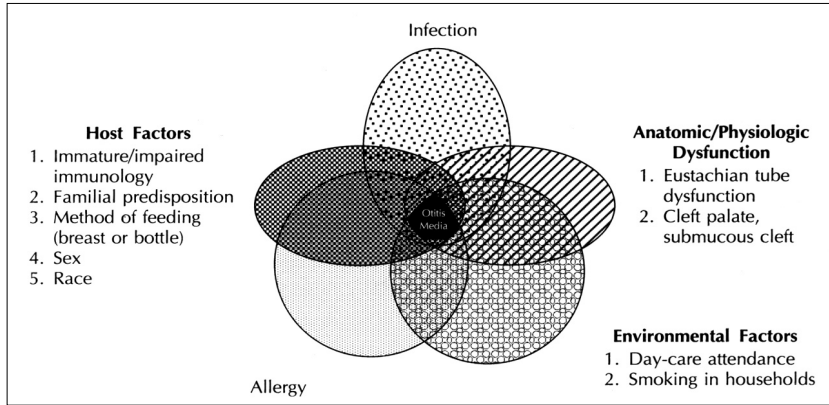
Cultured bacteria	Percentage
S. pneumonia	18%
H. influenza	18%
M. catarrhalis	11%
-streptococcus	3%
Group A streptococcus	2%
S. aureus	2%
P. aeruginosa	2%
Other Bacteria	39%
No Growth	25%

6) 가 1/3 가

**Table 3.** Percentage of bacteria from MEE from children with COME from united states, finland, and Japan

	United states (n=4,483 ears)		Finland (n=510 ears)	Japan (n=441 ears)
	1980 - 1985	1978 - 1984	1984	1984
Haemophilus influenzae	14.7	8.0	20.2	
Streptococcus pneumoniae	7.0	4.3	10.6	
Branhamella catarrhalis	8.5	3.5	2.3	
Streptococcus pyogenes	0.8	0.2	0.9	
Staphylococcus epidermidis	-	-	-	
Others	35.3	5.3	4.8	
No growth	34.0	66.3	56.0	

From Bluestone CD and others : Ann Otol Rhinol Laryngol 1990 ; 99 : 43



**Fig. 1.** Factors involved in the etiology and pathogenesis of otitis media. (From Bluestone CD, Klein JO. Otitis media, atelectasis, and eustachian tube dysfunction. In : Bluestone CD, Stool SE, Kenna MA eds. Pediatric otolaryngology, 3rd ed. Philadelphia : WB Saunders, 1996 : 388).

병 리 (Infection)

가 (Allergy)

증 상 (Anatomic/Physiologic Dysfunction)

가 (Environmental Factors)

lumnar metaplasia가 (gland tissue) 가

가 (glue) 가 (fluid level)

(transudation) (exsudation) (amber color)

(dirty gray) (blue drum)

가 (cholesterol granuloma)

(retrac - 가

진 단 (Middle Ear Effusion ; MEE)가 67%

glycoprotein IgA가

TV 가 TV volume 가 , , . pneumatic otoscope 가 10 40dB admittance가 tympanogram type B 가 C , . Pneu- matic otoscopy 1 85% (sensitivity ; ) 75% (specificity ; ) 7) tympano- metry 가 90% 8) MicroTymp hand - held tym- panometer(Welch Allyn, Skaneateles Falls, NY) , 60% 9)10) acoustic otoscope(ENT Medical Devices, Wareham, MA) portable chart recorder reflectivity angle 90% , 11) re- corder 가 60% 50% (aco- ustic reflex stapdial reflex) tympanogram 가 . Fig. 2 tympanogram type 가 (craniofacial anomaly)

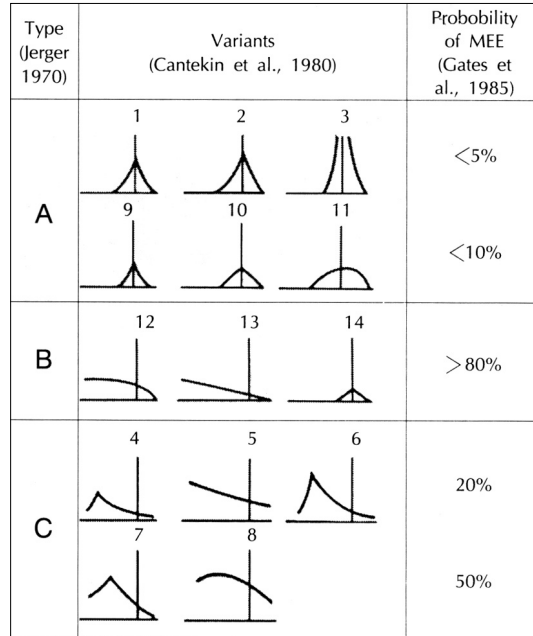


Fig. 2. Tympanometric patterns in otitis media.

hypona- sality 치료 Table 4 12 4 3 ) Ta- ble 5 amoxicillin sulfisoxazole, am- picillin, 13)14) Trimethoprim - sulfamethoxazole(TMP - SMX) 15) 2

**Table 4.** Primary control of otitis media with effusion

Contributing Factor	Intervention
Passive smoking	Reduction or elimination of exposure Better ventilation
Inhalant allergies	Environment measures Immunotherapy
Food allergies	Dietary modification Soy-based or elemental formulas
Recurrent acute otitis media	Antibiotic prophylaxis Adenoidectomy
Viral URI	Frequent hand-washing Extra layer of clothing in winter
Group daycare	Alternative care situations
Eustachian tube dysfunction	Patience ; improve with growth and development
Immature immune system	Patience ; improve with growth and development

3

11

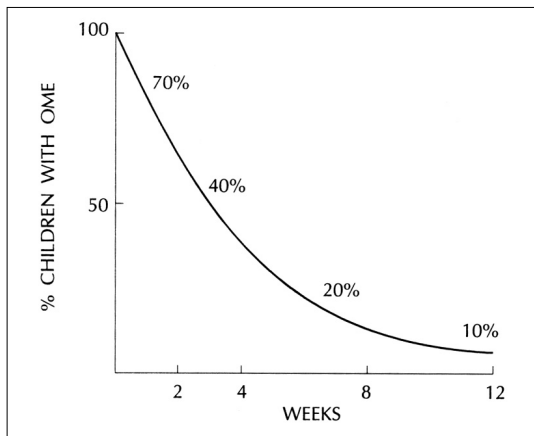
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1994 Agency for Health Care Policy and Res -

**Table 5.** Recommendation for the medical management of OME

Agent (S)	Comments	Pediatric Dose	Dosage	-lactamase
Prophylactic antibiotics				
Amoxicillin (Amoxil)	Requires refrigeration, every 2 weeks	20 mg/kg/d	Daily	None
Sulfisoxazole (Gantrisin)		50 - 75 mg/kg/d	Daily	Good
1st-line antibiotic therapy				
Amoxicillin (Amoxil)	If penicillin tolerant	40 mg/kg/d	8 h	None
TMP-SMX (Bactrim ; Septra)	If penicillin allergic	1 tsp each 10 lb	12 h	Good
2nd-line antibiotic therapy				
Amoxicillin-clavulanate (Augmentin)	15 - 20% GI upset	40 mg/kg/d based on AMX	8 h	Excellent
Cefaclor (Ceclor)	Serum sickness	40 mg/kg/d	8 - 2 h	Fair
Cefprozil (Cefzil)		15 mg/kg/d	12 h	Good
Cefixime (Suprax)	20 - 30% GI upset	8 mg/kg/d	Daily	Excellent
Cefpodoxime (Vantin)	Well tolerated	10 mg/kg/d	12 h	Excellent
Broad spectrum				
EM-sulfisoxazole (Pediazole)	Inconvenient dosage schedule	50 mg/kg/d	6 h	Good
Loracarbef (Lorabid)	Give 1 hour before or 2 hours after meals	30 mg/kg/d	12 h	Good
Oral steroids				
Prednisolone (Pediapred, Prelone)	Together with antibiotic	1 mg/kg/d X 5 d ; 1/2 mg/kg/d X 5	Daily	-
Prednisone (Luquid Pred)	Together with antibiotic	Same as Prednisolone	Daily	-

TMP-SMX = Trimethoprim-sulfamethoxazole AMX = Amoxicillin EM = Erythromycin



**Fig. 3.** Duration of effusion after first episode of AOM (Adapted from Teele DW, Klein JO, Rosner BA. Epidemiology of otitis media in children. Ann Otol Rhinol Laryngol 1980 ; 89 Suppl 68 : 5).

**Table 6.** Factors favoring surgical treatment of OME

Bilateral disease
Bilateral hearing loss
Speech delay
Behavior problems
Structural changes in the tympanic membrane
Antibiotic allergy
High-risk for recurrent acute otitis media

earch(AHCPR)

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Ta-

ble 1

가

가 6

AHCPR

(Fig. 4)

25.1%

가 ,

6 , 9 , 12

1

60%

, 2

80%

3

10

, 3  
(Fig. 3).<sup>18)</sup>

90%

60%

가

가

가

24%

S. pneu -

12%

moniae H. influenzae

가

(reservoir)

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가

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. 6

10

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(

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20 dB

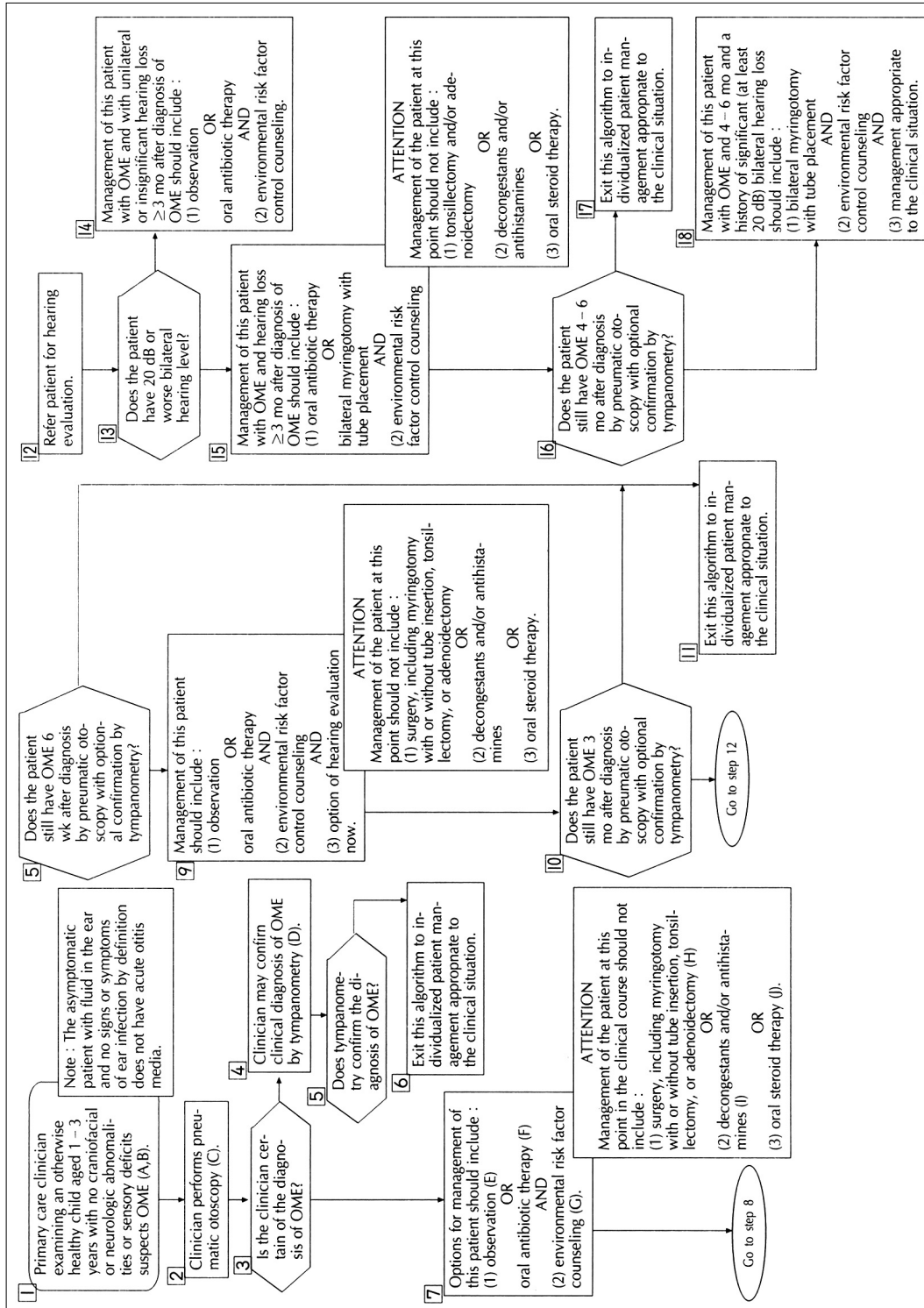


Fig. 4. Algorithm for managing otitis media with effusion in an otherwise healthy child aged 1 – 3 years old.

가 .

catheterization , Politzer  
 Politzer , 가 가  
 Valsalva 가  
 Catheterization cannulation

amoxicillin, erythromycin, erythromycin/sulfis -  
 oxazole, trimethoprim/sulfamethoxazole, sulfisi -  
 xazole, cefaclor, amoxicillin/clavulanate  
 -lactamase H. inf -  
 luenza M. catarrhalis,  
 (penicillin - resistant S. pneumonia ; PRSP) 가  
 가 2 3  
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 가 , amoxicillin  
 amoxicillin 1 가  
 . Amoxicillin  
 60 80 mg/kg/day 가  
 4 amoxicillin  
 가 amoxicillin/clavulanate , 2 6  
 3 (cephalosporin)  
 -lactamase stable agent 가  
 10  
 가 가 (deconges - ption)  
 tant) 1% ephedrine 0.25% neosynephrine  
 ephedrine

. 1990 Paradise



35%<sup>19)</sup> 가 ,

급성과 아급성 삼출성중이염의 치료

(3 )

(3 )

2 60%가 , (NSAID) (pl-  
acebo) 가 가

80% 가 , 80%<sup>20)21)</sup> , 가

60% 1 , 80% 가 .

2 , 3 90% 가

가 , 2 (routine)<sup>22)</sup>

(3 12 ) 가

가

Table 7 ,  
1992 Ros - , Table 8  
enfeld , Table 8  
(placebo) (structural changes of tympanic me-  
23% mbrane) (atrophy), (atelecta-  
32% sis), retraction pocket  
H. influenza, S. pneumoniae, M. cat-  
arrhalis가 . 1 , ,

**Table 7.** Management options for acute and subacute OME

Intervention	Comment
Watchful waiting	Higher than 80% rate of spontaneous resolution
Therapeutic antibiotic	If none in past 4 weeks
Prophylactic antibiotic	If 3 or more AOM episodes in 6 months, or 4 or more in 12 months
Nonsteroidal anti-inflammatory agents	Ineffective
Antihistamines, decongestants	Ineffective
Oral steroids	Not recommended
Surgery	Not recommended

**Table 8.** Considerations in management in OME

Factor	Favors Surgery	Favors Alternatives to Surgery
Epidemiology		
Laterality of OME	Bilateral	Unilateral
Age of child	2 years or younger	Older than 2 years
History of AOM	"Otitis prone"	Infrequent episodes
Daytime environment	Group daycare	Home care
Passive smoke	Frequent smoke exposure	No smoke exposure
Current season	Fall or early winter	Spring or early summer
Impact on child		
Hearing	Bilateral hearing loss	Normal hearing
Speech and language	Speech delay or misarticulation	No speech impairment
Behavioral	Abnormal behavior	Normal behavior
Miscellaneous		
Otoscopic appearance	Structural changes of tympanic membrane	Air bubbles or air-fluid level
Antibiotic tolerance	Multiple drug allergies	Antibiotics well tolerated
Baseline risk for otitis media	High-risk population	Normal risk
Other indication for surgery on pharynx or ears	Present	Absent

(erosion)

3 5 varicella exposure가 ,

만성 삼출성중이염의 치료 가 가 ,

23 40 , 3 90% otitis prone, 2 ,

, 10% 3 .

(3 12 ) .

가 가 ,

10 30

6 32% 가 .

가

betalactamase - stable antibiotics .

10 가 6 18 가 가

(short - acting tube)

15 20% (mucus gland) , air

. Betalactamase - st - cell system .

able antibiotics prednisone pre - 가 .

dnisolone 1 mg/kg/day 5 가 .

**Table 9.** Management options for chronic otitis media with effusion

Intervention	Comment
Watchful waiting	Rate of spontaneous resolution is 20%
Therapeutic antibiotic	If none in past 4 weeks ; use -lactamase stable drug
Prophylactic antibiotic	Limited data on chronic OME ; may be effective
Autoinflation	Inconsistent results ; may be effective
Oral steroids	Consider prior to surgical intervention Possible exacerbation of varicella
Myringotomy	Ineffective alone May be combined with adenoidectomy
Tympanostomy tubes	Short-acting tubes are preferred No carry-over effect
Adenoidectomy	Significant carry-over effect See text for patient selection guidelines
Tonsillectomy	Ineffective

47%

가

가

합병증

, cholesterol granuloma,

중심 단어 :

가

Table 9

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6  
1  
(long - acting tube)  
50%  
4  
2  
가  
가  
1988 Gates  
29%,  
38%,

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