

## Group A-beta Hemolytic Streptococci Cefprozil

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= Abstract =

### Clinical and Bacteriologic Efficacy of Cefprozil on Pharyngitis and Pharyngotonsillitis caused by Group A Beta Hemolytic Streptococci in Children

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**Objective :** To determine the clinical and bacteriologic efficacy and safety of Cefprozil in acute pharyngitis and pharyngotonsillitis caused by Group A beta hemolytic streptococci in pediatric patients.

**Methods :** Any patient of 3 to 14 age who visited the hospitals enrolled in this study with the signs and symptoms of pharyngitis or pharyngotonsillitis since July, 2000 to March, 2001, was taken throat culture and given Cefprozil (15 mg/kg/day, in two divided doses) for 10 days. 138 patients of whom showed positive culture results were followed up for the signs and symptoms during the treatment to determine clinical efficacy. Any undesirable effect was reported to determine the safety of the drug. Follow up cultures were done at the end of the study and bacteriologic efficacy was determined.

**Results :** 138 of 256 patients who visited the hospitals with the signs and symptoms of pharyngitis or pharyngotonsillitis showed positive growth on throat culture. Mean age of the

patients was  $6.1 \pm 2.5$  and males and females were equally numbered. 129 of them complained fever on the first visit and 112(86.6%) of them were improved at the end of the study. Cervical lymphadenitis was seen in 58 patients and 44(75.9%) of them improved at the end of the study. Exudative pharyngitis was seen in 96 patients and 81(84.3%) of them improved. The overall clinical efficacy based on this results showed that 110(79.7%) of the patients were cured and 17(12.3%) of them improved. On the cultures and bacteriologic efficacy, 24.6% of them showed documented eradication after treatment and 62.3% of them showed presumptive eradication. Sensitivity test was done by agar dilution method and Cefprozil showed 100% sensitivity. Erythromycin, Clarithromycin and azithromycin showed 87%, 85.6 %, 90.6% sensitivity, respectively.

**Conclusion :** Cefprozil is proved to be effective in controlling group A streptococcal pharyngitis and pharyngotonsillitis in children and showed good sensitivity. Cefprozil can be used as an effective oral cephalosporin in the patients showing penicillin hypersensitivity or patients who other drugs have failed.

**Key Words :** *Streptococcus pyogenes*, Pharyngitis, Tonsillitis, Treatment

가 1 1 2 가 <sup>4)</sup>.  
1991  
1995  
4 7 ,  
5% ,  
가 .  
A *Streptococcus pyogenes*가 .  
1 .  
cillin 10 , peni- 2000 7 2001 3 ,  
가 <sup>1)</sup> penicillin , ,  
macrolide cephalosporin ,  
<sup>2, 3)</sup> Cefprozil 2 3 15  
cephalosporin cephalosporin 138 ( 69 , 69 ,  
 $6.1 \pm 2.5$ ) .  
beta-lactamase . 1) 2

long-acting penicillin 가 .  
 , 2)  
 , 3) , 4) cephalosporin 4 . 가  
 penicillin 1)  
 , 5) , 6)  
 가 , 가 , .  
 7) , (Cure) :  
 가  
 가 , , (Improvement) :  
 가  
 , 가  
 , , (Failure) :  
 가 , , 가  
 37 , (Unable to determine) : 가  
 Streptotex(Murex Diagnostic Limited, England) 5  
 , cefprozil 15  
 mg/kg/day 2 10 가  
 5 7 10 14 2) 가  
 가  
 agar dilution method 가 ,  
 , (Documented Eradication) :  
 , ,  
 가 (Presumptive Eradication) :  
 가 “  
 ” “ ” 가 , , (Do-  
 cumented Persistence) :  
 가 , , (Presump-  
 tive Persistence) :  
 “ ” 가  
 , , 가 (Unable To determine) : 가  
 5  
 , 가  
 .  
 5 .  
 . 1)  
 Group A beta hemolytic streptococcus(  
 GABHS )가 , 2)  
 GABHS가  
 , 3) , 4)  
 가 , ,  
 , 5) , .

1. (Table 1) 10  
가  
가 1  
2. (Table 2)  
6.1±2.5 69  
69  
3. (Table 3)  
1  
5  
4. GABHS  
138 GABHS가 256  
38  
4 GABHS가  
5. 가 (Table 4)  
138 127 (92%)가  
가

Table 1. Patients That Left Study before 10 Day Course of Treatmet

Causes	Patient number
Unwanted reaction	1
Follow up loss	21
E.t.c	1
Total	23

6. (Table 5) 가

138 120 가  
. 4  
가

7. GABHS Cefprozil  
(Table 6)

Cefprozil GABHS  
100% sensitive . Erythromy-  
cin, clarithromycin, azithromycin macrolide  
13%, 15.9%, 9.4%

Table 2. Demographics

Sex number	
Male(%)	69(50.0)
Femal(%)	69(50.0)
Age	
Mean(SD)	6.1(2.5)
Range	3.0 14.0
Weight(kg)	
Mean(SD)	24.1(9.2)
Range	11.0 63.0
Diagnosis(%)	
Phayngitis	30(21.7)
Tonsilitis	47(34.1)
Pharyngotonsilitis	61(44.2)
Previous antibiotic use number(Percentage)	
Yes	6( 4.3)
No	132(95.7)
Physical examination	
Noraml(%)	13( 0.7)
Abnormal(%)	125(90.6)
Abnormal findings on physical xamination	
General appearance	32(23.2)
Head, Eyes, ENT	122(88.4)
Chest	0( 0.0)
Abdomen	1( 0.7)
Extremities	1( 0.7)
Skin	38(33.3)
Others	3( 2.2)

Table 3. Improvement of Clinical Symptom

Signs and symptoms before treatment(n=138)		Visit2(n=120)	Visit3(n=75)
Fever; 129(93.5%)	Cured	104/112(92.8%)	65/70(92.9%)
	Improved	8/112(7.1%)	1/70(1.4%)
Cervical lymphadenopathy; 58(42.0%)	Cured	10/47(21.3%)	19/32(59.3%)
	Improved	34/47(72.3%)	12/32(37.5%)
Exudative pharyngitis; 96(70.0%)	Cured	31/82(37.8%)	46/50(92.0%)
	Improved	50/82(61.0%)	3/50(6.0%)

Table 4. Efficacy Determined by Clinical Improvement

Clinical efficacy	Number of patient(n=138)
Cured	110(79.7%)
Improved	17(12.3%)
Failed	0(0.0%)
Undetermined	11(8.0%)

Table 5. Efficacy Determined by Bacteriologic Response

Bacteriologic efficacy	Number of patient(n=138)
Eradication	34(24.6%)
Presumptive eradication	86(62.3%)
Failure	4(2.9%)
Presumptive failure	2(1.5%)
Undetermined	12(8.7%)

8. (Table 7)

8

2

1 가

cephalosporin

dine, Cefadroxil

Cefaclor, Cefprozil

Cephalexin

MRSA

Cephalexin

Cephadrine

Spneumonia

가

H.influenzae

Cefadroxil

Cephadrine

가

가

가

3 4

2 cephalosporin

Cefaclor

1995

Cefprozil

porin

가

가

0.9 1.2

250 mg

(Cmax)

6.2

94%

60%가

42%

1.2 1.4

가 0.6 0.9

cefaclor

가

cefaclor

가

가

, GFR 30

50%

mL/min

Cefprozil

Cefaclor, Cefuroxime, Amoxicillin/Clavulanate

5 9)

가

H.influenzae

Table 6. Sensitivity Test to GABHS

Response/med	EM	AZM	CTM	CLM	TC	VAN	CTRX	CPRZ	CHP	AMXC
Sensitive.	19	38	116	21	64	138	134	138	130	61
Intermed.	101	78	9	98	44	0	4	0	8	77
Resistant.	18	22	13	19	30	0	0	0	0	0
S%	13.8	27.5	84.1	15.2	46.4	100	97.1	100	94.2	44.2
I%	73.2	56.5	6.5	71	31.9	0	2.9	0	5.8	55.8
R%	13.0	15.9	9.4	13.8	21.7	0	0	0	0	0

EM : Erythromycin, AZM : Azithromycin, CTM : Clarithromycin, CLM : Clindamycin, TC : tetracyclin, VAN : Vancomycin, CTRX : Ceftriaxome, CPRZ : Cefprozil, CHP : Chloramphenicol, AMXC : Amoxicillin

Table 7. Undesired Events

Undesired events	Number	Relation to medication	Number	Severity	Number
Skin rash	2	May be indirectly related	1	Mild	1
				Moderate	1
Abdominal pain	2	May be indirectly related	2	Mild	2
Diarrhea	4	May be indirectly related	1	Mild	3
		Strong possibility exists	2		
		Clearly related	1	Moderate	1

*enzae, K.pneumonia, M.catarrhalis* 0.3%, 0.1%, 0.1%가  
<sup>10)</sup> *Spyogens* Cef-McCarty 864  
 prozil , Cefprozil Cefprozil <sup>7)</sup> 3.6%,  
*Spyogens* 100% 2.4%, 2.1%, 1.7%, 1.2%,  
 , macrolide 0.9%  
 Erythromycin Clarithromycin, Azithromycin 가  
 13%, 15.9%, 9.4%  
 Cefprozil Amoxicillin 가 가  
 55%  
 intermediate sensitivity가  
 4 (2.9%)  
<sup>11)</sup> 8.7% sistant group A streptococci가 15 40% EM-re-가  
 , macrolide  
 가  
 가 , ,  
 가 가  
 가 Cefprozil

- 1) Pichichero ME. Controversies in the treatment of streptococcal pharyngitis. *Fam Physician* 1990;42:1567-76
- 2) Pichichero ME, Margolis PA. A comparison of cephalosporins and penicillins in the treatment of group A beta-hemolytic streptococcal pharyngitis: a meta-analysis supporting the concept of microbial copathogenicity. *Pediatr Infect Dis J* 1991;10:275-81
- 3) Pichichero ME. Cephalosporins are superior to penicillin for the treatment of streptococcal tonsillopharyngitis is the difference worth it? *Pediatr Infect Dis J* 1993;12:268-74.
- 4) Wise R. Cefprozil :comparative microbiology and pharmacokinetics. Symposium :cefprozil, clinical experience with a new oral cephalosporin. The 6th international congress for infectious disease. Prague, Czech republic, 1994.
- 5) Kafetzis D. Multi-investigator evaluation of efficacy and safety of cefprozil, amoxycillin/clavulanate, cefixime and cefaclor in the treatment of acute otitis media. Symposium :cefprozil, clinical experience with a new oral cephalosporin. The 6th international congress for infectious diseases. Prague, Czech republic, 1994.
- 6) Wilber RB, Hamilton H, Leroy A. Cefprozil multicenter study group :cefprozil vs cefaclor in the treatment of lower respiratory tract infection. *Infections in Medicine*,1992;9:S33-9
- 7) McCarty JM, Renteria A, Doyle CA. Cefprozil multicenter study group: cefprozil vs cefaclor in the treatment of pharyngitis and tonsillitis. *Infections in medicine*, suppliment 1992;9:66-7.
- 8) Ball P. Oral cefprozil versus cefaclor, cefuroxime axetil and amoxycillin/clavulanate in acute bronchitis, acute exacerbations of chronic bronchitis and bacterial pneumonia. Symposium : cefprozil clinical experience with a new oral cephalosporin. The 6th international congress for infectious diseases. Prague, Czech republic, 1994.
- 9) Aronovitz GH, Doyle CA, Durham SJ. Cefprozil multicenter study group :cefprozil vs amoxycillin/clavuanate in the treatment of acute otitis media. *Infections in Medicine* 1992;9:S40-7.
- 10) Kaiser L, Lew D, Hirschel B, et al. Effects of antibiotic treatment in the sunset of common cold patients who have bacteria in nasopharyngeal secretions. *Lancet* 1996;347:1507-10.
- 11) D. Milatovic, D. Adam, H. Hamilton and E. Materman. Cefprozil versus Penicillin V treatment of Streptococcal tonsillopharyngitis. *Antimicrobial Agents and Chemotherapy* 1993: 1620-3.