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= Abstract =

A Clinical Study of Hospitalized Infants 28 to 90 Days of  
Age with Fever without Source

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**Purpose :** The purpose of this study was to investigate clinical features of hospitalized infants 28 90 days of age with fever without source and to analyze those of young febrile infants using risk criteria for serious bacterial infection.

**Methods :** The clinical features of 131 infants 28 90 days of age admitted to the Ulsan Dong-Kang General Hospital Pediatric Department because of fever(temperature 38 rectally) without source, from January 2000 to December 2000, were investigated by retrospective chart review. The clinical features of 131 febrile infants were analyzed using Rochester criteria.

**Results :** Among 131 cases, there were 60 cases(45.8%) of urinary tract infection, 33 cases (25.2%) of aseptic meningitis, 2 cases(1.5%) of bacteremia and 36 cases(27.5%) of no specific diagnosis. Among 131 cases, there were 57 cases(43.5%) in low risk group and 74 cases(56.5%) in not low risk one by Rochester criteria. A significant difference in the incidence of urinary tract infection, aseptic meningitis and no specific diagnosis was not found between both groups. Male to female ratio was 1.8 : 1. Sex ratio between both groups was not significantly different. Most febrile infant were noted in spring(35.1%) and the summer (36.7%). The peak incidence of aseptic meningitis was noted in May and June. The fever subsided mostly within 48 72 hours after administering antimicrobial agents(61.8 83.2%). A significant difference in duration of fever after administering antimicrobial agents was not found between both groups.

**Conclusion :** A selected group of low risk infants 28 90 days of age with fever without source can be managed as outpatients provided that a thorough initial evaluation is performed, that parents can reliably monitor their infant closely at home and that careful follow

up can be assured. Because bag collected specimens were more likely to yield indeterminate urine culture result, a suprapubic or catheter obtained urine specimen for culture is a necessary part of the evaluation of all febrile infants 28-90 days of age. The further prospective study on evaluation and management of young febrile infant should be performed in our hospital.

**Key Words :** Young febrile infant, Clinical feature, Low risk

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131

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Rochester criteria<sup>7, 10)</sup>(Table 1)

1),

2, 3)

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4-6)

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7-11)

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Table 1. The Rochester Criteria

Infant appears generally well
Infant has been previously healthy
Born at term( $\geq 37$ weeks gestation)
Did not receive perinatal antimicrobial therapy
Was not treated for unexplained hyperbilirubinemia
Had not received and was not receiving antimicrobial agents
Had not been previously hospitalized
Had no chronic or underlying illness
Was not hospitalized longer than mother
No evidence of skin, soft tissue, bone, joint, or ear infection
Laboratory values:
Peripheral blood WBC count 5.0 to $15.0 \times 10^9$ cells/L(5,000 to 15,000/mm <sup>3</sup> )
Absolute band form count $\leq 1.5 \times 10^9$ cells/L ( $\leq 1,500$ /mm <sup>3</sup> )
$\leq 10$ WBC per high power field( $\times 40$ ) on microscopic examination of a spun urine sediment
$\leq 5$ WBC per high power field( $\times 40$ ) on microscopic examination of a stool smear (only for infants with diarrhea)

, , 2 (1.5%),  
가 17 가 36 (27.5%) . 2  
114  
가 10/mm<sup>3</sup> 가

*Staphylococcus aureus* (Table 2).

## 2. Rochester criteria

131 Rochester criteria  
가 57 (43.5%),  
가 74 (56.5%)  
25 (43.8%), 16  
가 16  
(28.1%),  
(28.1%)  
Coagulase negative staphylococcus가 2 35 (47.3%), 17 (23.0  
, %, 가 20 (27.0  
, 2 (2.7%)  
Chi-square test .

가 Rochester cri-  
teria가  
(Table 3).

1.

131 60 (45.8  
) 가 , 33 (25.2%),

3.

85 , 46  
가 1.8 : 1 가  
가 3 : 1, 2 : 1  
2

Table 2. Final Diagnosis for 131 Infants 28 to 90 Days of Age with Fever without Source

Diagnosis	No. of patients(%)
Urinary tract infection	60( 45.8)
Aseptic meningitis	33( 25.2)
Bacteremia	2( 1.5) <sup>*</sup>
No specific diagnosis	36( 27.5)
Total	131(100.0)

<sup>\*</sup>2 patients have *staphylococcus aureus* bacteremia

가 . Rochester criteria  
1.9 : 1, 1.8 : 1  
(Table 4).

4.

46 (35.1%), 48 (36.7%)  
, 29 (22.1%) 가 8 (6.1%)

Table 3. Final Diagnosis by Risk Group

Diagnosis	Low risk group(n=57) n(%)	Not low risk group(n=74) n(%)	Total(n=131) n(%)
Urinary tract infection	25(43.8)	35(47.3)	60(45.8)
Aseptic meningitis	16(28.1)	17(23.0)	33(25.2)
Bacteremia		2( 2.7)	2( 1.5)
No specific diagnosis	16(28.1)	20(27.0)	36(27.5)

Table 4. Sex Distribution by Risk Group and Diagnosis

Diagnosis	Low risk group		Not low risk group		Total	
	Male	Female	Male	Female	Male	Female
Urinary tract infection	19	6	26	9	45	15
Aseptic meningitis	10	6	12	5	22	11
Bacteremia				2		2
No specific diagnosis	8	8	10	10	18	18
Total	37	20	48	26	85	46

Table 5. Seasonal Distribution of Patients

Season	No. of patients with UTI(%)	No. of patients with AM(%)	No. of patients with no specific DX(%)	No. of patients with bacteremia(%)	Total(%)
Spring	17( 28.4)	16( 48.5) <sup>*</sup>	11( 30.6)	2( 100.0)	46( 35.1)
Summer	24( 40.0)	13( 39.4) <sup>†</sup>	11( 30.6)		48( 36.7)
Fall	5( 8.3)	0( 0.0)	3( 8.2)		8( 6.1)
Winter	14( 23.3)	4( 12.1)	11( 30.6)		29( 22.1)
Total	60(100.0)	33(100.0)	36( 100.0)	2( 100.0)	131( 100.0)

<sup>\*</sup> 12 cases in May, <sup>†</sup> 12 cases in June, UTI :urinary tract infection, AM : aseptic meningitis, DX : diagnosis

Table 6. Duration of Fever after Adminis-  
tering Antimicrobial Agents by Risk  
Group

Duration (hours)	Low risk group(n=57) n(%)	Not low risk group(n=74) n(%)	Total (n=131) n(%)
<24	18(31.6)	21(28.4)	39(29.8)
24-48	13(22.8)	29(39.2)	42(32.0)
48-72	14(24.5)	14(18.9)	28(21.4)
>72	12(21.1)	10(13.5)	22(16.8)

. 16 (48.5%), 13  
(39.4%), 4 (12.1%),  
12 5 , 13  
12 6 5 , 6  
(Table 5).

5 .

가 29.8%, 48  
가 83.2% 72

, Rochester criteria

48 가 54.4%,  
67.6%, 72 가 78.9%, 86.5%  
(Table 6).

3

10 15%, 5%

가 1983 DeAnglis 5) 2

, 21% , 32%  
가 47% 가

, 2% . 1985 Krober 12)  
3 182

가 62 (33%), 54

5 : 28 90 195

(30%), 20 (11%), , 57 (43.5%), (not low risk group)  
 , , 74 (56.5%) ,  
 131 60 (45.8%) 가 25 (43.8%), 35 (47.3%)  
 , 가 36 16 (28.1%), 17 (23.0%),  
 (27.5%), 33 (25.2%), 2 (2.7%)  
 2 (1.5%) .  
 Crain Gershel<sup>13)</sup> 8 (no specific diagnosis)가  
 442 33 (7.5%) 16 (28.1%), 20 (27.0%) ,  
<sup>14)</sup> 2 258 ,  
 16 (6.2%) 가  
<sup>15)</sup> 가 Anbar<sup>8)</sup>

가 Rochester criteria  
 (bag collec-  
 tor) 가  
 105/mL ,  
 (mid-stream)  
 (catheterization)  
 가 <sup>16, 17)</sup> .  
 3 가 98.9%,  
 가 99.5% Rochester  
 가 <sup>2, 3, 12, 18, 19)</sup> , 1985 Rochester criteria  
 Dagan<sup>7)</sup> 3 40 60%  
 3

(  
 , , ) 가 , *respiratory syn-*  
 , , *cytial virus*(RSV) A  
<sup>1)</sup> .  
 , Krober<sup>12)</sup> 182  
 가 5,000 15,000/mm<sup>3</sup> 41% 가 54  
 band form 1,500/mm<sup>3</sup> , 41  
 40 가 .  
 가 Dagan<sup>7)</sup> 144 70% ,  
 89  
 144 1 (0.7%) 41% 가  
 , 가 가  
 1 9 (10%) 7 11 가  
 RSV 12 4  
 Rochester criteria 가  
 (low risk group)

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33 . Ceftriaxone 가  
36 가  
, 25, 26)  
가 24 가 29.8%, 48 가 61.8%, 72  
가 가 83.2% 72  
5 7 가 가  
가 가  
가 20, 21)  
ceftriaxone  
1991 Baraff<sup>22)</sup>  
(nontoxic febrile children) Rochester criteria  
가  
가 28 90  
99% 4  
68  
% 8  
10.3% 12 가 가 ,  
2 3  
(well looking, “sepsis work-up” ceftriaxone 1  
nontoxic)  
, “sepsis work-up”  
18)  
2 3  
Greene ,  
4)  
9%  
:  
3  
가 가  
9 11, 23, 24)  
1988 Baskin<sup>9)</sup> 28 90 가 가  
(nontoxic .  
28 90  
“sepsis  
work-up” 2 . 1  
ceftriaxone 1

가

: 2000 1 2000 12  
( 38 ) 131

가 가 ,

가

## Rochester criteria

: 131 60  
(45.8%) 가 , 33  
(25.2%), 2 (1.5%),  
가 36 (27.5%) . 2  
*Staphylococcus aureus* . Rochester criteria  
가 57 (43.5%),  
가 74 (56.5%) ,  
43.8%, 47.3%,  
28.1%, 23.0%,  
가 28.1%, 27.0%  
가 Rochester criteria가  
. 2  
85 , 46  
가 1.8 : 1 , Rochester criteria  
1.9 :  
1, 1.8 : 1  
35.1%, 36.7%  
16 (48.5%),  
13 (39.4%), 4 (12.1%) ,  
12 5 ,  
13 12 6 5 6  
48 61.8%, 72 가  
83.2% 48 72  
, Rochester criteria  
48 가 54.4%,  
67.6%, 72 가 78.9%, 86.5%  
: 28 90

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