

: 1996 1998

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= Abstract =

## A Clinical Study of Aseptic Meningitis from 1996 to 1998

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**Purpose :** There was an epidemic of aseptic meningitis in Korea for 3 years from 1996 to 1998. In this study, we reported the time of outbreak, age and sex distribution, clinical manifestations, laboratory data, and complications of the children with aseptic meningitis.

**Methods :** We reviewed clinical records of 192 aseptic meningitis patients who had been admitted to Pohang St. Mary's Hospital from 1996 to 1998.

**Results :** Aseptic meningitis occurred most frequently in July and August. The ratio of male to female was 1.91 : 1, and the most prevalent age was 1 to 5 years of age. The main symptoms were fever, vomiting, headache in this order of frequency. Peripheral blood showed leukocytosis( $WBC > 10,000/mm^3$ ) in 44.3% of the cases. CSF examination showed WBC count were less than  $500/mm^3$  in 88.0%, protein levels less than 40 mg/dL in 61.5%, and glucose levels more than 40 mg/dL in 94.3% of the cases. We did not isolate the causative viral agents.

**Conclusion :** Aseptic meningitis was prevalent in children in the Pohang area from 1996 to 1998. Clinical manifestations and CSF profiles of aseptic meningitis patients showed no great difference compared to other reported.

**Key Words :** Aseptic meningitis, Children

1993

1996 1998

, , .

가

: , 1996 5 1998 10  
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가 4  
30/mm<sup>3</sup>, 4  
mm<sup>3</sup>가  
6/  
2.  
1996 1998  
4 (2.0%)  
3.8  
(Table 3).  
1.  
3  
192  
1996 5 2 (2.7%), 6  
5 (6.7%), 7 1 (1.3%), 8 56 (75.7  
(%), 9 9 (12.2%), 10 1 (1.3%)  
1997 7 24 (34.2%), 8 20 (30.1  
(%), 9 17 (23.2%), 10 7 (9.6%), 11  
2 (2.7%), 1998 5 3 (6.7%),  
6 7 (15.5%), 7 27 (60.0%), 8 4  
(8.9%), 9 3 (6.7%), 10 1 (2.2%)  
1996 8, 1997 7·8, 1998  
7가 (Fig. 1).  
126 (65.6%), 66  
(34.4%) 1.91 : 1가.

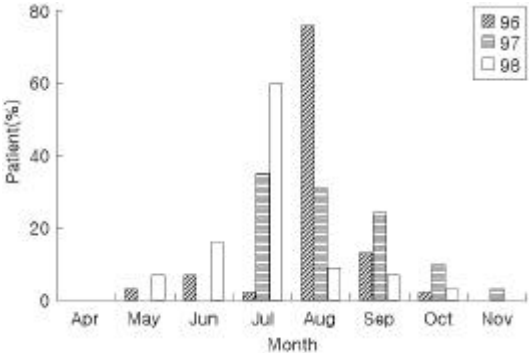


Fig. 1. Monthly distribution of incidence of the children with aseptic meningitis.

1 5가 84 (43.7%)가  
, 6 10 63 (32.8%), 11 15 27  
(14.1%), 12 18 (9.3%)가  
(Table 2).

2.  
1996 1998  
, , , , ,  
4 (2.0%)  
3.8  
(Table 3).

3.  
5,001 10,000/mm<sup>3</sup>  
가 95 (49.5%), 10,001 20,000/mm<sup>3</sup>  
84 (43.8%), 5,000/mm<sup>3</sup>

Table 2. Age Distribution of the Children with Aseptic Meningitis

Age	No. of the cases(%)
< 1 month	2( 1.0)
1 11 month	16( 8.3)
1 5 years	84( 43.7)
6 10 years	63( 32.8)
11 15 years	27( 14.1)
Total	192(100.0)

Table 3. Clinical Features of the Children with Aseptic Meningitis on Admission

Symptoms	No. of the cases(%)
Fever	186(96.8)
Vomiting	166(86.4)
Headache	145(75.5)
Abdominal pain	46(23.9)
Poor oral intake	28( 14.6)
Cough	26(13.5)
Irritability	23(11.9)
Diarrhea	15( 7.8)
Skin rash	11( 5.7)
Convulsion	4( 2.0)

12 (6.3%), 20,000/mm<sup>3</sup> 1 (0.5%) (94.3%) 가  
 . >20 mm/hr 66.1% (Table 5).

30.5 mm/hr 가 , CRP 51.0%, 5 .  
 1 2+ 가 42.2% 2+ 가 93.2%  
 (Table 4).

4 .

500/mm<sup>3</sup> 가 169 (88.0%)  
 40 mg/dL  
 118 (61.5%), 40 mg/dL 가 181

Table 4. Peripheral Blood Findings of the Children with Aseptic Meningitis

Peripheral blood	Findings	No. of the cases(%)
WBC count(/mm <sup>3</sup> )	<5,000	12( 6.3)
	5,001 10,000	95(49.5)
	10,001 20,000	84(43.8)
	>20,000	1( 0.5)
ESR(mm/hr)	20	65(33.9)
	>20	127(66.1)
CRP	-	98(51.0)
	1 2+	13( 6.8)
	>3+	81(42.2)

Table 5. Leukocyte Count, Protein, Glucose of Cerebrospinal Fluid of the Children with Aseptic Meningitis

CSF	Findings	No. of the cases(%)
Leukocyte count(/mm <sup>3</sup> )	0 5	2( 1.0)
	6 50	65(33.9)
	51 100	35(18.2)
	101 500	67(34.9)
	>500	23(12.0)
Protein	<40	118(61.5)
	40 100	68(35.4)
	>100	6( 3.1)
Glucose	40	11( 5.7)
	>40	181(94.3)

5 .

1

6 .

192 61 (31.2%)  
 , 1 23  
 (37.7%), 1 2 27 (44.2%), 2 11  
 (18.0%) 50 (81.9%)가 2 .  
 5  
 1.81 .

가,

infection

parameningeal

가 85%

1).

Nelson 2) 6  
 10 80%, Lake 3) 93%가  
 가 , Chonmaitree 4) 6 10

1989 1990 5) 6 8 ,

1990<sup>6)</sup> 4 7, 1991<sup>7)</sup> 가  
 6 7, 1993<sup>8)</sup> 5 7<sup>11, 15)</sup>  
 , 1993<sup>16)</sup>, <sup>17)</sup> 6, 7, 18, 19)  
<sup>9)</sup> 4 가 ,  
 8 45.4%  
 (95.4%) 5 7 . Kernig Brudzinski  
 1996 1998 5 10  
 1997 7 11 coxsackie-  
 , 1998 (45 ) 1997 (73 ) 1996 virus , ,  
 (74 ) . , ,  
 가 <sup>5)</sup> 3.2 : 1, echovirus  
<sup>7)</sup> 1.7 : 1, <sup>8)</sup> 1.6 : 1, 1993<sup>9)</sup> 1.91 : <sup>20)</sup> , ,  
 2.1 : 1  
 1 . <sup>7)</sup> 2 , 1 , 3  
 1 5 , <sup>5)</sup> 4 5 , <sup>8)</sup> 3 7 , 1993 .  
<sup>9)</sup> 1 4 Wildin <sup>21)</sup>  
 1 5 43.7% 가 5,200 37,800/mm<sup>3</sup> (  
 6 10 32.8% . 12,300/mm<sup>3</sup>) ,  
<sup>18)</sup> 10,000/mm<sup>3</sup> 46.5%,  
 10,000 20,000/mm<sup>3</sup> 38.5% , <sup>20)</sup>  
<sup>10)</sup> , 10,000/mm<sup>3</sup> 10,000 20,000/mm<sup>3</sup>  
 40 50%, <sup>7)</sup> 10,000/mm<sup>3</sup> 67.9%,  
 10,000 15,000/mm<sup>3</sup> 21.4% , <sup>22)</sup>  
 10,000/mm<sup>3</sup> 70%, 10,000 20,000/mm<sup>3</sup>  
 21.9% , 5,001 10,000/mm<sup>3</sup>  
 49.5%, 10,001 20,000/mm<sup>3</sup> 43.8% .  
 가 20 mm/hr 가 1989 1990  
 3 5 <sup>13)</sup> <sup>5)</sup> 44.2%, 1993 <sup>24)</sup> 51%, 1996  
<sup>23)</sup> 67.3% , 1993 <sup>9)</sup>  
 가 27.3 mm/hr  
 20 mm/hr 가 66.1% ,  
 30.5 mm/hr , CRP  
 가 1990 <sup>6)</sup> 53.6%, 1989 1990  
<sup>5)</sup> 71.7%, 1993 <sup>8)</sup> 60%, 1996  
<sup>23)</sup> 51.6% , CRP  
 51.0%, 1 2 + 42.2% 2 +  
 가 93.2% .  
 Wildin <sup>21)</sup>  
 가 2 3,100/mm<sup>3</sup> ( 130/mm<sup>3</sup>),  
 , 가 10 472 mg/dL ( 52 mg/dL), 28 103

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mg/dL( 53 mg/dL) ,  
가가 24%

가 . Singer <sup>11)</sup> .  
가 0 5,500/mm<sup>3</sup> 20,000/ 1891  
mm<sup>3</sup> 15% ,  
60% 가 <sup>25)</sup> .

50% 18% , , , ,  
가 500/ <sup>26, 27)</sup> .

mm<sup>3</sup> 가 88.0% , 40 mg/dL 192 61 (31.3%)  
61.5% , 40 mg/dL 가 94.3% 2 가 81.9%  
5

가 1.81 .

3 21 , , ,  
가 .

24 48  
30 40% , 1 90%  
<sup>21, 24)</sup> .

가 , , , , : 1996 1998 3  
4 -70 가 <sup>4)</sup> .

: 1996 1998  
192  
-20 ,

가 .  
echovirus 4, 6, 9, 11, 30, coxackievirus B5가 1989 : 191:1 ,  
1996 8 (75.7%) 1997 1998  
<sup>5)</sup> enterovirus 71, echovirus 30, 1991 7, 8 .

<sup>7)</sup> coxsackievirus B5, 1993 5,001 20,000/mm<sup>3</sup> 가  
<sup>8)</sup> echovirus 9, 30, coxsackievirus B5, 1993 93.3%  
<sup>9)</sup> echovirus 9 . 가 , CRP 2+ 가  
93.2% .

7 10 1 2 500/mm<sup>3</sup> 가 88.0%, 40  
mg/dL 61.5%, 40 mg/dL  
가 94.3% .  
, SIADH, Guillain-Barré ,

가  
3.8  
31.2%  
1.87  
1996 1998  
가

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