

(1994 1999)

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= Abstract =

Salmonellosis in Children in Daejeon, Korea, 1994 1999

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Purpose : Salmonellosis including typhoid fever is still prevalent in Korea. Recently it has been reported that the incidence of salmonella gastroenteritis is increasing with a reduction of typhoid fever. We studied the clinical and laboratory features of salmonellosis.

Methods : We evaluated the clinical records of 83 patients with salmonellosis who had been confirmed by stool culture from 1994 to 1999.

Results : Annual incidence of salmonellosis showed an increasing tendency during recent 4 years. Seasonally, summer(45.8%) was the most prevalent, followed by fall(32.5%). Male to female ratio was 1.4 : 1. In age distribution, 64 cases(77.1%) were under 5 year-old, and 18 cases(21.7%) were younger than 1 year-old. Clinical features included diarrhea(96.4%), fever(91.6%), vomiting(49.4%), bloody stool(42.1%), abdominal pain(40.1%) and tenesmus(12.0%). In serogroups, there was no group A and group B, group C, group D(including 2 cases of *S.typhi*) and group E were in 41.0%(34 cases), 3.6%(3 cases), 51.8%(43cases) and 3.6%(3 cases), respectively. In Widal test, 5 cases(13.5%) and 1 case(2.7%) of group B, C and E(total 37 cases) were observed the O titer above 1 : 80 and 1 : 320, respectively. However, in 36 cases of group D, 19 cases(52.7%) and 9 cases(25.0%) were above the O titer 1 : 80 and 1 : 320, respectively. Antibiotics resistant rates to ampicillin, trimethoprim/sulfamethoxazole and chloramphenicol were 23.2%, 10.1% and 51.4%, respectively.

Conclusion : Salmonellosis has become a common cause of gastroenteritis in children, especially under the pre-school age. Isolation of salmonella is necessary for accurate diagnosis of gastroenteritis and typhoid fever. A careful attention of the use of antibiotics is needed to reduce the multi-drug resistant strains.

Key Words : Salmonellosis, Serogroup, Widal test

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S.typhi 가 1994 1 1999 12 6 가 83 , Widal , McConkey , Selenite-F broth Salmonella-shigella 1 , 4 (TSI , MIO , Citrate , Urease) (serotype) 7 (Poly, Vi, A, B, C, D, E) Kirby-Bauer ampicilline, trimethoprim-sulfamethoxazole(bactrim), chloramphenicol, gentamicin, tobramycin, amikacin, ciprofloxacin, aztreonam, imipenem, cephalothin, cefuroxime, ceftriaxone, sulperazone 13

1. 1994 3 , 1995 7 14 23 4 가 1996 1999 1995 2 (Fig. 1). 38 (45.8%) 가 가 27 (32.5%), 12 (14.5%), 6 (7.2%) (Fig. 2). 2. 0 14 가 48 (57.85%), 가 35 14 : 1 . 5 가 64 (77.1%) 1 18 (21.7%) (Fig. 3). 3. 2 81 가 80 (96.4%) 가 (91.6%), (49.4%), (42.1 %), (40.1%), tenesmus(12.0%), (7.2%), (3.6%), (2.4%) (Table 1). 가 38 , 가 45 2

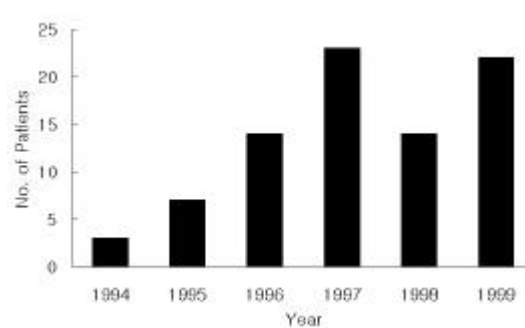


Fig. 1. Annual cases of salmonellosis in children, 1994 1999.

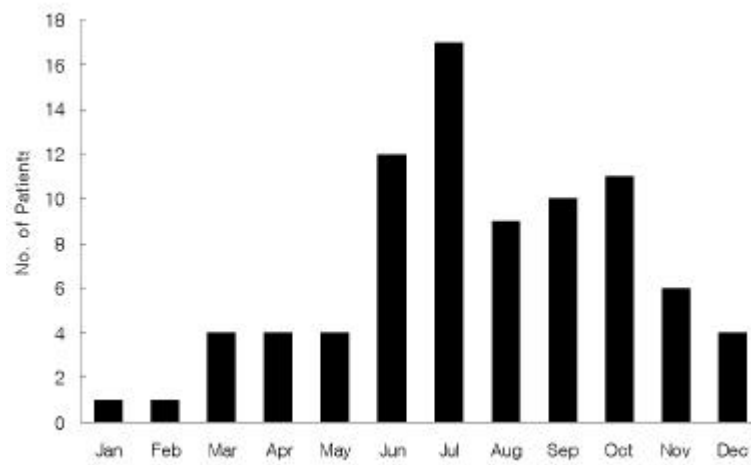


Fig. 2. Monthly distribution of salmonellosis.

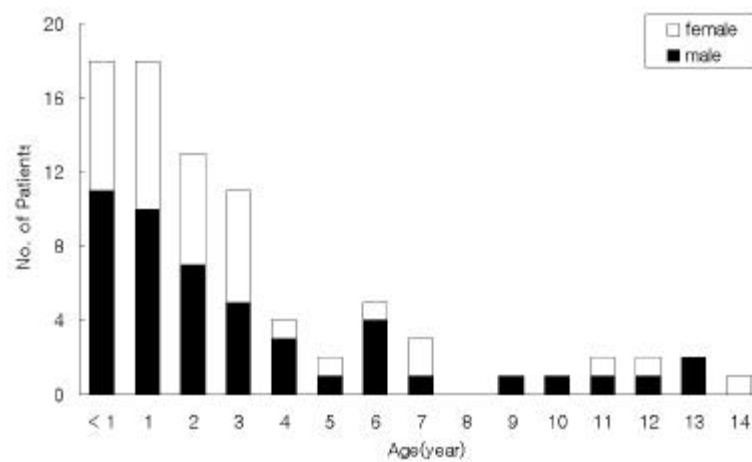


Fig. 3. Age and sex distribution of salmonellosis in children.

4 .

(serogroup) 83 A , B
34 (41.0%), C 3 (3.6%), D 43 (51.8%),
E 3 (3.6%) (Table 2). Widal
가 B, C E 37 O titer 1 : 80
5 (13.5%), 1 : 320 1 (2.7%)가
, H titer 1 : 80 1 (2.7%)
D 43 Widal 36

Table 1. Clinical Features on Admission

Symptoms & Signs	No. of Patients	%
Diarrhea	80	96.4
Fever	76	91.6
Vomiting	41	49.4
Bloody stool	35	42.1
Abdominal pain	33	40.1
Tenesmus	10	12.0
Headache	6	7.2
Convulsion	3	3.6
Lethargy	2	2.4

Table 2. Serogroups of Salmonella	
Serotype	No.(% of Total)
A	0(0.0%)
B	34(41.0%)
C	3(3.6%)
D	43(51.8%)*
E	3(3.6%)
Total	83(100.0%)

* : contained 2 cases of *S.typhi*

Table 3. Results of Widal Test			
Serotype	No. tested	Widal test(O titer)	
		1 : 80 No.(%)	1 : 320 No.(%)
A	0		
B	32	5(15.6)	1(3.1)
C	3	0(0.0)	0(0.0)
D	36	19(52.7)	9(25.0)
E	2	0(0.0)	0(0.0)

* : contained 2 cases of *S.typhi*

O titer 1 : 80 19 (52.7%), 1 : 320 9 (25.0%), H titer 1 : 80 5 (11.6%)가 (Table 3). D *S.typhi* 2 O titer 320 : 1, H titer 1 : 160 5,000/mm³ 5 (6.0%), 5,000 10,000/mm³ 31 (37.3%), 10,000/mm³ 47 (56.6%) . 가 AST, ALT 7 . CRP 69 가 (83.1%), 1 5mg/dL 49 , 6 10mg/dL 8 , 11 15mg/dL 6 , 15 20mg/dL 4 , 21mg/dL 2 . 5 .

13 , (Table 4). Ampicillin 69 53 (76.8%)가 chloramphenicol 48.6% 가 ,

Table 4. Antibiotics Susceptibilities of Isolated Salmonella

Antibiotics	No. tested	No. of positive	% of total
Ampicillin	69	53	76.8
Bactrim	69	62	89.9
Chloramphenicol	37	18	48.6
Gentamicin	47	45	95.7
Tobramycin	14	14	100.0
Amikacin	54	53	98.1
Ciprofloxacin	74	68	91.9
Aztreonam	35	34	97.1
Imipenem	44	44	100.0
Cephalothin	48	34	70.8
Cefuroxime	49	47	95.9
Ceftriaxone	12	12	100.0
Sulperazone	25	25	100.0

aminoglycoside 3 cephalosporin 100% .

noncapsulated . Enterobacteriaceae family *S.typhi*, *S.choleraesuis* *S.enteritidis* 3 species . *S.typhi* *S.choleraesuis* *S.enteritidis* 2,000

so-matic O Kauffmann-White A, B, C, D E 5가 (outbreak) 6) .

8, 9) . 가 1 가

(enteric fever),

가 , ,

serogroup

1 5) .

70 가 ,

90 *S.typhi*가

(Table 1).

가 . 1970 ,

*S.typhi*가 90% 1980 가

60% , 90 25% 가 ,

90 B (rapid gastric emptying)

(*S.typhimurium*) , 1996 D 13) .

(*S.enteritidis*) 가 .

가

가 14) .

83

D 41 (49.4%), B 34 (41.0%),

C 3 (3.6%), E 3 (3.6%) *S.typhi* 2

(2.4%)가 (Table 2).

가

1994 ,

4) 52 : 48 19 가

24.2% , 4 가

11.1%

. 1984 34

10) 2 3 가 15 (44.1%)

가 , B 17 가

(50.0%) 가 C (23.5%), D (23.5%), E

(8.8%), A 2.9% 5

가 64 (77.1%)

Widal

1 18 (21.7%) (Fig. 3).

5 9

4, 5, 11) ,

38 (45.8%) 27 (32.5%)가

가

가

(Table 3).

가 ,

1

3

8, 12) .

가

14, 18) .

S.typhi

가

3 5, 19, 20)

가

lin, trimethoprim-sulfamethoxazole(Bactrim) chlor-
amphenicol 23.2%, 10.1% 51.4%
aminoglycoside 3 cephalo-
sporin
(Table 4).

: 1996 1999

14 23 4 가

45.8%, 가 32.5%가 .

가 48 (57.8%) 14 : 1 , 5

가 64 (77.1%) 1

18 (21.7%) .

가 80 (96.4%) 가

(91.6%), (49.4%), (42.1%),
(40.1%), tenesmus(12.0%), (7.2%), (3.6
)%, (2.45%) .

(serogroup) 83 A

0%, B 41.0%, C 3.6%, D 51.8% E

3.6% . Widal B, C E 37

O titer 1 : 80 5 (13.5%), 1 : 320

1 (2.7%)가 , D 36 O titer 1 : 80

19 (52.7%), 1 : 320 9 (25.0%)

ampicillin, tri-
methoprim-sulfamethoxazole chloramphenicol
23.2%, 10.1% 51.4% ,
aminoglycoside 3 cephalosporin

:

가

가

가

83

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