

FEBRILE PERIOD AND MAXIMUM BODY TEMPERATURE IN PATIENTS WITH MEASLES OVER 15 YEARS OLD

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Abstract. The medical records of Japanese patients with measles, age 15 to 39 years old, were analyzed for febrile period in 200 patients and maximum body temperature in 211 patients. The febrile periods by age group were as follows: 7.7 ± 1.4 days, 7.8 ± 1.7 days, 8.1 ± 1.7 days, 8.1 ± 2.4 days and 7.5 ± 1.4 days in 15-19, 20-24, 25-29, 30-34 and 35-39 year-olds, respectively. No significant differences in febrile periods were identified among the different age groups. A maximum body temperature over 40°C was seen in 61, 58, 59, 50 and 33% of the 15-19, 20-24, 25-29, 30-34 and 35-39 year-olds, respectively. The results of our study indicate age is not a determining factor for febrile period, but maximum body temperature may be lower in older than in younger patients with measles.

INTRODUCTION

Measles is an acute febrile viral disease caused by infection with the measles virus, classified as a morbillivirus in the paramyxovirus family, and found worldwide. Although most patients with measles recover spontaneously, measles may be complicated by illnesses, such as pneumonia, otitis media and encephalitis. In many developed countries, this viral infectious disease has become rare due to the routine use of vaccinations. However, measles is endemic in Japan, undoubtedly owing to the low vaccination rate. Many Japanese adolescents and adults suffer from measles every year (National Institute of Infectious Diseases, 2007). This viral infection has had a substantial impact on Japan both clinically and economi-

cally, and it is imperative for the Japanese government to control measles in Japan. Measles is generally considered a childhood infection, and as a result, clinical symptoms and signs in adolescents and adult patients have not been fully studied, however, knowing the clinical presentation is important. This paper deals with Japanese adolescent and adult patients with measles, from the viewpoint of whether age is related to febrile period and maximum body temperature.

MATERIALS AND METHODS

Patients with measles were defined by the presence of fever, a generalized macular papular rash, and the presence of serum IgM antibodies against the measles virus. Two hundred forty adolescent and adult patients with measles were admitted to the Department of Infectious Diseases, Tokyo Metropolitan Bokutoh General Hospital from January 1, 2000 to December 31, 2007. All patients were Japanese and contracted the disease in Japan. The age distribution,

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number of patients and number of patients with complications, are shown in Tables 1a and 1b. The number of patients over age 40 was 4, these were excluded from this study because of their small number. Seventeen other patients with complications were also excluded.

The medical records of the remaining 219 measles patients age 15 to 39 years old were analyzed for febrile period and maximum body temperature.

RESULTS

Febrile period

The length of the febrile (>37°C) period was available in 200 patients; the febrile period in the 19 other patients was not available. None of the patients received anti-inflammatory drugs routinely after admission. The febrile periods of the patients in each age group are shown in Table 2. No significant differences in febrile period were identified among the various age groups by Student's *t*-test.

Maximum body temperature

The maximum body temperature was

available in 211 patients; in the other 8 patients it was not available. The results are shown in Table 3. The maximum body temperature tended to be lower in the older patients than in the younger patients.

DISCUSSION

The measles is usually a disease of childhood and is thought not to be as common in adults. It is not known whether the severity is age-dependent. To the best of our knowledge, only a handful of investigators have reported the febrile period in adult measles

Table 1a
Age distribution and number of patients.

Age group (years)	Number of patients		
	Male	Female	Total
15-19	38	36	74
20-24	40	45	85
25-29	25	19	44
30-34	6	13	19
35-39	4	10	14
40-53	4	0	4
Total	117	123	240

Table 1b
Number of patients with complications.

Age group (years)	Number of patients						
	P	E	AM	OM	EO	MP	E+LA
15-19	0	1	0	0	0	0	0
20-24	5	1	0	2	1	0	0
25-29	0	0	1	1	0	1	1
30-34	1	0	0	1	0	0	0
35-39	0	0	0	0	0	1	0
40-53	0	0	0	0	0	0	0
Total	6	2	1	4	1	2	1

P, pneumonia; E, encephalitis; AM, aseptic meningitis; OM, otitis media; EO, external otitis; MP, mandibular periostitis; LA, lung abscess

Table 2
Length of febrile period and age distribution of measles patients.

Age group (years)	Days of febrile period (mean±SD)		
	Males	Females	Total
15-19	7.7±1.1 (n=34)	7.6±1.7 (n=35)	7.7±1.4 (n=69)
20-24	7.8±1.5 (n=31)	7.8±1.9 (n=36)	7.8±1.7 (n=67)
25-29	8.3±1.4 (n=21)	7.9±2.0 (n=16)	8.1±1.7 (n=37)
30-34	7.6±2.8 (n=5)	8.4±2.2 (n=11)	8.1±2.4 (n=16)
35-39	7.0±0.8 (n=4)	7.7±1.7 (n=7)	7.5±1.4 (n=11)

Table 3
Number of patients and maximum body temperature of patients.

Age group (years)	<38°C	≥38°C~39°C	≥39°C~40°C	≥40°C	Total
15-19	0	1 (1.4%)	27 (37.5%)	44 (61.1%)	72
20-24	0	2 (2.8%)	28 (38.9%)	42 (58.3%)	72
25-29	0	0	16 (41.0%)	23 (59.0%)	39
30-34	0	1 (6.3%)	7 (43.8%)	8 (50.0%)	16
35-39	0	0	8 (66.7%)	4 (33.3%)	12
Total	0	4 (1.9%)	86 (40.8%)	121 (57.3%)	211

patients (Ito *et al*, 2003; Takayama and Sukanuma 2003). It was reported the febrile period in 48, 18 and 18% of 105 adult measles patients between the ages of 18 and 52 years old is 7-8, 5-6 and 9-10 days, respectively, 40% and 33% of 45 children with measles age 1 to 5 years old was 7-8 and 5-6 days, respectively, and no significant differences were seen in the febrile period between the 105 adults and 45 children (Takayama and Sukanuma, 2003). Other investigators reported a mean febrile period in 9 measles patients age 18-37 years old as 6.9 days (Ito *et al*, 2003). Those reports indicate the febrile period may not be associated with the age of the patient. However, they did not investigate febrile period by age groups. Our results indicate the febrile period is not influenced by age in adolescent and adult patients with measles between the ages of 15 and 39.

There have been several recent investigations regarding maximum body temperature in adult patients with measles (Takayama and Sukanuma, 2003; Sakuta *et al*, 2008). Patients with a body temperature >40°C are less likely to be older than younger. A maximum body temperature > 40°C was found in 50% of measles patients age 18 to 52 years old, but no significant differences were seen in maximum body temperature between adults and children with measles in one study (Takayama and Sukanuma, 2003). According to Sakuta *et al* (2008), the mean maximum body temperatures of patients with measles age 20.3±2.6 years old and 27.3±8.7 years old were 40.4±0.6 and 39.3±0.6°C, respectively. Although they did not investigate maximum body temperature by age group, the results of their and our studies show the maximum

body temperature in older patients is not higher than in younger patients. The results of our and another study (Sakuta *et al*, 2008) show the maximum body temperature may be lower in older patients than in younger patients with measles. Further studies with more patients are needed to confirm this finding.

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