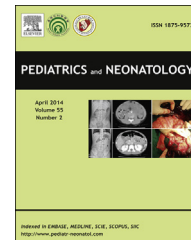




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ORIGINAL ARTICLE

Epidemiological Features of Kawasaki Disease in Taiwan, 1976–2007: Results of Five Nationwide Questionnaire Hospital Surveys



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Key Words

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Background: Kawasaki disease (KD) affects mainly children younger than 5 years of age, leading to coronary artery lesions, and even to life-threatening myocardial infarction. In Taiwan, KD was encountered for the first time in 1976; then, it continued to occur in increasing numbers.

Methods: For the survey of epidemiological features of KD in Taiwan, we conducted five nationwide questionnaire hospital surveys in 1987, 1992, 1994, 2001, and 2008, respectively. In each survey, a special questionnaire form, together with a request letter and diagnostic guidelines for KD, was sent to the chairman of the Department of Pediatrics of all hospitals with 100 or more beds in Taiwan.

Results: KD patients increased to a total of 14,399 patients by 2007, with the highest number of 1018 in 2001, and the highest incidence of 66.24 per 100,000 children < 5 years of age in 2006. Of the 14,399 patients, the male-to-female ratio ranged from 1.5 to 1.7. Of these patients, 57.6–65.2% were < 2 years of age, 23.3–26.6% were 2–4 years of age, and 11.4–15.8% were ≥ 5 years of age. Coronary artery lesions were noted in 20.2–31.5% of patients. Fourteen cases expired, documenting that the fatality rate decreased from 0.4% to 0.03% during the 31 years from 1976 to 2007.

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Conclusion: In Taiwan, KD was encountered for the first time in 1976, and it continued to occur, reaching the highest annual incidence of 66.24 per 100,000 children < 5 years of age in 2006. In Taiwan, the first emergence of KD came in 1976; the annual increment of the incidence rate was lower (2.41 in Taiwan vs. 4.17 Japan), and no significant KD outbreak was observed in Taiwan.

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1. Introduction

Taiwan is an island country with a population of 23 million and an area of 35,680 Km². Kawasaki disease (KD), first described by Dr. Tomisaku Kawasaki¹ in 1967, was encountered for the first time in Taiwan in 1976.^{2,3} KD continued to occur, with increased numbers. For the survey of epidemiological features of the disease in Taiwan, we conducted four nationwide questionnaire hospital surveys, with the method designed by Japan Kawasaki Disease Research Committee,⁴ in 1987, 1992, 1994, and 2001.^{2,5–9} Utilizing the Taiwan National Health Insurance (NHI) database, which had been implemented since 1995, covering 98% of the population in Taiwan, we also estimated the annual incidence rates of KD during the period from 1996 to 2007.^{13–15} We conducted the fifth national questionnaire hospital survey in 2008, the results of which and those of the previous four surveys were analyzed together and reported here in this study.

2. Materials and Methods

A questionnaire survey form, designed for a retrospective study of KD patients, together with a request letter and the guidelines for diagnosis of KD and coronary artery lesions proposed by the Japan Kawasaki Disease Research Committee,¹⁰ the Council of Cardiovascular Disease in the Young, American Heart Association,¹¹ and our study group,¹² was sent to the chairs of pediatric departments of all hospitals with 100 or more beds in Taiwan, registered in the Taiwan Pediatric Association. It was requested that all KD patients admitted during each survey period, whose symptoms and signs at the first hospital visit, and their echocardiographic examinations agreed with the diagnostic criteria,^{10,12} were to be reported.

In each year, the number of reported KD cases was obtained. The number was divided by the total number of children below 5 years of age in Taiwan each year (Taiwan census data). The annual incidence rate of KD was calculated as the number of KD per 100,000 children < 5 years of age.

2.1. Statistical analysis

Analysis of the data was carried out using the computer statistical package IBM SPSS Statistics 20.0 for Windows (SPSS Inc., Chicago, IL, USA). Significance was assigned for $p < 0.05$. Linear regression was used for the analysis of changing trends of the annual incidence rates of KD.

3. Results

The number of hospitals surveyed was 18 in 1987, 21 in 1992 and 1994, and 40 in 2001, increasing to 94 in 2008. In each survey, all the hospitals responded and submitted their duly filled forms to us for analysis.

The first case of KD was found in 1976. Since then it continued to occur with increasing numbers, spreading from Taipei, the capital city of Taiwan, to the central region of Taiwan in 1978, to southern Taiwan in 1980, and then to the eastern Taiwan in 1985, thus spreading over the entire island of Taiwan.^{2,5} The annual incidence rate increased to 24.83 in 1986, 47.5 in 1996, and 62.03 in 2001, reaching the highest incidence of 66.24 in 2006, with the accumulated number of patients totaling 14,399 in 2007 (Table 1 and Figure 1).

Of the patients reported in each survey period, the male-to-female ratios stayed fixed, ranging from 1.5 to 1.7. More than half of the patients, 57.6–65.2% were < 2 years of age, 23.3–26.6% were of age 2–4 years, and only 11.4–15.8% were ≥ 5 years of age. Acute coronary artery lesions were noted during the admission in 20.2–31.5% of the patients. A total of 14 patients died: four in the

Table 1 Number of cases and annual incidence of Kawasaki disease in Taiwan; Nationwide Questionnaire Hospital Surveys, 1976–2007.

Year	No. of cases	Incidence per 10 ⁵ children < 5 y of age	Year	No. of cases	Incidence per 10 ⁵ children < 5 y of age
1976	1	0.06	1992	398	24.48
1977	3	0.16	1993	512	31.64
1978	12	0.64	1994	523	32.50
1979	16	0.88	1995	563	35.50
1980	17	0.81	1996	750	47.50
1981	36	1.81	1997	677	42.40
1982	35	1.76	1998	846	54.90
1983	90	4.52	1999	801	53.30
1984	164	8.40	2000	804	54.10
1985	168	8.88	2001	1018	62.03
1986	440	24.83	2002	860	53.52
1987	282	16.79	2003	760	48.55
1988	293	17.88	2004	838	57.16
1989	276	17.23	2005	897	63.62
1990	324	20.14	2006	871	66.24
1991	308	19.02	2007	816	63.56
			Total	14,399	—

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