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Letter to the Editor

Prevalence of atopic dermatitis in Japanese adults and community validation of the U.K. diagnostic criteria

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To the Editor,

Atopic dermatitis (AD) is a common inflammatory skin disease characterized by chronic, relapsing pruritic eczematous lesions. Although there have been numerous epidemiological studies on the prevalence of AD in children and adolescents, there have been few in adults [1–6]. Most of the studies done were based on questionnaires [1–4]. We evaluated the prevalence of AD in Japanese adults based on regular health check-ups by dermatologists at Tokyo University in 2004 [6]. A total of 2123 staff members were examined in the study. The prevalence of AD was 6.9% overall, and 9.8%, 8.7%, 4.4% and 2.6%, respectively, for those in their 20s, 30s, 40s and 50s/60s, with that in women being higher than that in men (9.3% vs. 5.1%). Overall, 76.7%, 18.5%, 3.4% and 1.4% of those afflicted were in the mild, moderate, severe and very severe groups, respectively [6]. The objective of this current study was to confirm these results by evaluating the prevalence of adult AD in other areas of Japan, because there have been few studies in adults.

A simple list of diagnostic criteria for AD for use in epidemiological studies was developed by a U.K. working party [7]. This list served well for both hospital patients with skin diseases and in general population within the U.K. The U.K. diagnostic criteria were validated in other countries [8] and we also validated them in Japanese elementary schoolchildren in 2001 and 2004 [9]. Comparing the U.K. criteria with the findings on clinical examination used as the reference standard, the U.K. criteria showed a sensitivity of 71.8%, specificity of 89.3% and positive predictive value of 44.7% [9]. To the best of our knowledge, there has been no validation study in general adult population. Another objective of this study was to validate the U.K. criteria in Japanese adults.

For a pre-nationwide study, two more prefectures: Hokkaido and Osaka were chosen from two other areas: Hokkaido (Northern Japan) and Kinki (Central to Western Japan), respectively, in addition to Tokyo prefecture (Kanto area: Eastern Japan). The target population was staff members visiting the Health Service Center of Kinki University (Osaka) and Asahikawa Medical College (Hokkaido) for annual health check-ups in 2007 and 2008,

respectively. Permission was obtained from the Board of the Health Service Center of both institutions. AD was diagnosed by experienced dermatologists based on the Japanese Dermatological Association criteria for the disease [10]. The severity of AD was graded as mild, moderate, severe or very severe according to the criteria shown elsewhere [6]. The χ^2 -test was used to analyze the results, and $p < 0.05$ was considered statistically significant. A questionnaire was distributed to the participants before the skin examination, completed and collected after the survey. The questions on AD were taken from the U.K. criteria and AD was also diagnosed using these criteria. Prevalence based on clinical diagnosis by dermatologists and the U.K. criteria was compared.

Table 1 shows the prevalence and severity of AD at Kinki University and Asahikawa Medical College. A total of 2137 (1051 men and 1086 women) staff members were examined in this study. The average age was 40.6 ± 12.0 years (men: 44.7 ± 11.6 and women: 36.7 ± 11.1) ranging from 20 to 69 years. The prevalence of AD was 6.1% overall, and 10.5%, 7.8%, 3.9% and 2.5%, respectively, for those in their 20s, 30s, 40s and 50s/60s (Table 1). If we discarded the 20s data in order to exclude the influence of the age of adolescence, the overall prevalence would be 4.9%. The prevalence of 30s was significantly higher than that of 40s ($p < 0.01$). The prevalence of women was higher than that of men overall (7.3% vs. 4.9%, $p < 0.05$), although it must be taken into consideration that the average age of women was lower than that of men (36.7 years vs. 44.7 years). There was no significant difference in prevalence between the two sexes in each generation. Overall, 84.6% and 15.4% of those afflicted were in the mild and moderate groups, respectively (Table 1). The prevalence of moderate AD in men was higher than that in women (23.5% vs. 10.1%, $p < 0.05$). There was no severe or very severe AD in this study. Among the 2137 staff members, 2120 completed the questionnaire. Comparing the U.K. criteria with the findings on clinical examination, the U.K. criteria showed a sensitivity of 68.8% (88/128), specificity of 93.5% (1863/1992) and positive predictive value of 40.6% (88/217) (Table 2).

The results obtained from the health check-ups at Tokyo University and those from Kinki University and Asahikawa Medical College showed the same tendency: (i) an overall prevalence of adult AD ranging from 5% to 7%; (ii) the prevalence decreased with age, and especially there was a significant difference between the 30s and 40s, suggesting frequent recovery during these ages; (iii) approximately 80% of AD cases were in the mild group. In 2003, Muto et al. [1] reported the prevalence of adult AD in Japan using the questionnaires. The point prevalence of AD was 2.9%, and no significant statistical differences were observed between the sexes or among age groups within each sex [1]. The discrepancy between their results and ours is mainly due to the difference of investigative methodology. Although the number and community in our studies are still limited, the result suggests that AD is one of the most common skin diseases not only in children and adolescents but also in adults, especially in their 20s and 30s. In addition, the results of validation study for Japanese elementary schoolchildren and those for adults also indicated the same tendency: the sensitivity and

Table 1
Prevalence and severity of atopic dermatitis (AD) determined by clinical examination in Japanese adults.

Age group	AD patients			Number of participants			Prevalence (%)			Severity (%)		
	Men	Women	Total	Men	Women	Total	Men	Women	Total	Mild	Moderate	
Staff members at Kinki University												
20s	0	5	5	18	55	73	0.0	9.1	6.8	20s	80.0	20.0
30s	11	4	15	128	92	220	8.6	4.3	6.8	30s	86.7	13.3
40s	7	4	11	129	63	192	5.4	6.3	5.7 ^a	40s	100.0	0.0
50s/60s	5	3	8	264	71	335	1.9	4.2	2.4 ^a	50s/60s	75.0	25.0
Total	23	16	39	539	281	820	4.3	5.7	4.8	Total	87.2	12.8
										Men	82.6	17.4
										Women	93.8	6.3
Staff members at Asahikawa Medical College												
20s	9	34	43	82	302	384	11.0	11.3	11.2	20s	90.7	9.3
30s	12	23	35	170	254	424	7.1	9.1	8.3 ^b	30s	74.3	25.7
40s	4	3	7	143	132	275	2.8	2.3	2.5 ^b	40s	85.7	14.3
50s/60s	3	3	6	117	117	234	2.6	2.6	2.6	50s/60s	83.3	16.7
Total	28	63	91	512	805	1317	5.5	7.8	6.9	Total	83.5	16.5
										Men	71.4	28.6 ^c
										Women	88.9	11.1 ^c
Staff members at Kinki University and Asahikawa Medical College												
20s	9	39	48	100	357	457	9.0	10.9	10.5	20s	89.6	10.4
30s	23	27	50	298	346	644	7.7	7.8	7.8 ^d	30s	78.0	22.0
40s	11	7	18	272	195	467	4.0	3.6	3.9 ^d	40s	94.4	5.6
50s/60s	8	6	14	381	188	569	2.1	3.2	2.5	50s/60s	78.6	21.4
Total	51	79	130	1051	1086	2137	4.9 ^e	7.3 ^e	6.1	Total	84.6	15.4
										Men	76.5	23.5 ^f
										Women	89.9	10.1 ^f

- ^a The prevalence of 40s was higher than that of 50s/60s ($p < 0.05$).
^b The prevalence of 30s was higher than that of 40s ($p < 0.001$).
^c The prevalence of moderate AD in men was higher than that in women ($p < 0.05$).
^d The prevalence of 30s was higher than that of 40s ($p < 0.01$).
^e The prevalence of women was higher than that of men ($p < 0.05$).
^f The prevalence of moderate AD in men was higher than that in women ($p < 0.05$).

Table 2
Relationship between the U.K. diagnostic criteria and clinical examination.

	Clinical examination		Total
	Present	Absent	
U.K. criteria			
Present	88	129	217
Absent	40	1863	1903
Total	128	1992	2120

specificity were about 70% and 90%, respectively. Now that we know the sensitivity and specificity of the U.K. criteria in the population examined in this study, we will be able in the near future to estimate the prevalence of AD in a similar population with reverse operation using questionnaires alone. Therefore, the validation study of U.K. criteria could be useful for future epidemiologic surveys.

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