

Prevalence of Atopic Dermatitis among Korean Adults Visiting Health Service Center of the Catholic Medical Center in Seoul Metropolitan Area, Korea

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The point prevalence of atopic dermatitis (AD) among Korean adults visiting the Health Service Center for health check-ups was assessed. AD was diagnosed based on the questionnaires filled by patients and through physical examination by dermatologists. A total of 3,563 persons completed the questionnaires, and 2,032 persons were examined by the dermatologists. According to the questionnaires, the prevalence of AD was 7.1%, and from the dermatologists' examination, it was 2.6% overall, which decreased with age significantly. The prevalence in men was higher than that of women. Grading the severity of AD according to their eczema area and severity index scores, 70.6% were classified as being mild, 25.5% moderate, and 3.9% severe. Interestingly, concomitance of psoriasis and AD was found in 0.5% of those examined by the dermatologists. Our results suggest that AD is one of the most common skin diseases not only in children but also in adults in Korea.

Key Words: Adult; Dermatitis, Atopic; Hanifin and Rajka criteria; Prevalence; Physical Examination; Psoriasis; Questionnaires; Severity

Atopic dermatitis (AD) is a chronic, relapsing skin disease characterized by pruritus. Numerous previous studies have focused on the prevalence of AD in children, and shown that the prevalence has been increasing recently (1, 2). However, AD is often thought to be a disease predominantly afflicting children that few investigations have directed their attention to adult AD (3, 4). To the best of our knowledge, there has been no study on the point prevalence of AD in the general adult population in Korea. The purpose of this study was to measure the prevalence of AD among Korean adults. In addition, we examined the coincidence of psoriasis among the AD patients.

The target population was the people aged 19 yr or above visiting the health service centers of the Catholic Medical Center-Seoul St. Mary's hospital, St. Mary's hospital, Uijeongbu St. Mary's hospital, St. Vincent's hospital, Incheon St. Mary's hospital, and Bucheon St. Mary's Hospital-for annual health check-

ups in June 2009. An informed consent was obtained from all who participated in the study.

The diagnosis of AD was made by two methods. First, the participants were given a questionnaire to fill out while waiting for their health examination. The questionnaire included a series of questions taken from the Hanifin and Rajka criteria (5) translated into Korean. After completing the study questionnaire, the participants who granted consent were visited and examined by the dermatologists who confirmed AD diagnosis based on the Hanifin and Rajka AD criteria (5). The severity of AD was graded as mild, moderate, or severe according to the eczema area and severity index (EASI) score (6): mild, EASI score <6; moderate, EASI score ≥6; and severe, EASI score ≥18. Additionally, to measure coincidence of AD and psoriasis, the participants were asked if they had psoriasis and if they had past history of psoriasis. The diagnosis of psoriasis was also

Table 1. Prevalence of atopic dermatitis according to patients' age and gender in Korea (%)

Method	Age groups (yr)						P value	Gender		
	Overall	19-29	30-39	40-49	50-59	60+		Men	Women	P value
Questionnaire	7.1	8.9	8.4	7.3	5.6	4.7	NS	7.7	6.7	NS
Physical examination	2.6	2.4	4.5	3.2	1.2	0.4	0.003	4.2	1.3	<0.001

NS, not significant.

confirmed by the physical examination of dermatologists. This study was approved by the Institutional Review Board at the Catholic Medical Collage, the Catholic University of Korea, Seoul (ZC09WZZZ0055K).

Statistical analysis was performed using the chi-square test or Fisher exact test where appropriate. *P* values ≤ 0.05 were considered statistically significant (SAS ver 9.1.3, SAS institute Inc., Cary, NC, USA).

A total of 3,563 (1,696 men and 1,860 women) participants completed the questionnaire, and 2,032 (890 men and 1,142 women) of them were examined by the dermatologists. Mean age was 45.1 yr of those who completed the questionnaire and 47.2 yr, examined by the dermatologists.

According to the self-completed questionnaire, the point prevalence of AD was 7.1% overall, and 8.9%, 8.4%, 7.3%, 5.6%, and 4.7%, respectively, for those in their 10s/20s, 30s, 40s, 50s, and 60s/70s (Table 1). The prevalence showed no significant differences by the age groups. Also, no significant difference was observed between the sexes.

On the dermatologists' examination, the point prevalence of AD was 2.6% overall, and 2.4%, 4.5%, 3.2%, 1.2%, and 0.4%, respectively, for those in their 10s/20s, 30s, 40s, 50s, and 60s/70s. It decreased with age ($P=0.003$) (Table 1). The prevalence of men was significantly higher than that of women overall ($P<0.001$).

Grading the severity of AD as mild, moderate, severe according to their EASI scores, 70.6% of those diagnosed as AD were classified as being mild, 25.5% moderate, and 3.9% severe. Interestingly, the simultaneous presence of psoriasis and AD was found in 10 (0.5%) of the persons examined by the dermatologists.

The results of our study and many previous studies (7-11) on the prevalence of AD among adults show the same tendency: 1) an overall prevalence of adult AD range from 2.5% to 9.5%; 2) the prevalence decrease with age; 3) over 70% of AD patients are in the mild group.

In a recent study in Japan, Saeki et al. (8) reported the prevalence of AD based on physical examination by dermatologists among adults in Japan. AD was diagnosed based on the Japanese Dermatological Association criteria for the disease. A total of 2,123 (1,220 men and 903 women) officials aged 20-69 yr were examined. The prevalence of AD was 6.9% overall, and 5.1% and 9.3% respectively, for men and women. The prevalence tended to decrease with age. The severity of AD was grad-

ed as mild, moderate, severe or very severe according to the body surface area involved. Overall, 76.7%, 18.5%, 3.4%, and 1.4% of those afflicted were in the mild, moderate, severe and very severe groups, respectively.

In 2009, Lan et al. (11) reported the prevalence of adult AD among the nursing staff in Taiwan based on the dermatologists' diagnosis according to the Hanifin and Rajka criteria (5). A total of 1,131 (7 men and 1,124 women) nursing staff members were examined by dermatologists. The prevalence of AD was 8.0% overall and there was a trend of decreasing prevalence with advancing age with no statistical significance.

In contrast to the previous studies (7-10, 12) where there was no significant statistical differences of AD prevalence between the gender or slight female preponderance, our result showed significantly higher prevalence of AD in male adults compared to females according to the physical examination. Whether this difference reflects a higher prevalence of AD among Korean men compared to Korean women is unclear at present. In order to generalize this result to the entire Korean adult population, sources of potential selection bias such as area of residence, socio-economic status and the voluntary nature of health check-ups should be controlled.

In this study, 104 (5.1%) of 2,032 participants examined by dermatologists had psoriasis or a past history of psoriasis. It was 94 (4.8%) of 1,980 participants without AD and 10 (19.2%) of 52 participants with AD. A more in-depth analysis of this result revealed that the odd ratio of psoriasis in AD patients is 4.8, which means the prevalence of psoriasis among the AD patients is 4.8 times that of the normal population. It had been believed that psoriasis and AD were mutually exclusive due to the conflicting immune defense patterns; there was a predominance of Th1 cytokines, namely interferon gamma, in psoriatic plaques, in contrast to the predominance of Th2 cytokines found in atopic dermatitis (13). However, many studies (14-16) have reported concurrent and/or consecutive coincidence of the two conditions. In 1992 Beer et al. (15) reported that 16.7% of AD patients had psoriasis, and 9.5% of psoriasis patients had AD. With regard to psoriasis and AD, it should be solved whether such a case represents a random coincidence or true association between the diseases.

Despite the limited number of persons included in our study, our results suggest that AD is one of the most common skin diseases not only in children but also in adults in metropolitan Seoul, Korea.

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