

Recent Statistics on Atopic Dermatitis in Korea: Five-Year Nationwide Analysis from 2008 to 2012

Keywords: Atopic dermatitis; Hospitalization; National health insurance; Medical cost; Prevalence

Abstract

Background: Most of the previous epidemiologic studies on atopic dermatitis were based on the analysis of young patients excluding adults, and the target population was confined to a certain area. Korea has a national health insurance system, which covers the entire population and all medical facilities. Details of every medication, medical service, and diagnosis can be obtained in the Korean health insurance database.

Objectives: The goal of this study was to obtain recent statistics on atopic dermatitis in Korea.

Material and Methods: The Health Insurance Review and Assessment Service, a national medical database covering the entire Korean population, was analyzed. The prevalence, total cost, day of hospitalization, and the number of office visits during the most recent 5 years (2008–2012) were evaluated annually and compared.

Results: The 12-month prevalence of atopic dermatitis decreased from 2.27% in 2008 to 1.98% in 2012. The prevalence of atopic dermatitis also showed a gradual decrease from 2008 (12.23%) to 2012 (10.51%). The number of hospital-admitted patients for AD increased by 47.6%, however, the mean admission days per inpatient decreased from 8.08 in 2008 to 6.44. The overall costs related to atopic dermatitis remained unchanged.

Conclusions: The prevalence of atopic dermatitis is now decreasing in Korea.

Introduction

Atopic dermatitis (AD) is an itchy, chronic or chronically relapsing, inflammatory skin disease that is commonly associated with other atopic conditions such as asthma or allergic rhinitis in individuals or other family members. Although AD is a common condition, accurate assessment of its prevalence is complicated because of the different assessment methods used. The International Study of Asthma and Allergies in Childhood (ISAAC) is an representative epidemiologic study that uses cross-sectional questionnaires to assess children aged 6–7 years and 13–14 years in 56 centers throughout the world. The ISAAC program has allowed worldwide assessment of the prevalence of self-reported symptoms of asthma, allergic rhinoconjunctivitis, and atopic eczema in children using standard methods [1]. However, the use of self-reported questionnaires may have drawbacks such as validity problems.

Previous studies suggest that the prevalence of atopic diseases has increased substantially over recent years [2,3]. Several reports indicate that the increase has slowed or ceased, and some have even reported a decreasing prevalence [4,5]. Most of those earlier epidemiologic



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studies analyzed young patients, not adults, and the target population was confined to a certain area.

Korea has a national health insurance system, which covers the entire population and all medical facilities including hospitals, community clinics, public health centers, and even Chinese medicine clinics. Therefore, the Korean health insurance database includes details of every medication, medical service, and diagnosis. Almost all medical costs related to AD treatment, which include fee for outpatient consultation, hospitalization, procedure and medication, are covered by national health insurance. In this study, the authors conducted a retrospective analysis of a national database covering the entire Korean population. The study population comprised all national health-insured persons. The prevalence, total costs, days of hospitalization, and the number of office visits were evaluated annually and compared.

Materials and Methods

Data sources

The Health Insurance Review and Assessment Service (HIRA), organized in 1989, conducts reviews and assessment of medical fees in Korea. The reimbursement process starts with the health institution filing a claim with HIRA for medical fees. Accordingly, the HIRA database contains reimbursement records from all medical facilities. Since 2002, hospitals and clinics have been required to electronically file the patient-visit records to the HIRA, and such data are accessible to the public. The HIRA dataset includes information on age, sex, primary diagnosis (based on the International Classification of Diseases and Related Health Problems, ICD-10), all medical costs, duration of stay, and the number of outpatient visits. All medical costs related to AD including laboratory examinations, medications, and hospitalization are covered by National Health Insurance (NHI), and all associated records are saved in the HIRA databases. Therefore, we used the insurance claim records collected by the HIRA.

Study population

The Korean health insurance system is based on an obligatory NHI scheme, which requires all citizens to join the NHI scheme. Thus, the study population was defined as citizens who were subscribers to the NHI from 2008 through 2012. Annual claim records were aggregated. More than 99% of the estimated population was covered by NHI in 2012 (Table 1).

Patient selection

Patients were considered to have AD when a diagnostic code for AD was registered with HIRA. We identified insured persons who had at least one NHI claim record with a primary diagnosis of AD. The diagnostic codes of ICD-10 for AD (L20*) were included in the current study.

Estimation of prevalence and medical costs

The total number of individuals with health insurance was used as the denominator for estimating prevalence. In each year from 2008 to 2012, the number of insured persons very closely approximates the estimated population as previously mentioned. Therefore, we assumed that the prevalence of the insured was representative of the prevalence of the entire population in Korea. We also divided the age of the subjects into 10-year age categories. For each year, we calculated the age-specific prevalence of AD by dividing the total number of patients with AD by the total size of the population under NHI of that particular age based on the National Health Insurance Statistical Yearbook [6].

The medical cost of AD per patient was calculated by adding the costs of hospital visits, prescription costs, and cost of referrals to a dermatologist or laboratory. For general comparison, estimates of the medical costs were converted into US dollars.

Results

Prevalence

The 12-month prevalence of AD, obtained from a number of patients who received medical services at least once a year under the primary diagnosis of AD, decreased from 2.27% in 2008 to 1.98% in 2012. The denominator was the total number of insured individuals. Sex-specific prevalence was slightly higher in women than in men during 2008–2012 (Table 2). The age-specific prevalence curve is L-shaped, and the prevalence was highest in those in the first year (Figure 1). No significant difference is noted between two curves (2008 and 2012), except for a higher prevalence in the year 2008 curve. The prevalence of AD among 0-9 years of age showed a gradual decrease from 2008 (12.23%) to 2012 (10.51%) (Figure 2).

Medical service utilization

Both the total number of outpatients and the number of outpatient visits decreased in the most recent 5 years. The mean number of hospital visits per capita also decreased from 2.08 in 2008 to 2.01 in 2012. In contrast, the number of inpatients and total hospital admission days showed a remarkable increase. The number of hospital-admitted patients for AD increased by 47.6%, and the total number of hospital admission days for AD also increased by 17.6%. However, the mean admission days per inpatient decreased from 8.08 in 2008 to 6.44 in 2012 (Table 3).

Medical costs

Despite decreasing prevalence, the overall costs of AD remain unchanged. Medical costs for inpatients increased, whereas costs for outpatients slightly decreased. Annual costs per patient attributable to AD also did not change considerably. Total annual costs per patient showed only a slight increase, from 27,740 won (26.07\$) in 2008 to 30,970 won (29.11\$) in 2012 (Table 4).

Table 1: Comparison of estimated population and population under NHI (National Health Insurance).

	Male			Female			All		
	*Estimates of midyear Population	Population under NHI	Percentage covered by NHI(%)	*Estimates of midyear Population	Population under NHI	Percentage covered by NHI(%)	*Estimates of midyear Population	Population under NHI	Percentage covered by NHI(%)
2008	24576000	24296160	98.36	24373000	23863558	97.91	48949000	48159718	98.39
2009	24665000	24508172	99.36	24518000	24105362	98.32	49182000	48613534	98.84
2010	24758000	24648532	99.56	24653000	24258263	98.4	49410000	48909795	98.99
2011	24942000	24831251	99.56	24837000	24467914	98.51	49779000	49299165	99.04
2012	25040000	24986667	99.79	24965000	24675430	98.84	50004000	49662097	99.32

*Estimated using the cohort component method

Table 2: The number of atopic dermatitis patients and the year prevalence of atopic dermatitis in population under NHI (National Health Insurance), 2008-2012.

	Male		Female		All	
	*No. of Patients	Prevalence	*No. of Patients	Prevalence	*No. of Patients	Prevalence
2008	520231	2.14	574262	2.41	1094493	2.27
2009	498834	2.04	552913	2.29	1051747	2.16
2010	497918	2.02	551372	2.27	1049290	2.15
2011	479740	1.93	530787	2.17	1010527	2.05
2012	465826	1.86	515202	2.09	981028	1.98

*Patients who received medical services under the primary diagnosis of atopic dermatitis and registered electronically in NHI during the year.

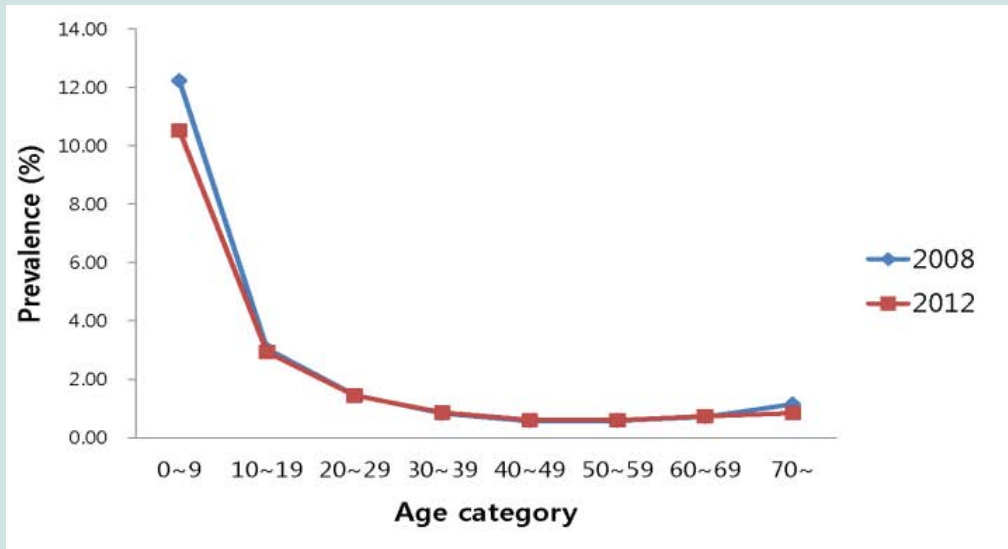


Figure 1: Age-specific prevalence of atopic dermatitis in Korea, in 2008 and 2012.

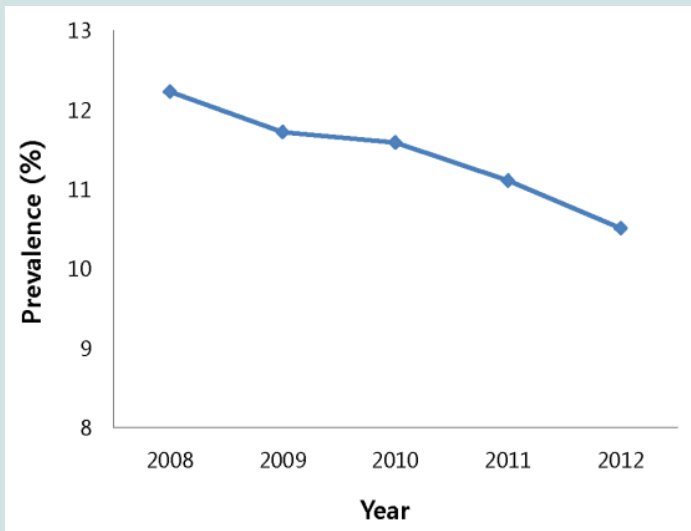


Figure 2: Comparison of the year prevalence of atopic dermatitis among patients 0-9 years of age in Korea.

Discussion

Our study is the nationwide survey including the entire Korean population. The results of our study indicate that the prevalence of AD in Korea is decreasing. Korea experienced a rapid increase of allergic disease during the past several decades with industrialization. The ISAAC study phase I and III results showed that the prevalence of eczema in Korea had increased during 1995–2000. The eczema prevalence in the 6–7 year age group increased from 8.8% in 1995 to 11.3% in 2000. The 13–14 year age group also showed an increased prevalence from 3.8% to 5.7% [2]. However, recent study results suggest that the trend has changed. The prevalence study performed in 2005 and 2008 showed that the overall prevalence of AD in Korea began to decrease from 2.33% in 2005 and 2.18% in 2008 [7]. The current study demonstrates that the prevalence continues to decrease; it was 2.17% in 2008 and 1.98% in 2012. This means the prevalence

of AD in Korea is decreasing in the most recent 10 years. Although the cause of the decrease is unclear, public education about AD might be beneficial. A high prevalence of AD revealed by a nationwide ISAAC study was brought to the Korean people’s attention. With the help of mass media and education offered by healthcare providers, parents became aware of the risks and protective factors of AD. The breastfeeding rate in Korea shows the effect of this education on Korean individuals. The rate for exclusive breastfeeding declined from 1994 to 2000; however, it increased thereafter and almost tripled in 2009 [8]. The protective effect of exclusive breastfeeding on allergic disease had been widely advertised and resulted in the change.

Despite the decreased prevalence, the number of hospital-admitted patients and total number of hospital admission days for AD showed a remarkable increase during 2008–2012. The increase in hospital admissions cannot be solely explained by an increase in

Table 3: Medical service utilization in Korea, 2008-2012.

Category of Services	Medical Service Utilization						
	Total in the Nation			per-capita*			
	2008	2012	Change rate	2008	2012	Change rate	
Outpatient	Visit number	2,277,656	1,971,184	86.5%	2.08	2.01	96.6%
	Number of patients	1,094,253	980,589	89.6%			
Inpatient	Hospital admission days	7,213	8,484	117.6%	8.08	6.44	79.7%
	Number of patients	893	1318	147.6%			

*Total medical service utilization or costs divided by the total number of atopic dermatitis in- and out-patients (n=893 and 1094253 in 2008, 1,318 and 980,589 in 2012)

Table 4: Insurance-covered medical costs of atopic dermatitis in Korea, 2008 and 2012.

Category of Services	Cost (1,000 won) [in USD]					
	Total in the Nation			per-capita*		
	2008	2012	Change rate	2008	2012	Change rate
Outpatient	29,809,511 [28,016,458]	29,495,056 [27,720,917]	98.9%	27.24 [25.60]	30.08 [28.27]	110.4%
Inpatient	550,724 [517,598]	890,226 [836,679]	161.6%	616.71 [579.61]	675.44 [634.81]	109.5%
Total	30,360,235 [28,534,055]	30,385,283 [28,557,597]	100.1%	27.74 [26.07]	30.97 [29.11]	111.6%

patients with severe AD. Mean hospital admission days per patient decreased during 2008–2012, and the total medical costs for AD showed only a modest increase. Increased sales of private medical expense insurance in Korea might have contributed to increased hospital admissions. In Korea, 40~100% of the whole medical cost is deductible with NHI and the rest of it is copayment. As private medical expense insurance covers up copayment, patients who also have private insurance can use medical service for virtually free, which leads to the increased medical service utilization. According to NHI data, the total number of hospital admission days for all diseases increased by 32% during 2008–2012. The total medical costs for all diseases per capita also rose by 34% during the 5 years. In comparison, the medical costs for AD showed a relatively small increase. Annual medical costs per patient increased by 11.6% during 2008–2012.

Our study has several limitations. Because our study is hospital-based, the results can differ from community-based data. Our study can reflect only insured medical costs for AD. However, with this study we could survey the overall trend of AD in the entire Korean population. Our study shows that the prevalence of AD in Korea is decreasing.

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