

Prevalence of asthma and atopic dermatitis in children with special emphasis on birth order

DOI:10.1111/j.1399-3038.2012.01314.x

To the Editor,

Recently, Kusunoki et al. (1) investigated the prevalence of allergic disease with a special emphasis on birth order. They concluded that there is a significant birth order effect on food allergy, but bronchial asthma and atopic dermatitis did not related to birth order for school children aged 7–15 years. They compiled the data, and adjustment for age, gender, family history of allergy, and other information value was made to conduct logistic regression analysis.

The author previously reported the prevalence of asthma using a standard questionnaire in Japanese children aged 3 years or younger (2). Thereafter, prevalence of asthma on special emphasis on aging and gender was discussed (3). Parents of the target population completed questionnaires on allergic diseases. Each local government agreed to the study protocol, and the Committee on Human Health Survey in Gunma Prefecture approved this study. Informed consent was obtained from all the families of the subjects. The response rate was 70.7% (17,402/24,631). A positive answer to all six questions of the American Thoracic Society-Division of Lung Disease (ATS-DLD) questionnaire three categorized the subject as having asthma. The question, 'Has your child been diagnosed as having atopic dermatitis?' was applied to identify atopic dermatitis. The prevalence of asthma and atopic dermatitis was calculated by stratification of birth order, and then, the Cochran–Armitage test for trends was applied. Furthermore, logistic regression analysis was adopted to adjust to the other risk factors for asthma and atopic dermatitis, respectively.

The prevalence of asthma in the 1st, 2nd, and 3rd or later birth order was 1.7 (72/4303), 3.4 (110/3190), and 3.9 (42/1082) in boys and 0.7 (31/4208), 1.5 (49/3162), and 2.4 (27/1129) in girls. The prevalence of atopic dermatitis in the 1st, 2nd, and 3rd or later birth order was 5.0 (197/3903), 6.7 (191/2862), and 6.2 (60/971) in boys and 3.6 (139/3820), 3.9 (113/2883), and 4.5 (45/1008) in girls. There was a significant increasing trend of the prevalence of asthma in both gender ($p < 0.001$) and atopic dermatitis in boys ($p < 0.05$).

By logistic regression analyses, it was found that birth order, male gender, increasing age and family history of

Table 1 Odds ratios and 95% confidence interval for asthma or atopic dermatitis

	Odds ratio	95% CI	p Value
Variables for asthma			
1st born (control)			
2nd born	2.14	1.65–2.77	<0.001
3rd or later born	2.68	1.95–3.69	<0.001
Girl (against boy)	0.47	0.37–0.60	<0.001
Age (1 year increase)	1.91	1.73–2.11	<0.001
Family history of allergy	2.86	2.02–4.04	<0.001
Variables for atopic dermatitis			
1st born (control)			
2nd born	1.21	1.03–1.43	<0.05
3rd or later born	1.21	0.96–1.51	ns
Girl (against boy)	0.64	0.55–0.75	<0.001
Age (1 year increase)	1.10	1.03–1.17	<0.01
Family history of allergy	4.63	3.55–6.03	<0.001

CI, confidence interval; ns, not significant.

allergy significantly contributed to an increase in the risk of asthma (Table 1). Except for the 3rd or later born for atopic dermatitis, odds ratio of 1st birth for asthma or atopic dermatitis significantly decreased.

Compared with data presented by Kusunoki et al. (1), risk of 1st birth for asthma or atopic dermatitis was different in this study. Dissociation might be derived from the difference in age. Although Kusunoki et al. concluded that the birth order effect was not observed for the prevalence of asthma or atopic dermatitis. I suppose that there is a different effect of birth effect on much younger generation. Further study is needed to conduct simultaneous survey on subjects from infant to high school student on the effect of birth order effect on asthma or atopic dermatitis.

Tomoyuki Kawada

Department of Hygiene and Public Health, Nippon Medical School,
Tokyo, Japan.

E-mail: kawada@nms.ac.jp

References

1. Kusunoki T, Mukaida K, Morimoto T, et al. Birth order effect on childhood food allergy. *Pediatr Allergy Immunol* 2012; **23**: 250–4.
2. Kawada T. Risk factors and prevalence of asthma or atopic dermatitis in young children by a questionnaire survey. *J Nippon Med Sch* 2004; **71**: 167–71.
3. Kawada T. Prevalence of asthma in young children. *J Allergy Clin Immunol* 2011; **128**: 432–3.