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**Title:** Distinct phenotypic and pathophysiologic features of elderly asthma

Min-gyu 895 Kang irreversibly@gmail.com MD <sup>1,2</sup>, Woo-jung 1120 Song swj0126@paran.com MD <sup>1,2</sup>, Seung-Eun 1121 Lee crisisle@hanmail.net MD <sup>1,2</sup>, So-Hee 1122 Lee lshsophia@hanmail.net MD <sup>1,2</sup>, Kyung-Up 1123 Min drmin@snu.ac.kr MD <sup>1,2</sup> and Sang-Heon 1124 Cho shcho@plaza.snu.ac.kr MD <sup>1,2</sup>. <sup>1</sup> Internal Medicine, Seoul National University Hospital, Seoul, Korea, 110-744 and <sup>2</sup> Allergy and Clinical Immunology, Seoul National University Medical Research Center, Seoul, Korea, 110-744 .

**Body:** Background: Recent epidemiologic evidence suggests that asthma is prevalent in the elderly population. Majority of elderly asthma develops in later life, and thus is considered patho-physiologically distinct from young adult asthma. Objective: To investigate whether elderly asthmatics may have different phenotypic or pathophysiologic features from young adult asthmatics Methods: Young adult (18-45 years) and elderly ( $\geq 65$  years) non-smoking, treatment-naive asthmatics were compared cross-sectionally. Asthma was defined if they had typical symptoms and methacholine PC20  $\leq 8$  mg /mL. They completed baseline spirometry, induced sputum analyses, inhalant allergen skin prick tests, and anthropometric measurements. As indices of small airway involvements, a FEF25-75% and FEF25-75/FVC were used. Results: A total of 103 young adult (mean age: 29.9 year) and 120 elderly (mean age: 71.1 year) asthmatics were included. Two age groups had similar degrees of airway hyperresponsiveness (methacholine PC20;  $2.7 \pm 2.2$  mg/mL in the elderly vs.  $2.7 \pm 2.5$  mg/mL in young adults). They also did not differ in gender distribution, FVC%, or FEV1%. However, the elderly asthmatics had higher body mass index ( $24.9$  kg/m<sup>2</sup> vs.  $23.3$  kg/m<sup>2</sup>,  $P < 0.05$ ), and lower atopy prevalence ( $40.0\%$  vs.  $95.5\%$ ,  $P < 0.001$ ), and slightly lower sputum eosinophils ( $7.1\%$  vs.  $10.3\%$ ,  $P < 0.1$ ) than young adult asthmatics. In addition, the elderly had significantly reduced FEF25-75% ( $43.1\%$  vs.  $61.6\%$ ) and FEF25-75/FVC ( $0.52$  vs.  $0.72$ ) than the younger subjects at baseline (all  $P < 0.001$ ). Conclusions: Elderly asthmatics had different phenotypic and pathophysiologic features from young adult asthmatics, suggesting their distinct pathogenic mechanisms and therapeutic considerations.