

Dear Editor

Examination of Patients Whose Eosinophilic Ratio in Sputum Was More than 3% with Wheeze or Cough Symptoms

Bronchial asthma (BA) is defined as a chronic allergic airway inflammatory disease.¹ Sputum eosinophilia ($\geq 3\%$ eosinophils) is an important indicator of allergic inflammation of the respiratory tract, and untreated cases of BA and cough-variant asthma (CVA) usually show eosinophilia in sputum.

This study determined the eosinophilic ratio of sputum for patients with/wheeze or cough symptoms and distinguished patients showing sputum eosino-

philia. The significance of detecting eosinophils in sputum was also examined.

Subjects comprised 96 outpatients (47 men, 49 women; mean age, 44 years; age range, 23-77 years) with sputum eosinophilic ratio $\geq 3\%$ among outpatients who had complained of wheeze or cough symptoms for various duration less than 8 weeks in the preceding 2 years.

Patients with pneumonia according to chest X-ray were excluded.

We attempted to induce sputum production by 5% or/and 10% hypertonic saline (NaCl) inhalation for 15 minutes and investigated the eosinophilic ratio of sputum in patients from whom sputum was obtained.^{2,3} Sputum eosinophilic ratio was $\geq 3\%$ in 96 outpatients, and diagnoses were made based on various examinations (particularly blood data, sputum culture, chest

Table 1 Findings in 29 patients with atypical infection

No.	Age (Years)	Sex (Male/Female)	Smoking history	Ratio in sputum	Lymphocyte (%)	Eosinophil (%)	Other (%)	Allergic rhinitis	Diagnosis
			B.I (Current/Ex)	Neutrophil (%)				Merger/Non	
1	46	M	20P/26Y (C)	68	27	3	2	M	Virus
2	68	F	N	41	55	4	0	M	CM
3	61	F	N	81	2	8	9	M	WC
4	37	M	20P/16Y (E)	26	22	6	46	N	Virus
5	60	F	10P/10Y (E)	27	26	21	25	M	Virus
6	65	M	N	13	54	9	24	M	Virus
7	64	M	40P/40Y (E)	16	73	11	0	N	Virus, IP
8	28	M	N	80	16	4	0	M	MP
9	77	M	Unclear	12	69	14	5	N	Virus
10	36	M	N	16	67	11	6	M	MP
11	45	F	N	19	60	19	2	M	MP
12	50	F	N	6	75	11	8	N	WC
13	41	F	N	39	21	22	18	M	Virus
14	29	M	N	20	54	24	2	M	Virus
15	29	M	N	31	61	8	0	N	Virus
16	26	M	20P/6Y (C)	58	8	4	30	N	Virus
17	44	F	N	21	72	7	0	N	Virus
18	70	F	N	6	81	12	1	N	CM
19	35	F	N	65	29	6	0	M	Virus
20	34	M	Unclear	19	69	12	0	M	Virus
21	30	M	Unclear	31	43	24	2	M	Virus
22	30	F	N	16	71	6	7	M	Virus
23	32	M	10P/11Y (C)	83	6	8	3	M	MP
24	54	M	6P/34Y (C)	23	65	11	0	N	MP
25	48	M	N	32	62	4	2	N	MP
26	27	F	N	12	69	5	14	M	Virus
27	27	M	N	8	75	17	0	M	Virus
28	30	F	N	47	33	17	3	N	Virus
29	37	F	N	20	76	4	0	N	MP

CM, chlamydia; WC, whooping cough (pertussis); MP, mycoplasma; IP, interstitial pneumonia.

Table 2 Findings in 6 patients with other diseases

No.	Age (Years)	Sex (Male/ Female)	Smoking history	Ratio in sputum	Lymphocyte (%)	Eosinophil (%)	Other (%)	Allergic rhinitis	Diagnosis
			B.I (Current/Ex)	Neutrophil (%)				Merger/ Non	
1	32	F	N	34	29	32	5	M	AC
2	53	F	N	6	7	82	5	M	AC
3	59	F	20P/39Y (C)	46	5	49	0	M	Sinusitis
4	70	F	N	50	5	6	39	N	Sinusitis
5	72	M	15P/50Y (C)	10	4	8	78	M	CB
6	45	M	N	2	16	74	8	M	AB

AC, Atopic cough; CB, Chronic bronchitis (COPD); AB, Acute bacterial bronchitis.

X-ray, pulmonary function test, and broncho-hypersensitivity challenge, etc.) in these 96 outpatients. In addition, we classified these subjects into several diseases and examined cell fractionation as same as eosinophil in sputum of them.

In results based on various examinations, 61 patients were diagnosed with either BA or CVA (M 29, F 32). In the remaining patients, diagnosis was atopic cough in 2, chronic sinusitis in 2, chronic bronchitis in 1, atypical infection in 29 (virus, mycoplasma, chlamydia, or pertussis) and bacterial bronchitis in 1. Increased lymphocytes with eosinophils were observed in the sputum of many patients with atypical infection (Table 1). Eosinophils were also increased in patients with atopic cough, chronic sinusitis, chronic bronchitis, or bacterial bronchitis (Table 2).

Confirmation of eosinophilia in sputum is very useful for early diagnosis of BA or CVA. However, eosinophils are also increased in sputum with other pathologies, including atypical infection or chronic sinusitis etc. Sputum eosinophils may increase with lymphocytes in pulmonary tuberculosis⁴ and atypical infections like Mycoplasma⁵; therefore, checking other cell ratios (neutrophils and lymphocytes at a minimum) is very important. Various diseases with wheeze and cough symptoms should be distinguished by cell fractionation in sputum.⁶ Use of inhaled corticosteroids as a first-line treatment based solely on an observation of eosinophilia in sputum

may not recommend.

Naoto Watanabe¹ and Sohei Makino¹

¹Tokyo Allergy and Respiratory Disease Research Institute, Tokyo, Japan

Email: drnaotow@jiu.ac.jp

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