

Table S1 Changes in sleep/awake cough counts measured by artificial intelligence (AI) and human through the study period

Cough counts (total)	Study period						
	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7
AI (/sleep time)	58 (20, 104.5)	52 (7.5, 105)	49 (14.8, 76.5)	23.5 (0, 80)	12 (1.3, 37.8)**	17 (0, 100)*	11 (3.8, 46.8)***
Human (/sleep time)	68 (27, 130.5)	47.5 (6.3, 105)	45 (26.5, 76.8)	22.5 (0.3, 80.3)	18.5 (2.3, 42.3)**	21 (0, 107)	12 (3.75, 46.5)***
AI (/awake time)	51.5 (24.8, 122)	40 (17.8, 132)**	26.5 (14.5, 55.8)**	18 (7.3, 38.5)**	21.5 (5, 52)**	14 (8, 62)**	8 (2.5, 28)**
Human (/awake time)	61 (18.8, 109.8)	35 (15.8, 130.3)*	24 (13.3, 57.8)**	19 (6.5, 49.8)**	18.5 (7, 63.3)**	12 (4, 59)**	12 (3.8, 46.5)**

Data are presented as median (interquartile ranges). *P<0.05, **P<0.01, ***P<0.001 compared to Day 1 using paired Wilcoxon signed rank test.

Table S2 Changes in sleep/awake cough counts per hour measured by artificial intelligence (AI) and human through the study period

Cough counts (per hour)	Study period						
	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7
AI (/sleep time)	12.3 (5.1, 24.1)	14.1 (8.6, 30.4)	9.8 (4.6, 15.6)	8.6 (1.0, 25.5)	3.8 (1.2, 7.9)**	4 (0.4, 27.6)	2.2 (0.8, 9.4)***
Human (/sleep time)	14.5 (6.0, 28.9)	14.3 (7.4, 36.4)	9.4 (5.6, 15.6)	7.7 (1.1, 25.4)	4.7 (1.2, 8.9)**	4.2 (0.4, 27.6)	2.4 (0.8, 9.3)***
AI (/awake time)	25.8 (12.4, 61.0)	20.0 (10.0, 74.0)	13.3 (7.3, 27.9)**	9.0 (3.7, 19.3)**	11.5 (2.5, 26.0)**	7.0 (4.0, 31)**	3.8 (0.8, 13.5)**
Human (/awake time)	30.5 (9.4, 54.9)	18.5 (9.0, 73.5)	12.0 (6.6, 28.9)**	9.5 (3.3, 24.9)**	10.0 (3.5, 32.0)**	6 (2.0, 29.5)**	3.3 (2.0, 10.1)*

Data are presented as median (interquartile ranges). *P<0.05, **P<0.01, ***P<0.001 compared to Day 1 using paired Wilcoxon signed rank test.

Table S3 Changes in CS-VAS, the frequency of wake up and salbutamol use, the degree of activity limitation, and morning and evening PEFR through the study period

Variables	Study period						
	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7
CS-VAS	5 (3, 7)	5 (3, 6)	5 (2.25, 6.75)*	5 (2.25, 6)*	5 (2.25, 6)*	5 (2.25, 5.75)*	3 (1.5, 5)**
Wake up	1 (0, 2.75)	1 (0, 2)	0 (0, 1.75)	0 (0, 1)	0 (0, 0.75)*	0 (0, 1)*	0 (0, 1)*
Salbutamol use (/sleep time)	0.5 (0, 2)	0.5 (0, 2)	1 (0, 1.75)	1 (0, 2)	1 (0, 1.75)	0 (0, 2)	0 (0, 1)
Salbutamol use (/awake time)	2 (1, 4)	2 (1, 3.75)	2 (2, 4)	2 (1.25, 4)	2 (0.25, 4)	2 (0, 3.5)	2 (0, 2.75)
Activity limitation [†] (/awake time)	1 (1, 2)	1 (0, 2)	1 (1, 1)*	0 (0, 1.75)**	1 (0, 1.75)*	1 (0, 1)**	1 (0, 1)**
AM PEFR, %best [‡]	81.0 (69.8, 90.1)	85.0 (66.2, 94.3)	89.4 (77.1, 97.1)**	88.6 (82.6, 95.5)**	85.7 (82.2, 96.1)*	88.9 (81.4, 95.0)**	91.0 (87.2, 96.0)**
PM PEFR, %best [‡]	77.4 (62.6, 88.9)	82.6 (69.8, 97.6)*	87.7 (75.7, 96.5)**	88.8 (78.6, 99.5)***	91.9 (84.2, 96.2)**	90.2 (87.2, 96.4)**	91.5 (87.5, 99.2)**

Data are presented as median (interquartile ranges). *P<0.05, **P<0.01, ***P<0.001 compared to Day 1 using paired Wilcoxon signed rank test. [†]The degree of activity limitation consists of 0 (not at all), 1 (a little), 2 (moderately), 3 (quite a bit), and 4 (extremely). [‡]The percent of the best values measured during study period in each subject. CS-VAS, cough symptom visual analogue scale ranging from 0 cm (not at all) to 10 cm (extremely); PEFR, peak expiratory flow rate.

Table S4 Changes in the degree of asthma-related symptoms including cough, wheezing, dyspnea, and chest tightness through the study period

Variables	Study period						
	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7
Sleep time							
Cough							
Grade 0	0 (0.0)	1 (4.2)	0 (0.0)	5 (20.8)	7 (29.3)	4 (16.7)	4 (16.7)
Grade 1	14 (58.3)	12 (50.0)	13 (54.2)	12 (50.0)	12 (50.0)	15 (62.5)	13 (54.2)
Grade 2	7 (29.2)	7 (29.2)	9 (37.5)	6 (25.0)	4 (16.7)	3 (12.5)	3 (12.5)
Grade 3	2 (8.3)	2 (8.3)	2 (8.3)	1 (4.2)	0 (0.0)	1 (4.2)	1 (4.2)
Grade 4	1 (4.2)	1 (4.2)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Wheezing							
Grade 0	6 (25.0)	5 (20.8)	8 (33.3)	9 (37.5)	0 (37.5)	12 (50.0)	11 (45.8)
Grade 1	12 (50.0)	14 (58.3)	12 (50.0)	11 (45.8)	12 (50.0)	8 (33.3)	7 (29.2)
Grade 2	4 (16.7)	2 (8.3)	2 (8.3)	3 (12.5)	2 (8.3)	3 (12.5)	2 (8.3)
Grade 3	2 (8.3)	1 (4.2)	2 (8.3)	1 (4.2)	0 (0.0)	0 (0.0)	0 (0.0)
Grade 4	0 (0.0)	1 (4.2)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Dyspnea							
Grade 0	7 (29.2)	8 (33.3)	12 (50.0)	13 (54.2)	13 (54.2)	14 (58.3)	12 (50.0)
Grade 1	15 (62.5)	11 (45.8)	9 (37.5)	9 (37.5)	8 (33.3)	7 (29.2)	7 (29.2)
Grade 2	1 (4.2)	4 (16.7)	2 (8.3)	1 (4.2)	2 (8.3)	2 (8.3)	1 (4.2)
Grade 3	1 (4.2)	0 (0.0)	1 (4.2)	1 (4.2)	0 (0.0)	0 (0.0)	0 (0.0)
Grade 4	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Chest tightness							
Grade 0	6 (25.0)	5 (20.8)	9 (37.5)	9 (37.5)	11 (45.8)	11 (45.8)	8 (33.3)
Grade 1	13 (54.2)	13 (54.2)	12 (50.0)	12 (50.0)	12 (50.0)	9 (37.5)	11 (45.8)
Grade 2	3 (12.5)	3 (12.5)	2 (8.3)	2 (8.3)	0 (0.0)	3 (12.5)	1 (4.2)
Grade 3	2 (8.3)	2 (8.3)	1 (4.2)	1 (4.2)	0 (0.0)	0 (0.0)	0 (0.0)
Grade 4	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Awake time							
Cough							
Grade 0	0 (0.0)	0 (0.0)	2 (8.3)	1 (4.2)	3 (12.5)	5 (20.8)	4 (16.7)
Grade 1	4 (16.7)	13 (54.2)	12 (50.0)	13 (54.2)	12 (50.0)	12 (50.0)	13 (54.2)
Grade 2	16 (66.7)	9 (37.5)	8 (33.3)	10 (41.7)	8 (33.3)	6 (25.0)	5 (20.8)
Grade 3	1 (4.2)	1 (4.2)	2 (8.3)	0 (0.0)	1 (4.2)	1 (4.2)	1 (4.2)
Grade 4	3 (12.5)	1 (4.2)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	1 (4.2)
Wheezing							
Grade 0	5 (20.8)	5 (20.8)	7 (29.2)	9 (37.5)	10 (41.7)	8 (33.3)	12 (50.0)
Grade 1	7 (29.2)	14 (58.3)	13 (54.2)	9 (37.5)	10 (41.7)	13 (54.2)	9 (37.5)
Grade 2	9 (37.5)	1 (4.2)	3 (12.5)	4 (16.7)	2 (8.3)	1 (4.2)	2 (8.3)
Grade 3	1 (4.2)	2 (8.3)	1 (4.2)	2 (8.3)	2 (8.3)	2 (8.3)	0 (0.0)
Grade 4	2 (8.3)	2 (8.3)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	1 (4.2)
Dyspnea							
Grade 0	5 (20.8)	10 (41.7)	8 (33.3)	11 (45.8)	12 (50.0)	12 (50.0)	13 (54.2)
Grade 1	12 (50.0)	10 (41.7)	12 (50.0)	8 (33.3)	7 (29.2)	9 (37.5)	8 (33.3)
Grade 2	4 (16.7)	3 (12.5)	3 (12.5)	3 (12.5)	5 (20.8)	3 (12.5)	3 (12.5)
Grade 3	1 (4.2)	1 (4.2)	1 (4.2)	2 (8.3)	0 (0.0)	0 (0.0)	0 (0.0)
Grade 4	2 (8.3)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Chest tightness							
Grade 0	5 (20.8)	7 (29.2)	7 (29.2)	7 (29.2)	9 (37.5)	10 (41.7)	12 (50.0)
Grade 1	13 (54.2)	12 (50.0)	12 (50.0)	13 (54.2)	12 (50.0)	11 (45.8)	9 (37.5)
Grade 2	3 (12.5)	3 (12.5)	4 (16.7)	2 (8.3)	2 (8.3)	3 (12.5)	2 (8.3)
Grade 3	2 (8.3)	2 (8.3)	1 (4.2)	2 (8.3)	1 (4.2)	0 (0.0)	1 (4.2)
Grade 4	1 (4.2)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)

Data are presented as frequency (percent). The degree of asthma-related symptoms consists of 0 (not at all), 1 (mild), 2 (moderate), 3 (severe), and 4 (very severe).