

기침설문의 활용

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기침설문의 활용

기침설문과 병태생리의 이해

표 9. 숫자평정척도(Nurmeric rating scale : NRS)

현재 기침의 심한 정도를 0~10 사이의 숫자 중 하나에 표시해 주십시오



Tools for assessing cough

- **Severity** – VAS/NRS
- **Frequency**
 - Leicester Cough Monitor/VitaloJAK: important in drug development
 - Difficult to apply in clinical practice
 - Sometimes distinct from patients' perspective
- **Intensity**
 - Objectively measured with sound
 - Physiologically measured: cough flow, EMG, esophageal pressure
- **Cough reflex sensitivity**

Leicester Cough Monitor

- Ambulatory
- Measure cough frequency in patients' own environment
- MP3 recording device and a lapel microphone
- Automatically count using speech recognition software
- Detects cough event occurring in isolation or in a bout

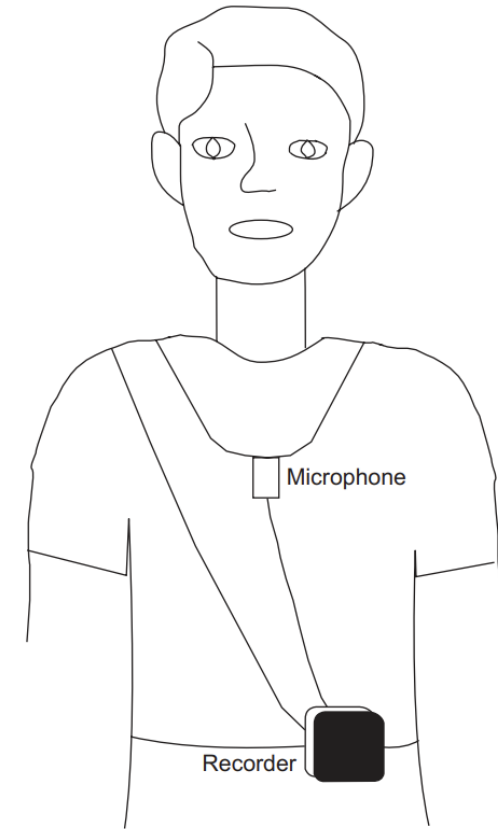


FIGURE 1. The Leicester Cough Monitor.

VitaloJAK



- MP3 recording device
- Contact and lapel microphone
- Remove non-cough data by algorithm
- Counted by trained technician from condensed recording

Cough reflex sensitivity test

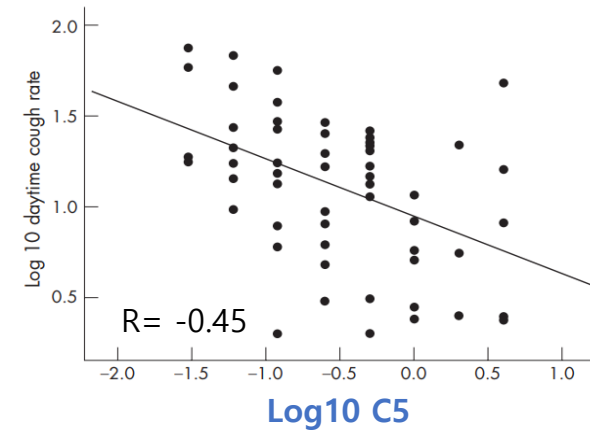
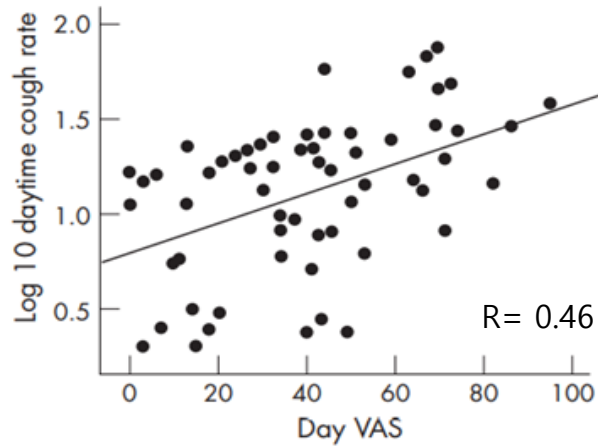


Figure 2 Correlation between cough reflex sensitivity and daytime cough rates.

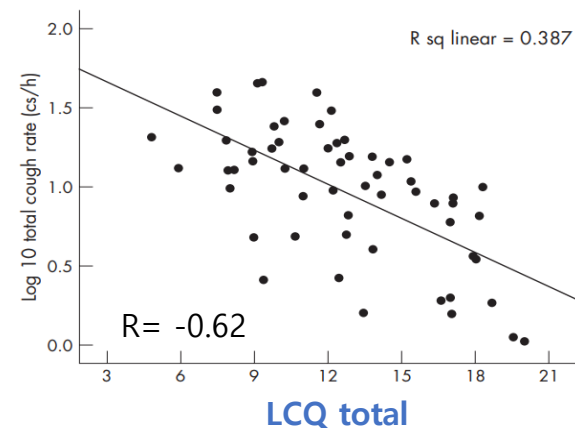


Figure 4 Correlation between total cough rates and total Leicester Cough Questionnaire (LCQ) Score.

Table 3 Correlations between objective and subjective measures of cough in patients with chronic cough

	Log total time spent coughing	Log daytime spent coughing	Log night-time spent coughing
Cough score			
Day	NA	$r=0.50$ $p \leq 0.001$	NA
Night	NA	NA	$r=0.55$ $p \leq 0.001^*$
VAS			
Day	NA	$r=0.46$ $p \leq 0.001$	NA
Night	NA	NA	$r=0.61^*$ $p \leq 0.001$
Log ₁₀ C5			
Day	NA	$r=-0.45$ $p \leq 0.001$	NA
LCQ			
Total	$r=-0.62$ $p \leq 0.001$	$r=-0.54$ $p \leq 0.001$	$r=-0.39$ $p=0.002$
Physical	$r=-0.55$ $p \leq 0.001$	$r=-0.43$ $p \leq 0.001$	$r=-0.53$ $p \leq 0.001$
Psychological	$r=-0.59$ $p \leq 0.001$	$r=-0.54$ $p \leq 0.001$	$r=-0.33$ $p=0.012$
Social	$r=-0.55$ $p \leq 0.001$	$r=-0.49$ $p \leq 0.001$	$r=-0.26$ $p=0.053$

Cough reflex sensitivity test

TABLE 3. OBJECTIVE AND SUBJECTIVE COUGH DATA COLLECTED FROM COPD CURRENT SMOKERS, COPD EX-SMOKERS, HEALTHY SMOKERS, AND HEALTHY NONSMOKERS

	COPD CS	COPD CEx	HS	HNS	P Value
Objective 24-hr cough rate (range), coughs/h*					
Total	9.0 (0.4–83.1)	4.9 (0.60–27)	5.3 (0.20–13.9)	0.7 (0.13–4.3)	<0.001 [†]
Day	12.3 (0.4–130.2)	6.5 (0.8–28.6)	8.0 (0.3–18.8)	1.3 (0.1–6.3)	<0.001 [‡]
Night	2.4 (0.0–17.6)	1.4 (0.0–47.8)	0.7 (0.0–5.5)	0 (0.0–0.8)	<0.001 [§]
Capsaicin cough challenge (SD)					
Log C5	1.08 (±0.49)	1.12 (±0.54)	1.27 (±0.45)	1.37 (±0.42)	0.479
Log C2	0.83 (±0.62)	0.77 (±0.49)	0.94 (±0.31)	1.02 (±0.42)	0.249
VAS, mm (range)*					
Day	45 (15–90)	23 (2–84)	17.5 (2–50)	3.5 (0–9)	<0.001 [†]
Night	23.5 (0–82)	15.5 (0–81)	10.5 (1–57)	2 (0–5)	<0.001 [¶]
Cough score (range)*					
Day	3 (0–4)	2 (0–4)	1.5 (0–3)	0.5 (0–1)	<0.001 [†]
Night	1 (0–4)	1 (0–4)	1 (0–3)	0 (0–1)	<0.002 [¶]
LCQ (range)*	16.8 (10.3–20.6)	18.7 (10.5–21)	20.1 (16.8–20.6)	20.9 (19.6–21)	<0.001 ^{**}

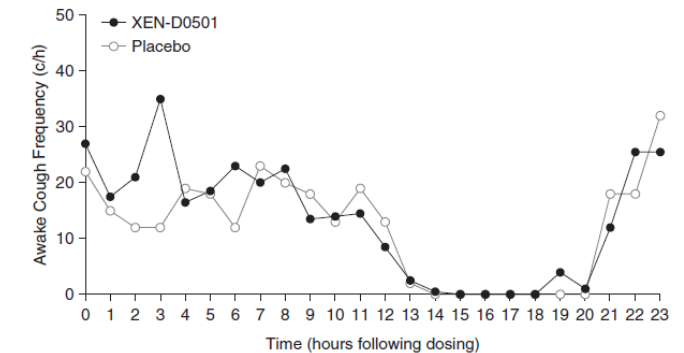
Definition of abbreviations: CEx = ex-smoker; COPD = chronic obstructive pulmonary disease; CS = current smoker; HNS = healthy nonsmoker; HS = healthy smoker;

XEN-D0501, a Novel Transient Receptor Potential Potential Vanilloid 1 Antagonist, Does Not Reduce Cough in Patients with Refractory Cough

SB-705498 vs. XEN-D0501

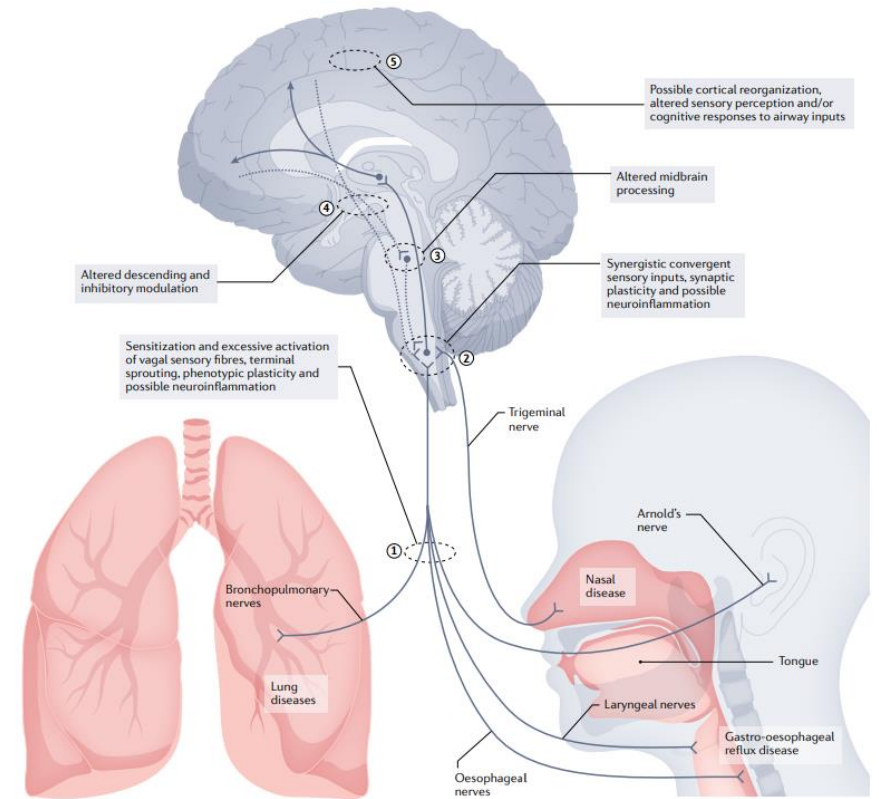
Table 2. Measures of Cough at Baseline and after 2 Weeks of Treatment with XEN-0501 or Matched Placebo

	XEN-D0501 (n = 18)		Placebo (n = 19)		P Value
	Baseline	Day 14	Baseline	Day 14	
Objective cough frequency, coughs/h					
Awake	34.4 (41.9)	41.1 (52.7)	40.9 (63.2)	41.3 (58.3)	0.42
24 h	24.2 (29.0)	29.5 (36.8)	29.2 (46.0)	30.5 (44.0)	0.43
Night, median (IQR)	0.7 (0.3–2.3)	1.7 (0.8–4.5)	2.3 (0.9–3.3)	1.4 (0.7–4.4)	0.29
Cough severity VAS, mm					
Day	40.6 (26.6)	39.7 (32.5)	34.3 (23.0)	31.5 (27.8)	0.03
Night	21.9 (25.8)	16.4 (22.3)	20.2 (17.5)	14.7 (18.2)	0.12
Urge to cough VAS, mm					
Day	42.9 (26.2)	34.6 (30.9)	31.1 (21.5)	27.2 (25.3)	0.25
Night	22.2 (23.8)	16.3 (24.3)	18.4 (17.0)	14.6 (22.5)	0.58
Cough quality of life (LCQ)	13.05 (4.09)	13.80 (4.03)	13.70 (4.53)	14.43 (4.43)	0.82
Capsaicin challenge					
E _{max} , coughs	32.3 (17.1)	13.1 (11.3)	27.7 (15.2)	25.9 (12.3)	<0.001



Tools for assessing cough

- **Quality of life** – reflecting patients' perspective directly
 - Cough Symptom Score (CSS)
 - Cough-specific Quality of Life Questionnaire (CQLQ)
 - Leicester Cough Questionnaire (LCQ)
 - Simplified COugh Assessment Test (COAT)



Cough Symptom Score

표 11. 기침증상점수(Cough Symptom Score, CSS)

• 낮에 기침을 얼마나 하시나요?

① 낮에 기침 **없음**

② 낮에 **잠깐** 동안의 기침이 **한 번** 정도

③ 낮에 **잠깐** 동안의 기침이 **두 번 이상**

④ 낮에 기침이 **자주** 있지만 일상 **생활에 지장을 주지는 않음**

⑤ 낮에 **잦은** 기침으로 일상 **생활에 지장이 있음**

⑥ 낮에 거의 **종일** 매우 **심하게** 기침함

• 밤에 기침을 얼마나 하시나요?

① 밤에 기침 **없음**

② 밤에 **깨어 있을 때만** 기침, 자면 **괜찮음**

③ 밤에 기침으로 **한번 정도 자다가 깨거나** 일찍 일어남

④ 밤에 기침으로 **자주 잠을 깬**

⑤ 거의 **밤새** 기침함

⑥ 거의 밤새 **잠을 잘 수 없도록 심하게** 기침함

Leicester Cough Questionnaire (LCQ)

-
1. Have you had chest or stomach pains as a result of a cough? **Physical**
 2. Have you been bothered by phlegm production when you cough? **Physical**
 3. Have you been tired because of a cough? **Physical**
 4. Have you had any coughing you've felt you could not control? **Psychological**
 5. Have you been embarrassed as a result of coughing? **Psychological**
 6. Have you felt anxious because of a cough? **Psychological**
 7. Has a cough interfered with your job or other daily tasks? **Social**
 8. Has a cough interfered with your overall enjoyment in life? **Social**
 9. Has exposure to paint or fumes caused you to cough? **Physical**
 10. Has your sleep been disturbed by coughing? **Physical**
 11. How many times per day have you had coughing bouts? **Physical**
 12. Has coughing made you feel frustrated? **Psychological**
 13. Have you felt fed up because of coughing? **Psychological**
 14. Have you suffered from a hoarse voice due to coughing? **Physical**
 15. Have you had a lot of energy? **Physical**
 16. Have you worried that your cough may indicate a serious illness? **Psychological**
 17. Have you been concerned that other people think something is wrong with you because of your coughing? **Psychological**
 18. Has a cough interrupted conversations or telephone calls? **Social**
 19. Has a cough annoyed your partner, family, or friends? **Social**
-

Physical		1-7
1	chest/stomach pain	
2	bothersome phlegm	
3	tiredness	
9	hypersensitivity to irritants	
10	sleep disturbance	
11	coughing bout frequency	
14	voice hoarseness	
15	loss of energy	
Psychological		1-7
4	feeling in cough out of control	
5	embarrassment	
6	anxiety	
12	frustration	
13	feeling of fed-up	
16	worries about serious illness	
17	concern other people's thought	
Social		1-7
7	job/daily activity interference	
8	overall life enjoyment interference	
18	interruption of conversation/phone call	
19	annoyance to partner/friend/family	

3-21

이 설문지는 당신 삶의 다양한 측면에 대한 기침의 영향을 평가하기 위한 것입니다. 각 질문을 주의 깊게 읽고 기침에 가장 해당되는 답을 표시하십시오. 모든 질문에 대해 동일한 답을 표시하십시오.

11. 지난 2주 동안, '기침이 발작적으로 계속 나오는 경우'가 하루에 몇 번이나 있었습니까?
없음

1. 지난 2주 동안, 기침으로 인해 가슴통증이나 복통을 느낀 적이 있습니까?

- ① 항상 ② 대부분 시간 ③ 상당한 시간 ④ 때때로 ⑤ 약간 ⑥ 거의 없음 ⑦ 전혀 없음

2. 지난 2주 동안, 기침할 때 가래 때문에 불편했습니까?
① 항상 ② 대부분 ③ 여러 번 ④ 때때로 ⑤ 드물게 ⑥ 거의 없음 ⑦ 전혀 없음

3. 지난 2주 동안, 기침 때문에 피곤을 느꼈습니까?
① 항상 ② 대부분 시간 ③ 상당한 시간 ④ 때때로 ⑤ 약간 ⑥ 거의 없음 ⑦ 전혀 없음

4. 지난 2주 동안, 당신이 기침을 조절할 수 있다고 느꼈습니까?
① 전혀 안됨 ② 거의 안됨 ③ 약간 조절 ④ 때때로 조절 ⑤ 상당히 조절 ⑥ 대부분 조절 ⑦ 항상 조절됨

5. 지난 2주 동안, 당신은 기침 때문에 얼마나 자주 곤란함을 느끼셨습니까?
① 항상 ② 대부분 시간 ③ 상당한 시간 ④ 때때로 ⑤ 약간 ⑥ 거의 없음 ⑦ 전혀 없음

6. 지난 2주 동안, 나는 기침 때문에 걱정스러웠다.
① 항상 ② 대부분 시간 ③ 상당한 시간 ④ 때때로 ⑤ 약간 ⑥ 거의 없음 ⑦ 전혀 없음

7. 지난 2주 동안, 나는 기침 때문에 직장 생활이나 일상 생활을 하는데 지장이 있었다.
① 항상 ② 대부분 시간 ③ 상당한 시간 ④ 때때로 ⑤ 약간 ⑥ 거의 없음 ⑦ 전혀 없음

8. 지난 2주 동안, 기침은 내가 일상생활을 즐겁게 보내는 것에 방해가 되었다.
① 항상 ② 대부분 시간 ③ 상당한 시간 ④ 때때로 ⑤ 약간 ⑥ 거의 없음 ⑦ 전혀 없음

9. 지난 2주 동안, 나는 페인트 냄새나 매연을 맡으면 기침을 하였다.
① 항상 ② 대부분 시간 ③ 상당한 시간 ④ 때때로 ⑤ 약간 ⑥ 거의 없음 ⑦ 전혀 없음

10. 지난 2주 동안, 기침 때문에 잠을 자는 데 지장이 있었습니까?
① 항상 ② 대부분 시간 ③ 상당한 시간 ④ 때때로 ⑤ 약간 ⑥ 거의 없음 ⑦ 전혀 없음

13. 지난 2주 동안, 나는 기침이 지긋지긋하다고 느꼈다.
① 항상 ② 대부분 시간 ③ 상당한 시간 ④ 때때로 ⑤ 약간 ⑥ 거의 없음 ⑦ 전혀 없음

14. 지난 2주 동안, 당신은 기침 때문에 쉰 목소리로 고생한 적이 있습니까?
① 항상 ② 대부분 시간 ③ 상당한 시간 ④ 때때로 ⑤ 약간 ⑥ 거의 없음 ⑦ 전혀 없음

15. 지난 2주 동안, 당신은 활력이 넘쳤습니까?
① 전혀 없음 ② 거의 없음 ③ 약간 ④ 때때로 ⑤ 상당한 시간 ⑥ 대부분 시간 ⑦ 항상

16. 지난 2주 동안, 당신은 기침 때문에 심각한 병이 있을까 봐 걱정을 한 적이 있습니까?
① 항상 ② 대부분 시간 ③ 상당한 시간 ④ 때때로 ⑤ 약간 ⑥ 거의 없음 ⑦ 전혀 없음

17. 지난 2주 동안, 당신은 기침 때문에 다른 사람들이 당신 건강에 문제가 있다고 생각할까 봐 걱정한 적이 있습니까?
① 항상 ② 대부분 시간 ③ 상당한 시간 ④ 때때로 ⑤ 약간 ⑥ 거의 없음 ⑦ 전혀 없음

18. 지난 2주 동안, 기침 때문에 대화나 전화 통화에 지장이 있었다.
① 항상 ② 대부분 시간 ③ 상당한 시간 ④ 때때로 ⑤ 약간 ⑥ 거의 없음 ⑦ 전혀 없음

19. 지난 2주 동안, 나는 내 기침 때문에 동료나 가족, 친구들이 불편했을 것이라고 생각한다.
① 기침할 때마다 항상 ② 대부분 ③ 상당한 부분 ④ 때때로 ⑤ 약간 ⑥ 거의 없음 ⑦ 전혀 없음

Simplified COugh Assessment Test (COAT)

기침 평가 설문지

기침이 얼마나 심하십니까? (간편기침평가검사)

다음 질문들은 기침이 얼마나 심한지 귀하의 육체적, 정신적 건강 상태와, 기침으로 인한 일상생활에 미치는 영향을 평가하기 위한 것입니다. 아래의 각 항목마다 **최근 3일 간**의 귀하의 상태에 해당하는 점수에 **체크 표시(✓)**를 해주십시오.

표 2. 간편기침평가검사(COugh Assessment Test: COAT)

	없음	약함	보통	심함	매우심함
기침을 얼마나 자주 하나요?	①	②	③	④	⑤
기침 때문에 일상생활에 지장이 있나요?	①	②	③	④	⑤
기침 때문에 잠자기 힘든가요?	①	②	③	④	⑤
기침 때문에 피곤한가요?	①	②	③	④	⑤
먼지 많을 때, 자극성 냄새, 찬공기를 마실 때 기침이 심해지나요?	①	②	③	④	⑤
총 점					점

Table 2 Concurrent validation of the final version of the COAT

	Reliability test cohort (<i>n</i> = 78)	Validation cohort (<i>n</i> = 323)
Test-retest reliability	ICC	
Frequency	0.81	—
Activity	0.75	—
Sleep	0.83	—
Fatigue	0.84	—
Hypersensitivity	0.83	—
Item-to-total correlation	Pearson's correlation, R	
Frequency	0.75	0.76
Activity	0.84	0.83
Sleep	0.77	0.73
Fatigue	0.84	0.86
Hypersensitivity	0.71	0.65
Inter-item correlation	Pearson's correlation, R	
Frequency-activity	0.67	0.65
Frequency-sleep	0.46	0.46
Frequency-fatigue	0.55	0.56
Frequency-hypersensitivity	0.38	0.38
Activity-sleep	0.57	0.48
Activity-fatigue	0.58	0.65
Activity-hypersensitivity	0.51	0.45
Sleep-fatigue	0.66	0.56
Sleep-hypersensitivity	0.32	0.22
Fatigue-hypersensitivity	0.50	0.49

COAT	
1	Cough frequency
2	Daily activity limitation
3	Sleep disturbance
4	Fatigue
5	Hypersensitivity to irritants

기침평가도구

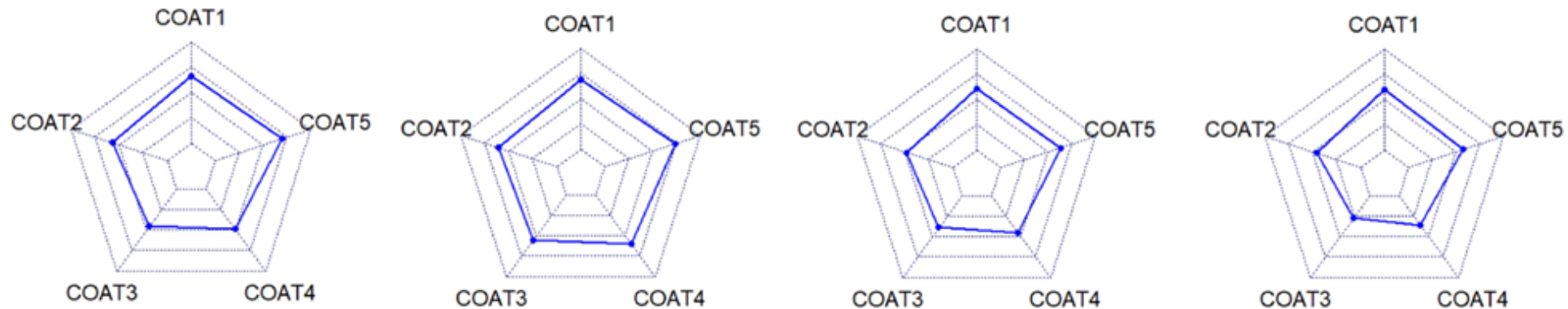
기침설문의 활용

기침설문과 병태생리의 이해

COAT difference between etiology

	Total (N = 246)	UACS (N = 115)	Asthma/CVA (N = 65)	EB (N = 40)	GERD (N = 31)	Idiopathic (N = 16)
Age, mean \pm SD	47.4 \pm 14.1	46.8 \pm 14.6	48.3 \pm 14.1	46.6 \pm 13.2	50.6 \pm 14.9	48.0 \pm 16.4
Male sex, N (%)	90 (36.6%)	45 (39.1%)	15 (23.1%) *	14 (35.0%)	13 (41.9%)	8 (50%)
Current smoking, N (%)	12 (5.2%)	3 (2.6%)	2 (3.1%)	2 (5.0%)	5 (16.1%) *	0 (0%)
Cough duration, weak (Q1, Q3)	12.0 (8.0, 24.0)	12.0 (8.0, 20.0)	16.0 (10.0, 24.5)	13.0 (9.0, 24.0)	12.0 (10.0, 15.75)	12.0 (8.0, 24.0)
Cough severity						
Cough NRS	6.0 \pm 2.2	6.1 \pm 2.2	6.5 \pm 2.2	5.7 \pm 2.1	5.4 \pm 2.3*	6.2 \pm 2.1
COAT total	11.3 \pm 4.1	11.5 \pm 3.9	12.7 \pm 3.7*	10.2 \pm 3.8	9.3 \pm 4.2*	11.4 \pm 4.5

(A) Upper airway cough syndrome (B) Asthma/Cough variant asthma (C) Eosinophilic bronchitis (D) Gastro-esophageal reflux disease



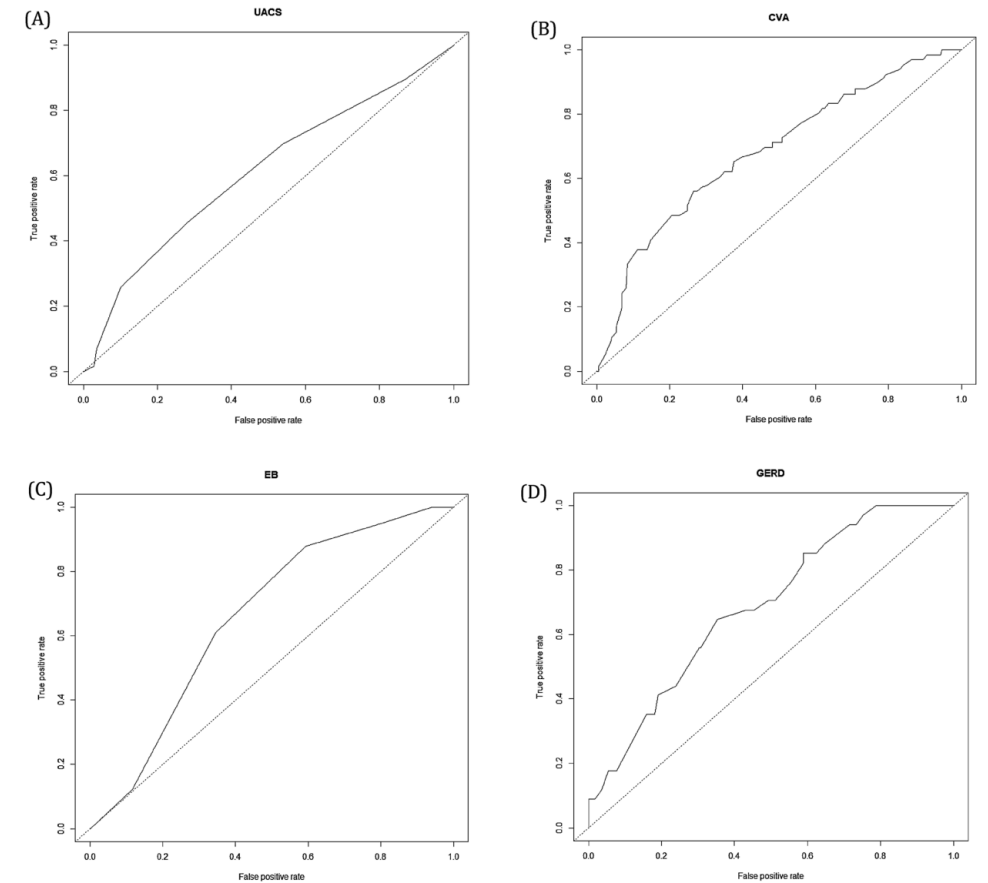
LCQ – Etiology

	Items	Total (N = 246)	UACS (N = 115)	Asthma/CVA (N = 65)	EB (N = 40)	GERD (N = 31)	Idiopathic (N = 16)
Physical							
1	Chest/stomach pain	4.7 ± 1.4	4.6 ± 1.5	4.6 ± 1.5	5.2 ± 1.1*	4.7 ± 1.4	4.8 ± 1.1
2	Bothersome phlegm	3.6 ± 1.7	3.4 ± 1.7	3.1 ± 1.6*	4.1 ± 1.9*	4.3 ± 1.8*	4.1 ± 1.7
3	Tiredness	3.9 ± 1.5	3.9 ± 1.6	3.4 ± 1.5*	4.2 ± 1.4	4.50 ± 1.6*	4.1 ± 1.6
9	Hypersensitivity to irritants	4.1 ± 1.5	4.0 ± 1.6	3.7 ± 1.6*	4.4 ± 1.3	4.6 ± 1.5	4.1 ± 1.4
10	Sleep disturbance	4.2 ± 1.5	4.2 ± 1.5	3.9 ± 1.5*	4.3 ± 1.4	4.7 ± 1.5	4.3 ± 1.3
11	Coughing bout frequency	3.8 ± 1.3	3.7 ± 1.3	3.6 ± 1.3	4.1 ± 1.3	4.1 ± 1.3	3.8 ± 1.3
14	Voice hoarseness	4.9 ± 1.4	4.6 ± 1.5*	4.6 ± 1.5	5.6 ± 1.0*	5.5 ± 1.1*	5.1 ± 1.2
15	Loss of energy	3.3 ± 1.5	3.3 ± 1.5	3.0 ± 1.5	3.6 ± 1.4	3.6 ± 1.5	2.9 ± 1.5
Psychological							
4	Feeling in cough of control	2.7 ± 1.3	2.6 ± 1.2	2.4 ± 1.2*	3.0 ± 1.3	2.7 ± 1.4	2.7 ± 1.2
5	Embarrassment	3.6 ± 1.4	3.6 ± 1.2	3.3 ± 1.3*	3.9 ± 1.2	4.2 ± 1.7	3.5 ± 1.4
6	Anxiety	3.1 ± 1.4	3.1 ± 1.3	2.9 ± 1.4	3.2 ± 1.4	3.5 ± 1.7	3.4 ± 1.4
12	Frustration	4.4 ± 1.5	4.4 ± 1.5	4.2 ± 1.4	4.7 ± 1.5	5.0 ± 1.4*	4.2 ± 1.7
13	Feeling of fed-up	3.3 ± 1.6	3.2 ± 1.6	3.1 ± 1.5	3.6 ± 1.6	4.1 ± 1.6*	3.1 ± 1.6
16	Worries about serious illness	3.5 ± 1.6	3.4 ± 1.6	3.3 ± 1.5	4.0 ± 1.4*	3.8 ± 1.9	3.3 ± 1.5
17	Concern other people's thought	3.6 ± 1.6	3.5 ± 1.5	3.4 ± 1.5	3.9 ± 1.6	4.3 ± 1.9*	3.2 ± 1.7
Social							
7	Job/daily activity interference	3.7 ± 1.5	3.7 ± 1.4	3.3 ± 1.5*	4.2 ± 1.3*	4.3 ± 1.6*	3.9 ± 1.7
8	Overall life enjoyment interference	3.6 ± 1.4	3.5 ± 1.4	3.2 ± 1.4*	4.1 ± 1.3*	4.2 ± 1.5*	3.4 ± 1.3
18	Interruption of conversation/ phone call	3.9 ± 1.6	3.9 ± 1.5	3.9 ± 1.6	4.0 ± 1.6	4.2 ± 1.8	3.9 ± 1.6
19	Annoyance to partner/friend/family	3.2 ± 1.7	3.1 ± 1.6	3.1 ± 1.7	3.5 ± 1.6	3.9 ± 2.2	3.1 ± 1.6
Total LCQ		11.1 ± 3.2	10.9 ± 3.0	10.4 ± 3.2*	12.1 ± 2.8*	12.6 ± 3.5*	11.1 ± 3.1

LCQ – Etiology

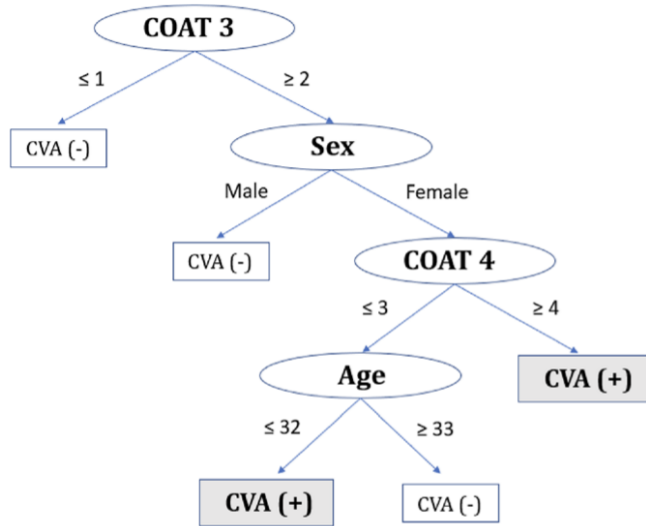
	Item	Odds ratio	95% CI
UACS	Voice hoarseness (LCQ 14)	0.76	0.54–0.91
Asthma/CVA	Female sex	2.16	1.12–4.17
	Tiredness (LCQ3)	0.79	0.64–0.96
	Hypersensitivity (LCQ9)	0.82	0.69–0.99
EB	Voice hoarseness (LCQ14)	1.59	1.19–2.11
GERD	Feeling of fed-up (LCQ13)	1.35	1.05–1.74
	Voice hoarseness (LCQ14)	1.42	1.01–1.99

Table 3. Multivariable analysis and relative impact of each item on cause of chronic cough.



COAT – Etiology

(A) Asthma/Cough variant asthma



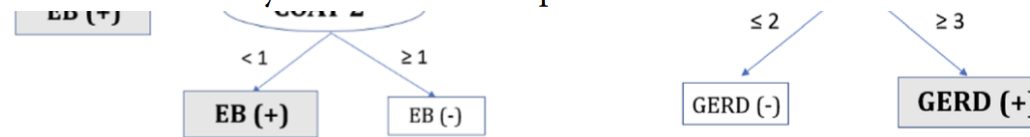
COAT 1: Frequency of cough
COAT 2: Limitation on daily activities
COAT 3: Sleep disturbance
COAT 4: Fatigue
COAT 5: Hypersensitivity to irritants

(B) Eosinophilic bronchitis

(C) Gastro-esophageal reflux disease

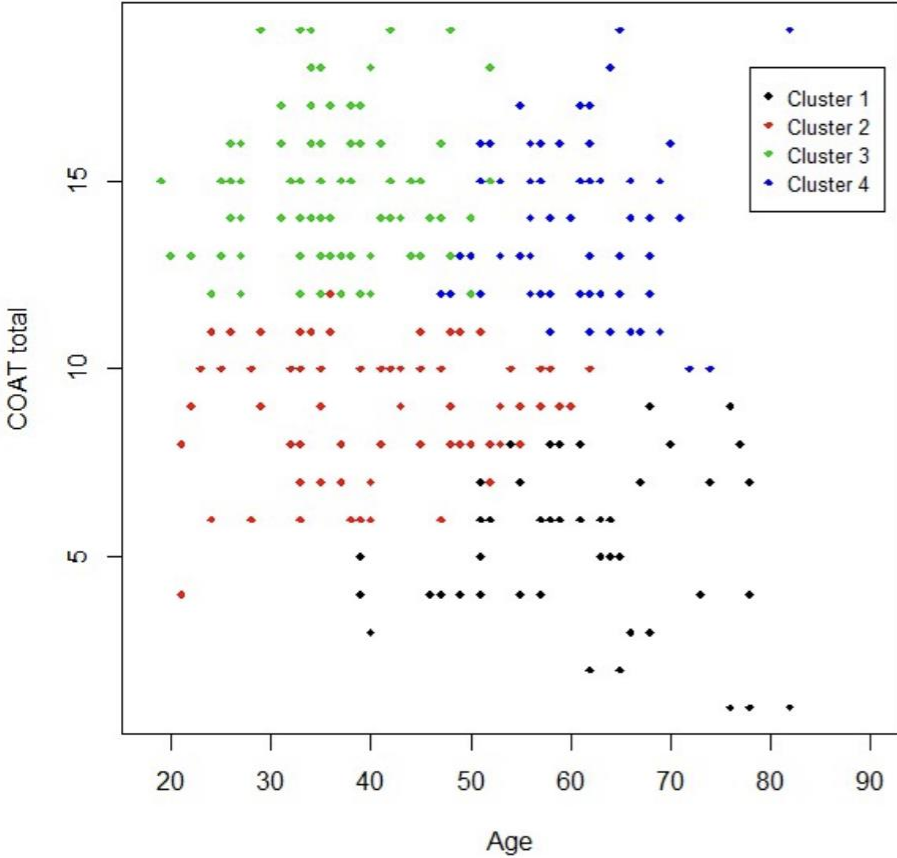
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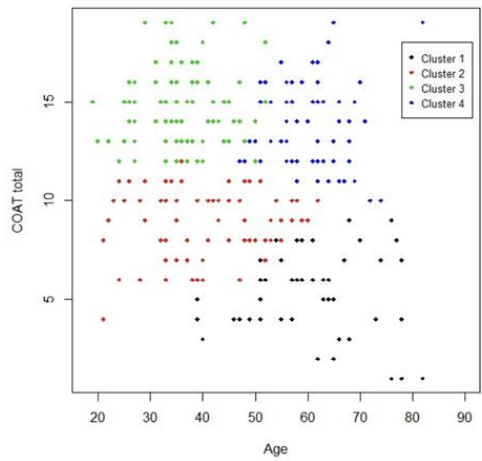
Table 3. Multivariable analysis and relative impact of each item on cause of chronic cough.



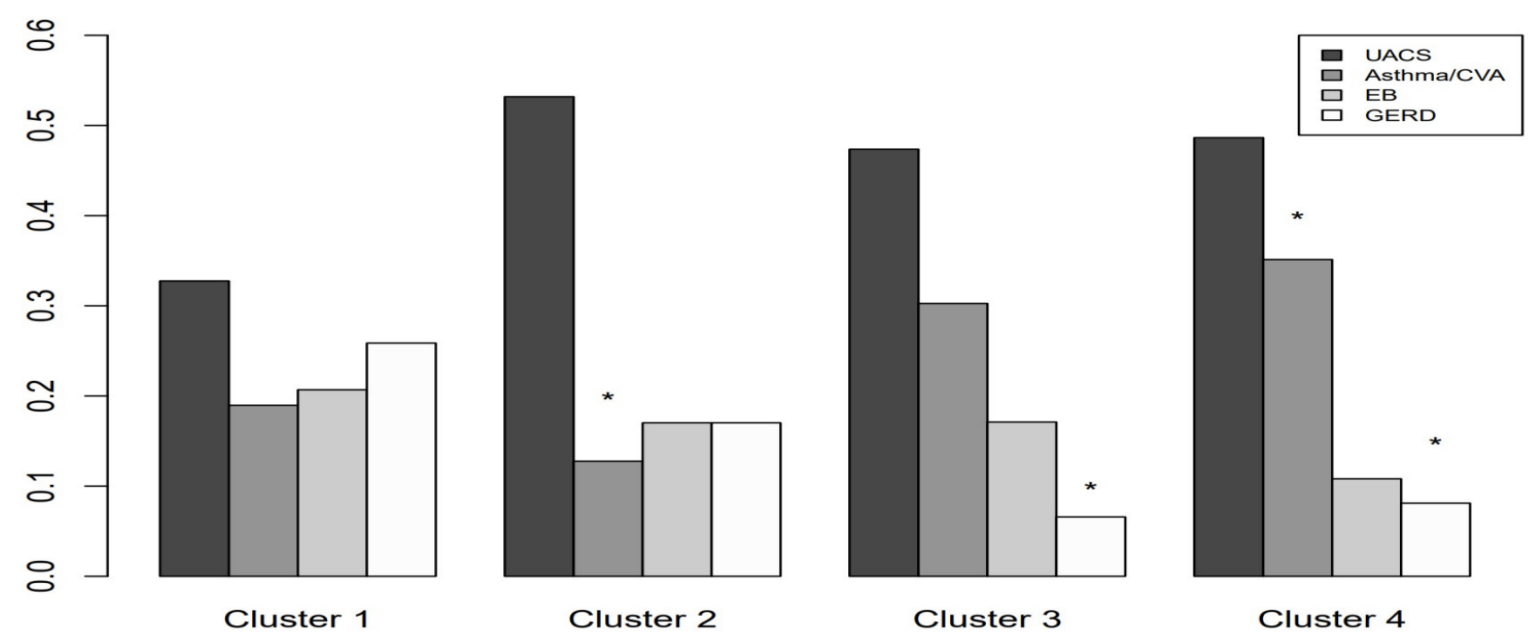
Accuracy 0.76, 0.83, 0.85

COAT - Clustering





	Cluster 1	Cluster 2	Cluster 3	Cluster 4
Baseline characteristics	Elderly	Middle-aged	Young	Elderly
			Male predominance	Female predominance
Cough Severity	COAT ↓↓	COAT ↓	COAT ↑	COAT ↑
	K-LCQ ↑	K-LCQ →	K-LCQ ↓	K-LCQ ↓
Etiology	GERD ↑	Asthma/CVA ↓		Asthma/CVA ↑ GERD ↓





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감사합니다