

살아 숨 쉬는 증례와 함께 하는 성인 (노인) 천식 진단과 치료

박한기
칠곡경북대병원 알레르기내과

칠곡경북대병원 알레르기내과

Asthma Diagnosis

- Episodic symptoms of airflow obstruction or hyperresponsiveness
- Airflow obstruction is at least partially reversible (12% and 200mL)
(asthma-therapeutic trial)
- Alternative diagnoses are excluded (but other lung disease often co-exist)
- Underlying airway inflammation

- [illegible]

Asthma Treatment

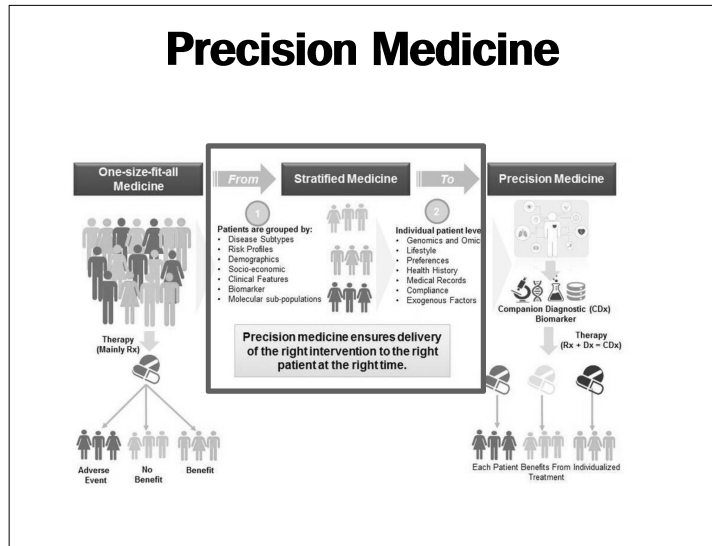
- Routine treatment
 - ICS/LABA
 - LTRA, theophylline

↓

- Uncontrolled
 - Mixed therapy
 - LAMA
 - Systemic steroid

The diagram illustrates the effectiveness of routine asthma treatment. It starts with a box labeled 'Patient population' containing 16 stylized human figures. An arrow points from this box to two groups of figures. The first group, labeled 'No Benefit', contains 4 figures. The second group, labeled 'Benefit', contains 12 figures.





노인천식은 다른 천식과 다르다!

19세 남자 dyspnea로 응급실 내원

5년전부터 봄철마다 콧물, 코막힘, 기침
대학입학 후 야외활동 증가
3주전부터 콧물, 코막힘, 기침 시작
2주전부터 운동시 호흡곤란, 야간 호흡곤란
내원 당일 아침 악화된 호흡곤란, 기침으로 응급실 내원

흡연력: non-smoker
가족력: 어머니 알레르기 비염
애완동물: 고양이

PFT: FEV1/FVC: 48%, FEV1: 1940 (50%), FVC: 4070 (96%)
BDR: 60mL, 3%
Chest PA: 정상

FeNO: 125ppb
Blood eos: 770 (6%)
Total IgE: 324.5 IU/mL
MAST (inhalent): Dp, Df, cat: class 0, Birch: class 6, Alder: class 2

19세 남자

Short term Systemic steroid

High dose ICS/LABA

LTRA

→ 증상 호전되어 퇴원

1Mo F/U

PFT: FEV1/FVC: 75, FEV1: 3660 (94%), FVC: 4900 (116%)

Allergen immunotherapy (Birch, alder)

Low dose ICS/LABA SMART

→ Well controlled

72세 남자

수년전부터 감기 걸리면 기침, 가래 심하고, 오래감.
초기 만성폐쇄성폐질환이라 듣고 흡입기, 항생제 등 처방 받아 치료, 현재는 약 복용하지 않음.
1주일 전부터 기침, 가래, 호흡곤란 → 감기약 복용 후에도 호전 없음.
내원 당일 아침 호흡곤란 악화되어 응급실 내원.

흡연력: Ex smoker (30X0.5PY)

PMHx: 고혈압, 고지혈증

관절통, 우울증약 복용 중

PFT: FEV1/FVC: 37%, FEV1: 1240 (53%), FVC: 3350 (98%)

BDR: 240mL, 19%

FeNO: 62ppb

Blood eos: 580 (7.4%)

Total IgE: 121.5 IU/mL

MAST: all negative

Chest CT: diffuse emphysema and bronchial wall thickening in both lungs, tiny calcified granulomas in left lung

72세 남자

Systemic steroid

High dose ICS/LABA

LAMA

1Mo F/U

PFT: FEV1/FVC: 40, FEV1: 1380 (70%), FVC: 3450 (99%)

6개월 후 응급실 내원

FEV1/FVC: 30, FEV1: 910 (39%), FVC: 3020 (90%)

전신 관절통증

“이렇게 아픈데 살아서 머하나 싶어 약 사용안했어요”

Asthma in the elderly

Atopy

Co-morbidity

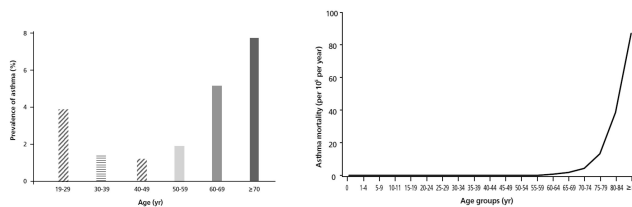
Smoking history

Depression

Emphysema
Fixed airway obstruction

Compliance

Epidemiology of asthma in the elderly



Oh YM, J Korean Med Assoc 2018

- Decreased lung function, loss of lung elastic recoil, reduced respiratory muscles strength → small airway obstruction, frequent symptom
- Inflamm-aging (low grade, chronic, systemic, IL-1beta, IL-6, TNF-alpha inflammation)
- Gene interaction with environment

Characteristics of asthma in the elderly

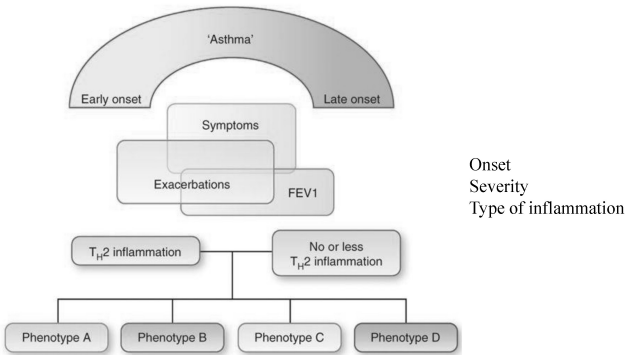
- Diagnosis and phenotype
 - Underdiagnosed Undertreated (reduced perception, under estimation)
 - More severe, Uncontrolled, High mortality
- Difficulties to perform diagnostic tests (PFT)
- More neutrophilic airway inflammation
- Combined COPD (ACO), airway remodeling

Characteristics of asthma in the elderly

- Management
 - Insufficient understanding of the disease
 - Memory impairment, hearing loss
 - Poor adhesion and follow up
 - Poor inhaler technique
 - Numerous co-morbidities
 - Polypharmacy and increased risk of interactions

노인천식에도 다양한 표현형이 존재한다

Asthma Phenotype



Nature Med. 2012;18:716-725

77세 여자

6개월전부터 기침, 가래
1달전부터 밤마다 호흡곤란, 쌉쌉거림

흡연력: never smoker
비염 (+), 코막힘, 후각상실
진통제 알레르기 (diclofenac, aceclofenac)
Thrombocytopenia로 혈액중양내과 F/U
고지혈증약 복용중

PFT: FEV1/FVC: 77%, FEV1: 1100 (90%), FVC: 1430 (76%)
FeNO: 200ppb
Blood eos: 120 (3.3%)
MAST: all negative
PNS x-ray: both maxillary sinus mucoperiosteal thickening, deviated nasal septum to the left

77세 여자

High dose ICS/LABA
LTRA
Sinusitis management
→ 호흡곤란, 기침, 가래 호전/ 후각, 미각 회복
→ 약 잘 사용하지 않으니 감기기운, 후각 재발

Severe asthma
Eosinophilic inflammation
Sinusitis, NSAID hypersensitivity (+)
ACO, smoking (-)
Atopy (-)

67세 남자

40년전 천식, 비염 진단받음.
가을마다 콧물, 기침 악화

흡연력: never smoker

PFT: FEV1/FVC: 82%, FEV1: 2080 (90%)
MBPT: Pc20: 1.25mg/dl
FeNO: 56ppb
Blood eos: 330 (6.5%)
Skin prick test: Dp 20X20, Df: 25X20

67세 남자

low dose ICS/LABA
Antihistamine, INS

Immunotherapy (5년)
가을에 가벼운 코증상 → 항히스타민

mild asthma
Early onset
Eosinophilic inflammation
ACO, smoking (-)
Atopy (+)

78세 여자

1달전부터 호흡곤란 발생
걷기 등 일상적인 활동에 호흡곤란, 휴식 후 호전
내원 당일 아침 호흡곤란 악화되어 응급실 내원.

흡연력: Ex smoker (20PY)
비염 (-)
전신 관절통증으로 진통제 복용중
고혈압, 고지혈증 약제 복용중 (ARB, statin)

PFT: FEV1/FVC: 37%, FEV1: 840 (53%), FVC: 2280 (98%)
BDR: 240mL, 36%
FeNO: 17ppb
Blood eos: 110 (0.9%)
Total IgE: 121.5 IU/mL
MAST: all negative
Chest CT: diffuse emphysema and bronchial wall thickening in both lungs, tiny calcified granulomas in left lung

78세 여자

Systemic steroid
High dose ICS/LABA
LAMA

1Mo F/U
PFT: FEV1/FVC: 40, FEV1: 1180 (72%), FVC: 2970 (123%)

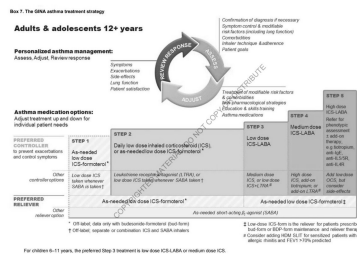
6개월 후 응급실 내원
FEV1/FVC: 27, FEV1: 620 (39%), FVC: 2260 (97%)

pneumonia

- 2019년 대한천식알레르기학회 제55차 교육강좌

Asthma Severity

In the past 4 weeks, has the patient had:		Well controlled	Partially controlled	Uncontrolled
• Daytime asthma symptoms more than twice/week?	Yes <input type="checkbox"/> No <input type="checkbox"/>	None of these	1-2 of these	3-4 of these
• Any night waking due to asthma?	Yes <input type="checkbox"/> No <input type="checkbox"/>			
• Reliever needed for symptoms* more than twice/week?	Yes <input type="checkbox"/> No <input type="checkbox"/>			
• Any activity limitation due to asthma?	Yes <input type="checkbox"/> No <input type="checkbox"/>			
	Yes <input type="checkbox"/> No <input type="checkbox"/>			



Type of inflammation

Type 2 low Atopy (+)	Type 2 high Atopy (+)
Type 2 low Atopy (-)	Type 2 high Atopy (-)

Blood
eosinophilMAST
RAST

Asthma Phenotypes

- **Severity**
- **Type of inflammation**
- **Onset of Age**
- **ACO, smoking**
- **Atopy**
- **Obesity (BMI), Sinusitis/Polyps, GERD, OSA, etc**

노인천식의 치료는 약제선택 이외에
다양한 부분을 함께 고려

82세 남자

Asthma-COPD overlap, non-T2 inflammation, atopy (-)

Ex-smoker, Tuberculosis history, Emphysema and bronchiectasis

Frequent symptom exacerbation

Sinusitis (-), low BMI

HTN, dyslipidemia, DM

Depression, hearing loss

82세 남자

High dose ICS/LABA, LAMA

→ Poor technique inhaler (cognitive function, hearing loss)

→ Poorly adherence (depression)

→ Pneumonia

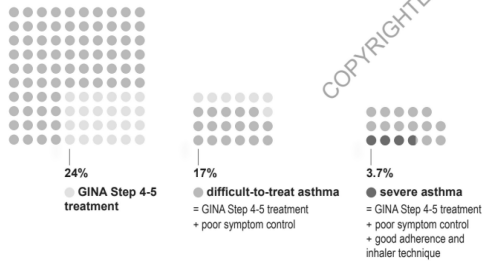
→ Exacerbation

→ Systemic steroid

→ Poorly glucose control

Difficult-to-treat asthma

Box 1. What proportion of adults have difficult-to-treat or severe asthma?



These data are from a Dutch population survey of people ≥ 18 years with asthma²

Difficult-to-treat asthma

- Confirmation the diagnosis of asthma
- Correction of modifiable risk factors
 - Smoking
 - Exposure to sensitized allergen or stimuli
 - Inhaler technique/compliance
 - Adverse events to asthma medication
- Controlling comorbidities
 - CRS, GERD, OSA, obesity
 - Depression/anxiety disorder

Therapeutic consideration in elderly asthma

- Therapeutic approach is generally not different.
- Several therapeutic challenges in the elderly
 - inhaler technique
 - high risk of side effects (oral steroids)
 - less safety data on most usual drugs
 - frequent comorbidity
 - polypharmacy
 - management of multiple comorbidity

Risk of corticosteroids

- Oral corticosteroids
 - osteoporosis
 - bone fracture
 - diabetes mellitus
 - infection
 - obesity
 - cataract
 - ulcer
 - muscle weakness ...

Risk of corticosteroids

- High dose inhaled corticosteroids ($> 1000 \mu\text{g/d}$)
 - Osteoporosis
 - local side effects
 - hoarseness
 - dysphonia
 - cough
 - oral candidiasis
 - Pneumonia

Anticholinergics

- may be more useful in the elderly due to
 - high frequency of COPD comorbidity
 - maintained muscarinic receptors in the elderly (unlike β_2 -adrenergic receptors)
- Side effects: dry mouth, constipation, glaucoma, BPH

Theophylline

- Slow clearance in the elderly
- Safety: controversial
 - Western data: risk $>$ benefit
 - Asian data: mostly safe

Control of comorbidity: depression

Asthma–depression

- Association
: odds ratio ≈ 2
- Interactions
: cause-effects
+ treatment outcome
- Predictor for exacerbation

Education

- asthma action plan
: how to self-manage
asthma exacerbation
- family care

Summary

- 노인천식은 다른 천식과 다르다.
 - 기도와 폐의 변화, 염증의 변화, 유전자-환경 상호작용의 누적
 - 다른 연령에 비해 유병률도 높고 중증도도 높다!
 - 진단과 치료의 어려움 (COPD/심장질환 등과 감별, 인지 및 학습 능력, 동반질환, 동반약제)
- 노인천식 내에도 다양한 표현형이 있다.
 - 중증도, 염증패턴
 - 아토피, COPD동반유무, 질병시작시점
 - 비만, 흡연, 충농증, NSAID과민성, 위식도역류, 수면무호흡증 등

Summary

- 노인천식 치료는 일반적인 천식치료와 같으나 환자의 인지능력, 동반질환에 대한 고려가 반드시 필요하다!
- 환자의 동반질환과 약제의 부작용을 고려한 약제의 선택
- 환자가 이해했는지, 잘 사용하는지 보다 세심한 확인 필요
- 우울증, 약에 대한 두려움으로 약제 사용을 주저하는지 확인
- 다양한 상황에 대한 action plan 설정, 가족들이 치료에 함께 참여할 수 있도록 유도