



Asthma COPD Overlap (ACO)

Dr Thomas Brown
Consultant Respiratory Physician
Thomas.Brown@porthosp.nhs.uk

Dr Hitasha Rupani
Consultant Respiratory Physician
Hitasha.rupani@porthosp.nhs.uk

What is Asthma COPD Overlap Syndrome...

- COPD with onset <40yrs of age
- Asthma with fixed airflow obstruction
- COPD with evidence of atopy
- Chronic airways disease with features of both asthma and COPD
- All of the above

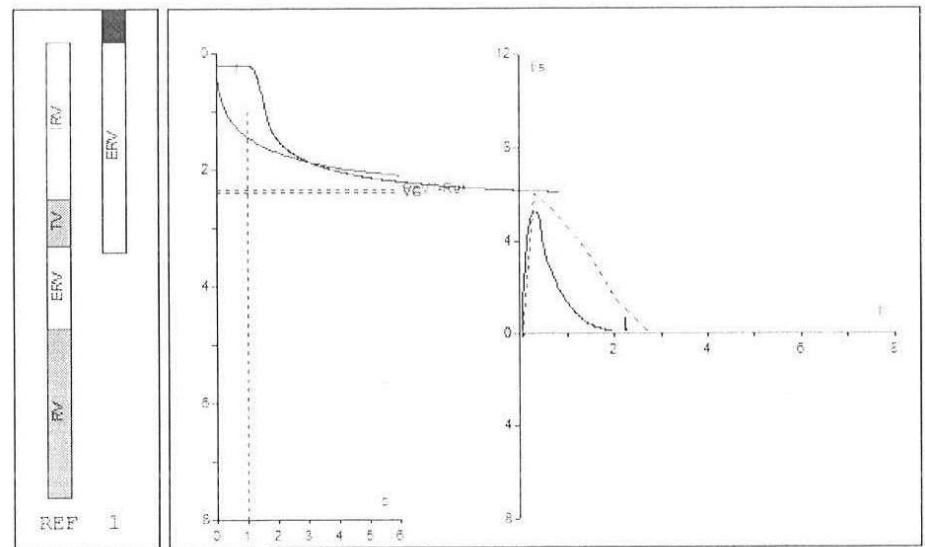
Clinical Case...

- Charlie is a 54-year-old electrician who presents to you with a persistent cough productive of yellow sputum, breathlessness and wheezing on exertion and on waking in the morning. He has a 20 pack-year smoking history having stopped 12-years previously and has no significant past medical history other than hayfever. He has noticed his breathing is worse over the winter months and when he is near cars.
- What would you do?

Clinical Case...

- **FEV1** 1.45L (63% predicted)
- **FVC** 2.32L (84% predicted)
- **FEV1/FVC**: 63%
- **Post-BD FEV1** 1.75L (21%)
- **FeNO** 55 ppb, eosinophils 0.3

Spirometry + Flow-Volume



- What would you do now?



GLOBAL
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FOR ASTHMA

Asthma is a heterogeneous disease, usually characterised by chronic airway inflammation. It is defined by the history of symptoms (wheeze, shortness of breath, chest tightness and cough) that vary over time and in intensity, together with variable expiratory airflow limitation.

GINA Guidelines 2017



COPD is a common preventable and treatable disease, characterised by persistent airflow limitation that is usually progressive and associated with enhanced chronic inflammatory responses in the airways and the lungs to noxious particles or gases. Exacerbations and comorbidities contribute to the overall severity in individual patients.

GOLD Guidelines 2016



GLOBAL
INITIATIVE
FOR ASTHMA

ACO



Asthma-COPD Overlap (ACO) is characterised by persistent airflow limitation with several features usually associated with asthma and several features usually associated with COPD.

Not a single disease but multiple phenotypes

- COPD with predominantly eosinophilic inflammation
- Asthma with fixed airflow obstruction and predominantly neutrophilic inflammation
- Different underlying mechanisms

- ~15% (to 55%) of obstructive airways disease

The Importance of ACO...

Distinguishing asthma and COPD can be problematic particularly in older patients and smokers

Outcomes worse than for asthma or COPD alone:

- Greater exacerbation frequency
- Worse quality of life
- More rapid decline in lung function
- Higher mortality
- Disproportionate healthcare resource usage

Identifying and Managing ACO...

1. Confirm chronic airways disease
2. Assess features favouring asthma vs COPD
3. Lung function measures
4. Initial treatment
5. When to refer

1. Confirm chronic airways disease...

- History
- Physical exam
- Radiology – CXR/HRCT

History

Chronic or recurrent cough
Sputum
Breathlessness and wheeze
Recurrent infections
History of smoking

Radiology

May be normal
Hyperinflation, airway wall thickening
May suggest alternative or additional diagnosis

Physical exam

May be normal
Wheeze/ crackles

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2. Assess features favouring asthma vs COPD...

	ASTHMA	COPD
Age of onset	<input type="checkbox"/> Before age 20	<input type="checkbox"/> After age 40
Symptoms	<input type="checkbox"/> Variable <input type="checkbox"/> Triggered by allergens, exercise, emotions, dust <input type="checkbox"/> worse during the night/ early morning	<input type="checkbox"/> Persistent despite treatment <input type="checkbox"/> Exertional symptoms <input type="checkbox"/> Chronic cough and sputum
Lung function	<input type="checkbox"/> Variable airflow limitation <input type="checkbox"/> normal between symptoms	<input type="checkbox"/> Persistent airflow limitation (FEV1/FVC <0.7) <input type="checkbox"/> abnormal between symptoms
Past history or family history	<input type="checkbox"/> Previous diagnosis of asthma <input type="checkbox"/> Family history of asthma	<input type="checkbox"/> Previous diagnosis of COPD <input type="checkbox"/> Exposure to risk factor (tobacco smoke)
Time course	<input type="checkbox"/> Variability over time <input type="checkbox"/> Improve with bronchodilators	<input type="checkbox"/> Progressive symptoms <input type="checkbox"/> Limited relief with short-acting bronchodilators
CXR	<input type="checkbox"/> Normal	<input type="checkbox"/> Hyperinflation

Diagnosis of asthma, COPD and ACO

- If the patient has ≥ 3 features of either asthma or COPD, there is strong likelihood that is the correct diagnosis
- BUT, the absence of any of these features does not rule out either diagnosis eg. Absence of atopy does not rule out asthma
- When the patient has a similar number of features of both, consider the diagnosis of ACO

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3. Lung Function Measures...

- Spirometry: essential
- Measure before and after treatment trial

	Asthma	COPD	ACO
Normal FEV1/FVC	✓	Not compatible	Need other evidence
Post-bronchodilator FEV1/FVC <0.7	✓	Required for diagnosis	✓
Post-bronchodilator increase in FEV1: >12% and 200 ml	Usual at some point, not always present	Common in COPD, more likely when FEV1 is low	Common in ACO
Post-bronchodilator increase in FEV1: >12% and 400ml	High probability of asthma	Unusual Consider ACO	✓

Diagnostic criteria for ACO

Major (ALL present)

1. Persistent airflow limitation in individuals >40 years old
2. At least 10 pack year smoking history OR equivalent pollution exposure
3. Documented history of asthma before 40 years of age OR bronchodilator reversibility >400ml in FEV1

Minor (at least one present)

1. Documented history of atopy or allergic rhinitis
2. Bronchodilator reversibility ≥ 200 ml and 12% from baseline
3. Peripheral blood eosinophil count ≥ 0.3

Identifying and Managing ACO...

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5. When to refer

4. Initial Treatment...

- **Treat as asthma with ICS to reduce morbidity and mortality**
- Low-Moderate dose ICS
- No role for bronchodilators without ICS
- Treat modifiable risk factors – smoking/occupation
- Address co-morbidities
- Increase physical activity levels/Pulmonary rehab
- Vaccinations
- Self-management plan/Disease education
- Regular follow-up

5. When to Refer...

- Diagnostic uncertainty
- Persistent symptoms or exacerbations despite treatment
- Complex co-morbidity (diagnostic or treatment challenge)

- Advanced lung function testing (gas transfer, airway resistances (reversibility), oscillometry, CPET)
- Imaging - HRCT Bronchiectasis/Emphysema/Fibrosis
- Inflammatory biomarkers (FeNO, blood, sputum, BAL)

Another case

- 64 year old builder
- COPD, on Tiotropium
- Referred: recurrent infections; sputum culture no growth
- Monthly exacerbations, breathless only when has an exacerbation
- Significant symptoms due to allergic rhinitis

Investigations

- Spirometry: FEV1/FVC 1.13 (53%) /3.10 (71%), ratio 37%
- Post bronchodilator FEV1 1.32 (17%)
- PEF variability: 280 in the mornings, 350 in the evenings
- Eosinophils: 0.9, IgE raised at 190

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Management

- Started on ICS/LABA
- Reduction in exacerbation frequency
- High dose ICS, nasal steroid, montelukast and azithromycin
- Significant clinical improvement

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Questions?