Acute Exacerbation of COPD

(GOLD guideline 2020)

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✪ ممكن نسميه تفاقم حاد فى السده الرئويه المزمنه

➢ Definition

Acute worsening of respiratory symptoms (Cough, sputum production, dyspnea and wheezes) of pre-existing COPD that needs additional therapy

➢ ايه هو سبب ال EXACERBATION ؟

I. Infective causes

A. Viral (most cases)

- common cold (rhinovirus) : most common
- influenza
- Coronaviruses (common nowadays during the pandemic)

B. Bacterial

- The most common cause is ***Hemophilus influenza***
- Others:
    - Strept.pneumoniae & Moraxella Catarrhalis
    - atypical bacteria

II. Non-infective causes

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- Cold air
- Air pollution with black smoke, sulfur dioxide and nitrogen dioxide

➢ Clinical Presentation:

➡ **Worsening of COPD features**

- ✓ increased cough
- ✓ increased amount & purulence of the sputum
- ✓ increased wheezes
- ✓ increased dyspnea

➡ **features of underlying precipitating infection**

- runny nose , sore throat , fever & myalgia in viral infective exacerbation
- high fever + purulent sputum in bacterial pneumonia

➡ **features of respiratory failure in severe cases**

- Tachypnea
- accessory muscle use
- Cyanosis
- confusion
- worsening hypoxia

➢ **هل المرض ده درجة واحدة ؟ !**

This disease has 3 degrees of severity

I. Mild exacerbation:

- increased cough , sputum (often in viral exacerbation)
- No respiratory failure symptoms

II. Moderate :

- Increased cough & purulent sputum & fever and dyspnea (often with bacterial exacerbation)
- No respiratory failure symptoms

N.B: No respiratory failure means

- Respiratory rate RR : 20 - 30
- No use of accessory muscles (sternomastoid & supra & intercostal retractions)
- No changes in mental status
- Hypoxia which is responding low flow oxygen via Venturi mask 28 - 35% (2 - 4 L)

ملحوظه هاااامه :

مريض ال COPD عنده درجة من درجات ال hypoxia ,

وده ال baseline بتاعه قبل اصابته بال exacerbation

III. Severe:

Symptoms as above

✚ Features of **acute respiratory failure** ↴↴

- Worsening hypoxia (low O2 saturation)
- Accessory muscle use
- Tachypnea
- Confusion
- Cyanosis

➲ **Acure respiratory failure might be**

Non - Life threatening	Life threatening
- RR > 30 -Use of accessory respiratory muscles - No change in mental status - Hypoxia improving with O2 by Venturi mask (25 - 30 %) { 1 - 3 } L - increased PaCO2 over the baseline with range : 50 - 60 - PH : 7.25 - 7.35	-RR > 30 - use of accessory respiratory muscles - acute changes in mental status - hypoxemia that is not improving with Venturi mask - increased PaCO2 (PaCO2 > 60) - PH < 7.25

➢ ايه الفحوصات اللى هتعملها لمريض شاكك انه عنده **Acute exacerbation of COPD**

- Bed side O2 saturation
- ABG
- CXR or CT chest
- Basic labs & particularly (CBC & CRP)
- Sputum & blood culture in case of bacterial pneumonia

You have to assess

- RR
- Accessory respiratory muscle use
- Confusion
- Cyanosis
- Auscultation of the chest

➢ هل تشخيص ال COPD exacerbation بيبقى سهل غالبا

ولا هناك متشابهات ولازم تحطها فى ال DD ،، كسبب للتدهور الحاد فى مريض ال COPD ؟

- Any patient with pre-existing COPD and develops acute deterioration that makes you think about acute exacerbation
- You have to exclude such possibilities

DD of Acute exacerbation of COPD

- Pneumothorax (rupture bulla) مهم
- Pleural effusion
- Pneumonia without exacerbation
- PULMONARY EMBOLISM مهم
- Heart failure with pulmonary edema if the patient has cardiac disease in addition to COPD
- Tachyarrhythmias on top of cardiac disease in COPD patient (acute AF & MAT (multifocal atrial tachycardia)

➢ TREATMENT:

General plan of treatment according to severity :

- Mild:
  Treated with Short acting bronchodilators only (SABA & SAMA)
- Moderate:
  Treated with Short acting bronchodilators + antibiotics + oral steroid (or IV steroids)
- Severe:
  - hospitalization
  - Needs ventilator support

➡ When to hospitalize the patient with COPD?

- Severe symptoms such as worsening of resting dyspnea , high RR , decreased O2 saturation , confusion and drowsiness
- Acute respiratory failure
- new Cyanosis
- failure of response to initial treatment
- Presence of comorbidies like heart failure and new arrhythmias.

➡ Indication of admission to ICU

- Severe dyspnea that is not responding to initial treatment at ER
- Changes in mental status
- persistent and worsening hypoxia (PaO2 < 40)
- worsening respiratory acidosis with PH < 7.25 despite NIV
- Need for invasive mechanical ventilation
- Need for hemodynamic support (inotropes)

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I. Mild Exacerbation Treatment

- جلسات فاركولين او اتروفنت كل ربع - نصف ساعه لحين تحسن الاعراض مع ثبات ال O2 sat مابين ٨٨-٩٢%

واضافة علاج للاعراض وتكملة العلاج فى المنزل مع ضبط ال Home treatment of COPD

والمكون من بخاخات و anti-inflammatory agents و mucolytic حسب اخر جايدلاينز GOLD 2020

II. Moderate Exacerbation Treatment

علاج الmild exacerbation

+

IV antibiotics

Either

Levofloxacin 500 IV once (5 - 7 days)

Or

Amoxycillin Clavulinate

+

Oral prednisolone (40 mg /day) for 5 - 7 days

Or

IV solucortif vial /8hrs

+

Low flow oxygen

Either

Nasal cannula (2 - 4 L)

Or

Venturi mask 28 - 35% (2 - 4 L)

Target saturation: 88 - 92

✪ **ملحوظة هاامة :**

لابد من الحفاظ على مستوى الاكسجين فى الدم فى هذا ال range ،،

لو ارتفع ال O2 sat عن ٩٢ % ،، هيوقف الhypoxic drive

وال CO2 هيعلى و هيحصل

Worsening

للحالة

III. Severe exacerbation (acute non-life threatening respiratory failure)

- Nebulizers (farcolin or atrovent or combination)

Frequent With monitoring clinically and by O2 sat & ABG

- oral prednisolone better than IV solucortif
- IV antibiotics as before
- If PH still between 7.25 - 7.35
  - Start Noninvasive ventilation (NPPV)
  - Bi-BAP is the modality of choice with monitoring of conscious level , O2 sat , PH and PaCO2
- monitor and do fluid balance
- prophylactic dose of LMWH (clexane 40 mg s.c once /day to prevent thromboembolism
- ECG & ECHO to detect potential arrhythmias & pulmonary HTN

IV. Life threatening acute respiratory failure

- Invasive mechanical ventilation

➡ Indications of invasive mechanical ventilation

- Unable to tolerate NIV or NIV failure
- post -cardiac or respiratory arrest
- -confusion
- inability to remove respiratory secretions
- life threatening respiratory failure (PH < 7.25)
- shock