
بسم الله الرحمن الرحيم

COVID-19 and Pulmonology in the XXI century: Challenge or Opportunity?

- What is the ***health emergency*** specifically, and who exactly does it affect? Which groups are ***behind*** this health emergency?

- ***Healthcare systems*** were overwhelmed to the point of collapse both in terms of ***physical space*** and ***their ability*** to treat patients to the expected quality standards.

- In the first wave of this new entity ,the *most dominant* clinical manifestation has been severe ***life threatening respiratory involvement***.

- The demand for ***ICU admission exceeded capacity*** in the first weeks, so ***existing resources*** had to be expanded with the support of respiratory departments.

- At this point, ***respiratory medicine departments*** with their experience in non-invasive mechanical ventilation (NIMV) began to **play key role**.

- ***NIV*** offered a significant number of patients **relief from their respiratory failure**, while for others it ***provided life support*** while awaiting admission to an ICU.

- It is up to us to take ***the maximum benefit*** from the lessons ***learned by the pandemic*** in order to develop and affirm the position and relevance of pulmonology and respiratory departments in our society.

- As a ***scientific society***, it is our responsibility to call on the ***health authorities*** to provide us with the **material and human resources** we need to carry out our ***professional work*** to the required **standards of care** to minimize the consequences of this disease and to continue to ***serve patients*** with respiratory diseases.

- Among **patients hospitalized** with coronavirus disease 2019 (COVID-19), up to **one-quarter** require intensive care unit ***(ICU)*** admission.

- Among those who are critically ill, profound acute hypoxemic respiratory failure from **ARDS** is the ***dominant finding*** .**Hypercapnia** is rare. **Fevers** tend to wax and wane during ICU admission. The **need for mechanical ventilation** in those who are critically ill is high ranging from **30 to 100** percent.

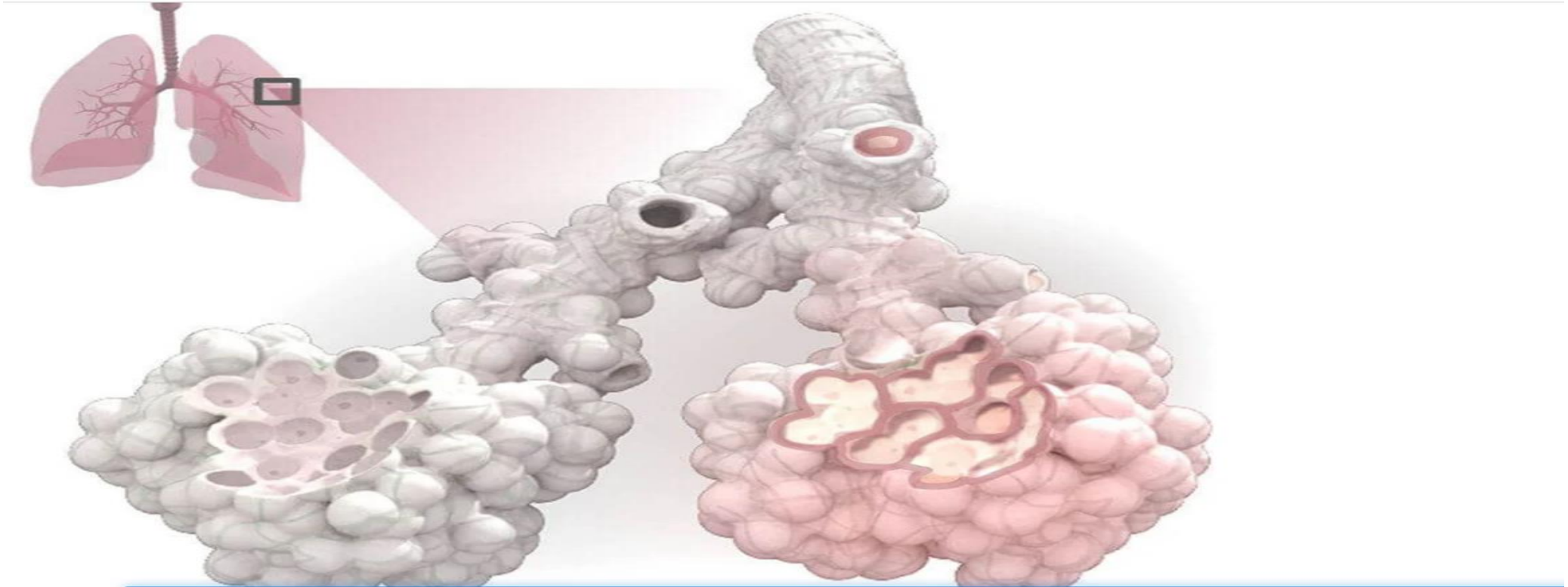
- ***Length of intensive care unit*** (ICU) stay appears to be **one to two weeks** or longer

- ***Common complications*** of COVID-19-related ***ARDS*** include acute kidney injury (**AKI**),elevated **liver enzymes**, and **cardiac injury** including cardiomyopathy, pericarditis, pericardial effusion, arrhythmia, and sudden cardiac death.

- Data on the risk of **secondary bacterial pneumonia** are limited, but it does not appear to be a major feature of COVID-19.

- ***Neurologic complications*** in critically ill patients are common, especially **delirium** or **encephalopathy** which manifests with prominent **agitation** and **confusion** along with corticospinal tract signs(hyperreflexia).

- ***Chest radiographs*** may be normal in early or mild disease. **Common abnormal** radiograph findings were **consolidation** and **ground glass** opacities, with bilateral, peripheral, and lower lung zone distributions; lung involvement increased over the course of illness, with a peak in **severity at 10 to 12** days after symptom onset.



ریه دارای عفونت

Chest CT

- Chest computed tomography (CT) can be **more sensitive** than ***chest radiograph*** and some chest CT findings can be **characteristic** of COVID-19.

- We ***not using*** chest CT **for screening** or **diagnosis** of COVID-19 and recommends ***reserving it*** for hospitalized patients .

- Chest CT in patients with COVID-19 most commonly demonstrates:

- Ground-glass opacifications
- Ground-glass opacifications with mixed consolidation
- Adjacent pleural thickening
- Interlobular septal thickening
- Air bronchograms

- Chest ***CT abnormalities*** in COVID-19 are **often bilateral**, have a **peripheral distribution**, and involve the **lower lobes**.

- Chest CT may be normal ***soon after the onset*** of symptoms, with abnormalities more likely to develop ***over the course*** of illness .

- Among patients who clinically improve, ***resolution of radiographic*** abnormalities may lag behind improvements in **fever and hypoxia**.

Lung imaging is utilized:

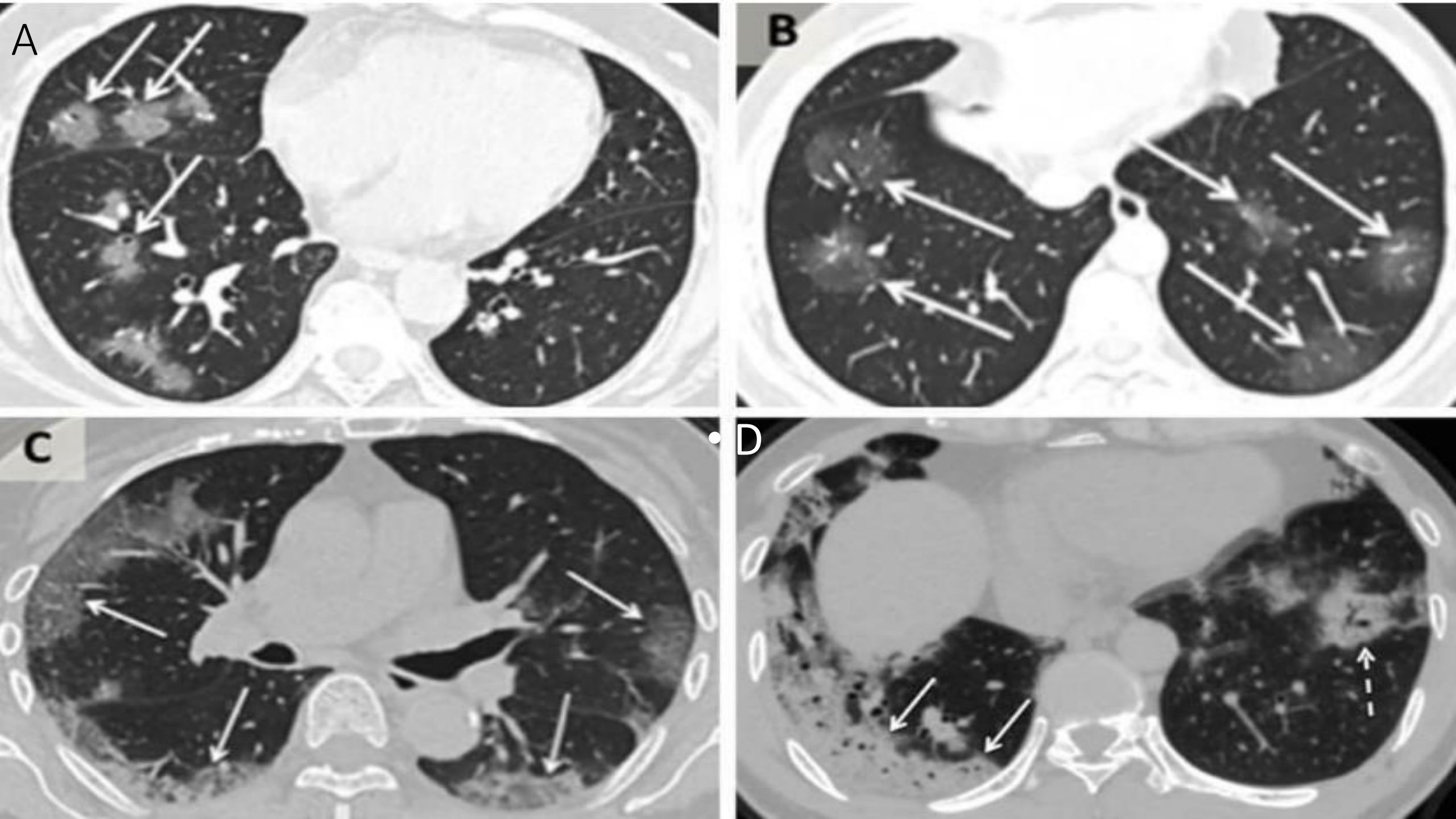
- As a part of patients with COVID-19 infection **particularly when** the PCR approach is not available.
- Could be considered as an **additional evaluation** beside ***lab testing*** for patients ***with critical conditions***.
- Chest X-ray has **low precision**, especially in early phase and minimal symptoms.
- In patients with cough, chilling, sore throat with dyspnea and hypoxia (RR>24 & Spo2<93)
- In **high risk patients** with ***leukocytosis*** or ***leukopenia*** and ***fever***, CT-scan should be carried out.

- lung imaging is **not indicated for screening** of COVID-19 .

- Generally, if ***severity of lung involvement*** is high in CT-imaging, ***hypoxemic intensity*** will be higher. However, necessarily this correlation is **not linear**. This is a strong reason for not using CT-scan in patients with ***minimal symptoms and signs***.

❖ Indication of repeating CT-scan:

Persistent hypoxemia without O2 after two weeks
progression of hypoxemia after two weeks of treatment
Abnormal PFT 4-weeks after the treatment
Candidates of chemotherapy and Immunosuppressive agent therapy after convalescence period.


A
B
C
D

Covid19 specific therapy

- Dexamethazon
- Remdesivir
- Convalescent plasma and other antibody-based therapies
- Il-6 pathway inhibitor
- Hydroxychloroquine/chloroquine
- Others: favipravir-interferons-azithromycin&HCQ-ivermectin-colchicine-famotidine-sofosbuvir…..

THE CHALLENGE OF MANAGING COVID-19 ASSOCIATED PULMONARY ASPERGILLOSIS

- ***Two immunosuppressant agents***, **corticosteroids** and **tocilizumab**, were widely used.
- The ***blockade of IL-6*** might be a **very specific risk factor** for the development of CAPA.
- It is known that ***corticosteroids*** can impair a **specific form of phagocytosis** called LC3-associated phagocytosis ,which is ***essential for host defense*** against aspergillosis.
- ***Dexamethasone*** was found to ***reduce mortality*** by **one-third** in seriously ill COVID-19 patients on ventilator support.

COVID-19 and pulmonary rehabilitation

- The ***follow-up*** is currently the ***new challenge*** as it was in the beginning for ICUs. Indeed, it is **not clear** if COVID-19 will leave **permanent lung and/or physical damage** and, if so, to what extent.

- ***Persisting limitations*** in **respiratory function** and **gas exchange** will likely be more pronounced in the subgroup of ***ICU survivors***.

- How can we identify patients ***with an impaired health condition*** after COVID-19 and how can the ***follow-up be organised***?

- Some patients with a ***poor health condition***, specifically those with an ***extended long stay in the ICU***, will be discharged immediately for **inpatient rehabilitation**.

Pulmonary embolism in COVID-19

- The severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) pandemic has raised **new challenges** in the ***diagnosis of pulmonary embolism.***

- Patients with coronavirus disease 2019 (COVID-19) are at **increased risk** of ***developing venous thromboembolism***, but symptoms of COVID-19 and PE ***may overlap***, which makes it difficult to identify those with a higher likelihood of PE.

- The authors report that they "identified a **D-dimer cut-off value of 2590 ng·ml** to ***best predict*** occurrence of PE.

- ***Particular attention*** should be paid to search for **potential PE** in patients with a D-dimer level above 2590 ng·ml.

- **D-dimer** testing is ***insufficiently accurate*** to be used as **a standalone test** in the diagnosis of PE.

- In patients with a ***low D-dimer*** (usually, a **threshold of 500 or 1000 ng·ml** is applied), PE can ***safely be ruled-out*** without CTPA. In contrast, in those with a ***D-dimer above the threshold***, subsequent CTPA needs to be performed.

- Whether similar ***D-dimer thresholds*** can be applied **in COVID-19** patients suspected of PE is **unknown**, because COVID-19 triggers ***a hyperinflammatory state*** with endothelial activation and high D-dimer levels.

سپاس از حسن توجهتان