COVID-19/TB: Diagnostic Delays

and

Unrecognized Risk of Progression of LTBI to Disease

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Factors of Delayed TB Diagnosis

- Patients afraid of seeking care
- Facilities were locked down
- Patients with TB were missed while the focus was on

COVID-19





A partnership hosted by UNOPS

12 Months of COVID-19 Eliminated 12 Years of Progress in the Global Fight Against Tuberculosis

Pandemic response pushed aside tuberculosis outreach and services, resulting in 20% drop in diagnosis and treatment worldwide, urgent recovery needed

Case Study by Jeanne Salinas

COVID/TB

Unrecognized Risk of Progression from LTBI to TB Disease

PART II





What is New in Covid-19 Studies Regarding Immunity ?

- Reduction and functional exhaustion of T cells
- The cytokine storm immune system responds to vigorously to the virus causing more harm than good

Reduction and Functional Exhaustion of T Cells in Patients With Coronavirus Disease 2019 (COVID-19)

Bo Diao^{1†}, Chenhui Wang^{2†}, Yingjun Tan^{1†}, Xiewan Chen³, Ying Liu⁴, Lifen Ning Li Chen¹, Min Li¹, Yueping Liu¹, Gang Wang¹, Zilin Yuan¹, Zeqing Feng², Yi Zha Yuzhang Wu^{2*†} and Yongwen Chen^{2*†} How the Coronavirus Short-Circuits the Immune System

In a disturbing parallel to H.I.V., the coronavirus can cause a depletion of important immune cells, recent studies found.

LTBI Becomes Active with Immunosupression



An SDSU TB researcher is concerned that COVID-19 could activate latent tuberculosis or TB in people who may be aware they have it.

Tuesday, September 22, 2020

COVID-19 Could Activate Latent Tuberculosis

COVID-19. It worries an SDSU researcher and TB expert.

Respir Med Case Rep. 2021; 32: 101344. Published online 2021 Jan 20. doi: 10.1016/j.rmcr.2021.101344 PMCID: PMC7816563

PMID: <u>33495728</u>

COVID-19 promoting the development of active tuberculosis in a patient with latent tuberculosis infection: A case report

Mohammed Khayat,* Hanan Fan, and Yusuf Vali

Am J Pathol. 2021 Jul; 191(7): 1255–1268. Published online 2021 Apr 19. doi: 10.1016/j.aipath.2021.03.011 PMCID: PMC8054533 PMID: 33887214

Coronavirus Activates an Altruistic Stem Cell–Mediated Defense Mechanism that Reactivates Dormant Tuberculosis

Implications in Coronavirus Disease 2019 Pandemic

Lekhika Pathak,* <u>Sukanya Gayan</u>,* <u>Bidisha Pal</u>,*[†] <u>Joyeeta Talukdar</u>,* <u>Seema Bhuyan</u>,* <u>Sorra Sandhya</u>,* <u>Herman Yeger</u>,[‡] <u>Debabrat Baishya</u>,*[§] and <u>Bikul Das</u>*[†]*

By Padma Nagappan

13 million People in USA have Latent TB Infection



Case Study by Marybel Monreal

Case Study: Post COVID-19

Case Presentation

- 42 yo F from Philippines, entered U.S. in 2008
- Pt reported feeling fine until mid January 2021 when she began having a cough
- 1/21/21: COVID-19 test positive
- 1/22/21: developed SOB
- 1/23/2021: admitted to hospital
 - \circ Intubation
 - o Candidemia
 - o Bacteremia
 - Acute kidney injury
- 2/22/21: patient improved and was discharged home on 3LO₂





Case Presentation:

Post hospital discharge

- Pt reported feeling weak, requiring the use of a walker
- Continued productive cough
- SOB with minimal exertion
- Still required 2-3L O₂



Persistent symptoms after COVID-19 case







Case Presentation

7 days after hospital discharge:

• 3/1/2021: patient suffered a syncopal episode and woke up in the ICU



- CT scan ruled out embolus however it did show extensive bilateral new pulmonary opacities not c/w resolving coronavirus
- Bronchoscopy with BAL smears for fungi and AFB resulted negative
- 3/4/2021: sputum culture **positive for MTB**, no rifampin resistance detected
- 3/5/21: d/c home on empiric levofloxacin 750 mg daily x 7 days and fluconazole x 30 days.

Case Presentation

- 3/26/21: Seen by the local Health Department
 - Collected induced sputum and CXR

• **Hx:**

- No known TB exposure or prior TB diagnosis
- Last traveled to Philippines in 2010; frequent visitors from Philippines
- Diagnosed with Type 1 diabetes in 2017 (treated with metformin and insulin; HbA1c: 10%)

Results:

- T-Spot (+), sputum 3/26, 3/28 (+) for MTB, CXR: increased interstitial prominence in both lungs
- 3/30/21: RIPE started for pan susceptible, bilateral pulmonary TB, non cavitary x 6 months



Let's Think...

- Did this patients complicated course of COVID-19 increase her risk of progressing to active TB disease?
- What impact did the stress of COVID-19 have on the patient's body?
 - Intubation
 - Prolonged ICU care
 - High dose steroid use
 - Immunological suppression
 - Malnutrition
 - Organ failure (AKI)
- What about underlying risk factors, i.e., foreign born, diabetes, LTBI



Individuals at Increased Risk for **Progression** to TB Disease:

- ✓ Persons with HIV
- ✓ Those with a history of prior, untreated TB or fibrotic lesions on chest radiograph
- ✓ Children \leq 5 years old with a positive TST
- ✓ Underweight or malnourished persons
- ✓ Substance users
- Those receiving TNF-α antagonists for treatment of rheumatoid arthritis or Crohn's disease
- Those with certain medical conditions
 - DM, CKD, Immune suppression, solid organ transplant, GI surgery





How COVID-19 May Precipitate Progression:

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COVID-19 Risk Factors

✓ Stress of Severe Illness

- ✓ Protein/calorie malnutrition
- ✓ High dose steroids
- ✓ Immune suppression
- ✓ Poor glucose control
- ✓ Organ failure (especially AKI)

Patient Interview

What About Patient-Centered Care?



In Summary:

- The COVID-19 pandemic has impacted the diagnosis of TB
- It may be that we will start to see more patients who had COVID-19 develop TB disease.
- Nurses have the continued responsibility to advocate for patients when they **think TB** (e.g., continued COVID symptoms)
- COVID-19 as a risk factor for progression to active TB disease. Nurses must be vigilant when ruling out active TB disease in patients with a history of COVID-19.
- Patient-centered care continues to play a major role in the successful treatment of patients with COVID-19 and TB disease
- Heartland Fact Sheet

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