International Journal of Science and Research (IJSR)
ISSN: 2319-7064
SJIF (2022): 7.942

COVID - Associated Pulmonary Aspergillosis - A Case Series

Dr Aanal S Desai[1], Dr Darshan J Kanani[2], Dr Yashvi Shah[3], Dr Siddharth Panchal[4], Dr Prerak Maniar[5]

2nd Year Medicine Residents, SVPIMSR, Ahmedabad, Gujarat, India

Abstract: ***Introduction****: The novel coronavirus disease (COVID-19) is a potential devastating disease with varying presentation from asymptomatic to critically ill patients. Patients are susceptible to fungal and bacterial infections due to low immunity and concurrent use of steroids. Aspergillosis is a life threatening fungal disease which can involve brain, lungs and other organs of the body causing life threatening illness. Methods and statistical test - Observational study Conclusion: Aspergillosis is a rare but fatal infection which can involve COVID-19 active cases as well as in recovered COVID-19 patients, especially those having uncontrolled diabetes and who were treated with large doses of corticosteroids which can involve brain, lungs, intestine and other organs.*

Keywords: CAPA, aspergillosis, COVID-19, SARS COV-2, Aspergillus, novel coronavirus, superinfection, co-infection, risk factors, prevalence, challenges, immune response

Case 1

65 Years old Male

Chief Complaints of

- Fever
- Difficulty of breathing for 2 days

COVID-19 RT-PCR Positive

Vitals on Admission:

- No fever
- Pulse-100/m
- Blood Pressure-130/80 mmhg
- SpO2 73% on 15L o2
- Respiratory rate-30/min

Patient was started on IV steroids, Anti-coagulation Ventilatory support in the form of NIV was initiated Patient responded to treatment and O2 support was tapered.

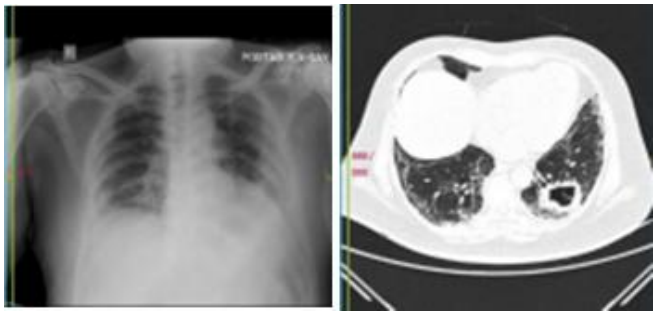
In the 3rd week of illness

TLC: 22.67
N/L: 94/1
PCT: 8.41
HRCT: Thick walled cavitary lesion

Serum Beta-d glucan and Serum Galactomannan were sent: STRONGLY POSITIVE

Diagnosis: Invasive Pulmonary Aspergillosis

Patient was started on Voriconazole to which he improved and was discharged with stable vitals



Case 2

40 Years old Female

Diagnosed with mild COVID-19-Given Home based Treatment

4 Weeks later

She developed altered sensorium along with Hypoxia and was admitted to the hospital

Investigations:

CBC: 12.8/10.47/267
N/L: 84/2
Procalcitonin: 5.72
HRCT: Multiple bilateral cavitary lesions
CT BRAIN: Non enhancing lesion
Serum Beta-D Glucan and Serum Galactomannan was sent: STRONG POSITIVE

Case 3

38 Years old Male admitted with severe COVID-19

No Fever
Pulse – 124/min
Blood Pressure – 124/80 mmHg
SpO2 – 84% on room air
RR – 22/min

Systemic examination – Few crepitations in left LZ

Pt was started on iv steroids, anticoagulation and HFNC support

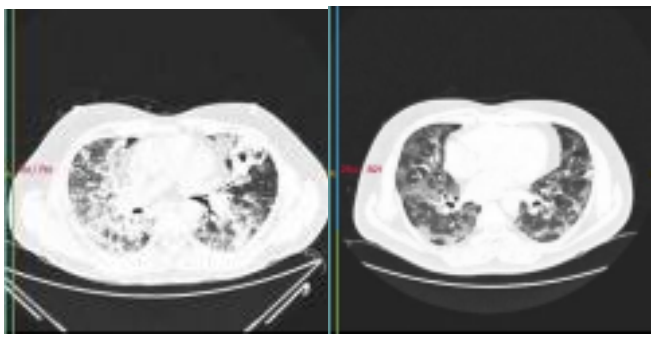
In third week of illness:

Respiratory distress increased

WBC-26000
Procalcitonin 11.7
HRCT-Cavity in left lower zone surrounded by dense consolidation
Serum Beta-D Glucan and Serum Galactomannan was sent: STRONG POSITIVE

Diagnosis: Invasive Pulmonary Aspergillosis + Fungal Brain Abscess

Voriconazole was initiated but patient died due to Septic Shock, AKI and Raised ICT



Diagnosis: Invasive Pulmonary Aspergillosis
Voriconazole was started but patient died due to septic shock and AKI

Invasive Aspergillosis

Opportunistic infection following respiratory viral infection has been recognized since the 1918 influenza pandemic.

Other respiratory viruses, including parainfluenza virus and respiratory syncytial virus, have similarly been found to predispose patients to invasive pulmonary aspergillosis.

Mechanism of infection may range from:

- Direct damage to airway epithelium ◦ Disruption of normal ciliary clearance
- Lymphopenia/Leukopenia
- Transient defects in cellular mediated immunity
- Immune dysregulation associated with ARDS may further predispose to opportunistic infections

Invasive Aspergillosis in COVID-19:

Factors predisposing to fungal diseases are commonly observed in symptomatic patients that include ◦ Leukopenia

- Lymphopenia
- Utilization Of glucocorticoids
- Host Immune Dysregulation

It is plausible that this immune dysregulation and/or lung damage stemming from COVID-19 immunopathology facilitates Aspergillus superinfection in a way that is at least partially distinct from other respiratory viruses.

Diagnosis:

As clinical feature of invasive pulmonary Aspergillosis overlaps with those of COVID-19, a high index of suspicion should be maintained in patients with

- Radiographic features of aspergillosis
- Multiple nodules
- Cavitary disease
- Prolonged or relapsing respiratory failure ◦ Neutrophilic leucocytosis
- Positive pct in 3rd-4th week of illness

Diagnostic criteria include:
Proven influenza infection with clinical symptoms and a GM index of ≥1 on BAL or ≥0.5 on serum, or Aspergillus spp. cultured from BAL.

Treatment:

Treatment of Choice:

- Voriconazole 6mg/kg iv/po on day 1 then 4mg/kg iv/po q12h
- Isavuconazole 372 mg po/iv q8h for 6 doses and then 372 mg po/iv daily
- If resistance detected-Liposomal Amphotericin B 3-5 mg/kg/day iv

Conclusion

IPA can complicate severe COVID-19 pneumonia. The diagnosis of CAPA is often challenging and requires a high index of suspicion. A constellation of clinical, biochemical, to establish the diagnosis. Timely diagnosis and management are required for better outcomes.

References

[1] Guan WJ, Ni ZY, Hu Y, et al. Clinical characteristics of coronavirus disease 2019 in China. N Engl J Med.2020; 382: 1708-1720.10.1056/NEJMoa2002032-DOI-PMC-PubMed

[2] Koehler P, Bassetti M, Kochanek M, Shimabukuro-Vornhagen A, Cornely OA. Intensive care management of influenza-associated pulmonary aspergillosis. Clin Microbiol Infect.2019; 25 (12): 1501-1509.-PubMed

[3] Schauwvlieghe AFAD, Rijnders BJA, Philips N, et al. Invasive aspergillosis in patients admitted to the intensive care unit with severe influenza: a retrospective cohort study. Lancet Respir Med.2018; 6 (10): 782-792.-PubMed

[4] Buil JB, Meijer EFJ, Denning DW, Verweij PE, Meis JF. Burden of serious fungal infections in the Netherlands. Mycoses.2020: 1-7.10.1111/myc.13089-DOI-PMC-PubMed

5. Jamieson AM, Yu S, Annicelli CH, Medzhitov R. Influenza virus-induced glucocorticoids compromise innate host defense against a secondary bacterial infection. Cell Host Microbe.2010; 7 (2): 103-114.-PMC-PubMed