









**Figure 5: Showing necrosis of skin and soft tissue of hand and fore arm.**



**Figure 6: It exhibits the air crescent sign, cavitation in the right upper lobe and in the left upper lobe there are nodules of various sizes.**

**Gastrointestinal mucormycosis:** It is generally considered to be rare and is secondary to the ingestion of fungi. The stomach, colon, and ileum are the most prevalent sites of gastrointestinal mucormycosis and stomach being the most common. GI mucormycosis has also been reported in conjunction with other immune compromising illnesses such as AIDS, systemic lupus erythematosus, and organ transplantation in extremely rare occurrences. The features of gastrointestinal *mucor* cases vary depending on the site of infection. The most common symptoms are nonspecific pain in the abdominal and abdominal distention, as well as nausea and vomiting. Fever and hematochezia are also possible side effects. There has also been an intra-abdominal abscess discovered [7-10].

**Disseminated mucormycosis:** Disseminated variety of mucormycosis is not very common to see. Infection from the primary focus goes into the blood stream and spreads to other parts and organs of body, among disseminated variety brain is the most common type, others being heart, spleen, skin [11].

**Miscellaneous manifestations:** *Mucorales* agents have the ability to infect almost any part of the body. Among the absence of sinus infection, endocarditis, and pyelonephritis, brain involvement occurs on rare

occasions, primarily in intravenous drug addicts. Some cases of mucormycosis of bones, mediastinum, trachea, kidneys, and peritoneum have also been reported [8].

**Prevention of *mucor* in COVID patient:** The underlying risk factors for COVID associated mucormycosis must be addressed in order to prevent the disease:

- Aiming for the better control of blood glucose level in diabetics,
- Proper use of systemic corticosteroids,
- Systemic corticosteroids should be used correctly.

Avoiding the use of antibiotics, antifungals, and immune modulators that aren't needed. Proper care of equipment's used by numerous patients and hygiene should be maintained, Wound care that works (bandages, tapes used for endotracheal tubes, ostomy devices should be sterilised properly and changed on a regular basis), in health care institutions, proper line management is essential.

## DISCUSSION

The burden of this fungal illness can be decreased by good care along with early diagnosis and the use of antifungals drugs, followed by the use of superior therapeutics in the initial stages of the disease to prevent more disastrous consequences [10]. Prevention in immune compromised and proper care of secondary infection with early diagnosis is the key for the successful treatment outcome. Antifungal treatment and surgical debridement are the only two treatment modalities we know till date. Antifungal therapy includes drugs like Amphotericin B, Posaconazole, or Isavuconazole. Amphotericin B, Posaconazole, and Isavuconazole are administered intravenously and antifungals which can be given orally in *mucor* cases are Posaconazole, Isavuconazole. Fluconazole, Voriconazole, and Echinocandins are among the medications that do not function against the fungus that cause Mucormycosis [12,13]. The only antifungal medication approved for the treatment of Mucormycosis is Amphotericin B Deoxycholate (AmB). The Lipid Formulations of Amphotericin (LFABs), on the other hand, are much less nephrotoxic than AMB and can be safely supplied at higher doses for longer periods of time. For the treatment of Mucormycosis, LFABs appear to be safer and more effective than AmB. The therapy of choice is liposomal Amphotericin B at a starting dose of 5 mg/kg body weight (10 mg/kg body weight if CNS involvement is present). There are 50 milligrams in each vial. Normal saline incompatible with it, hence it should be diluted in 5% or 10% dextrose. It must be maintained for many weeks until a strong response and disease stabilisation are reached, after which oral Posaconazole (300 mg delayed release tablets twice a day for 1 day, then 300 mg daily) or Isavuconazole (200 mg 1 tablet 3 times day for 2 days, then 200 mg daily) can be used [14]. Antifungal treatment is continued till the resolutions of symptoms and till the active disease becomes radiological inactive. Mucormycosis has a host and site dependent response to antifungal medications, which is particularly problematic

in individuals with haematological abnormalities and HSCT recipients [8]. Surgical intervention is needed when the infection becomes aggressive or it was diagnosed in later stages of the disease, surgical debridement of all dead and contaminated tissue, it should be removed as soon as possible. Because the palate, parts of the nose, and parts of the eye may be removed during surgery, it can result in disfigurement. However, without such severe surgery, the prospects of survival are low [13]. Mucormycosis consequences are usually connected to the area of the body that was infected, but they can also occur in other parts of the body since the fungus typically spread to organs or tissues that come into direct touch with or are near the affected area. This includes blindness, pulmonary and gastrointestinal haemorrhages, meningitis, brain abscess, sepsis. To prevent these complications early initiation of the treatment is needed [15].

### CONCLUSION

Mucormycosis is a fungal infection which occurs as a secondary infection or in immune compromised state and is most commonly associated with corona virus infection. COVID-19 infection itself leads to immune compromised state but its mainstay treatment that is steroids further leads to more susceptibility to *mucor* fungus. Thus, mucormycosis is the most common secondary infection in COVID-19 recovering patients. Host susceptibility increases more when there is pre-existing debilitating conditions like hypertension, diabetes, cardiovascular diseases, haematological abnormalities, organ transplanted patients, out of which diabetes being the most important and the most prevalent risk factor for the occurrence of the disease. And by strict glycaemic control, disease occurrence can be prevented. It has different clinical manifestations and the disease can spread to any site of the body. Rhino cerebral mucormycosis is the most common presentation seen. As the disease has sudden onset and rapid progression, early detection of the disease is important for which high resolution CT scan plays a vital role, culture biopsy can also be performed for the confirmation of the diagnosis. Because of its rapid progression and variable manifestations and different host response to anti-fungal, the outcome becomes highly unpredictable with increased rates of mortality. Surgical debridement of the diseased tissue or part or organ becomes necessary for the survival of the patient along with the use of antifungal therapy. IV Liposomal Amphotericin is the antifungal of choice as it is least nephrotoxic and more effective, after symptoms subside oral Posaconazole can

be started. The prognosis of the disease is poor thus prevention from the disease can only save the patient from complications.

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