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A Rare Case Study to Understand the Path of Post Dengue Mucormycosis

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Abstract

Mucormycosis is a rare form of opportunistic and third most common fungal infection which is aggressive in nature and frequently fatal. The infection is chronic, persisting for years, attributed by immunocompromised status of the patients with poor oral and nasal hygiene. A case study attempted to understand the path of Mucormycosis in a case of post dengue infection admitted at the tertiary care hospital. Interview with the case and caretaker and the case file review was done to collect the data. This is the case of rhino- orbital Mucormycosis attributed by uncontrolled blood sugar during treatment of dengue infection, the disease progression has been triggered by ignorance from the health care personnel's & the patient's unhygienic practices. Unsafe and infected environment of the hospital made her immunocompromised and vulnerable due to dengue and gave the chance of disease progression.

Keywords: Dengue, Mucormycosis, Uncontrolled Diabetes, Fever, Hospital, Immunocompromised

Introduction

Mucormycosis was discovered by German pathologist Paltauf In 1885[1] and the term Mucormycosis coined by R.D. Baker.[2] It is an insidious fungal infection caused by members of Mucorales and Zygomycotic Species. Infections with Mucorales are categorized by rapid progression. The major risk factors for Mucormycosis include uncontrolled diabetes mellitus, treatment with corticosteroids, organ or bone marrow transplantation, neutropenia, trauma, burns, malignant hematologic disorders and deferoxamine therapy in patients receiving haemodialysis.[3]

Dengue is an infectious disease caused by dengue virus serotypes: DENVs 1–4.[4] Infection with DENV results in varying degrees of pathological conditions, ranging from mild asymptomatic dengue fever (DF) to severe dengue haemorrhagic fever (DHF) and dengue shock syndrome (DSS) which may turn fatal. DF is a self limiting fever, lasting usually for 5–7 days.[5] Treatment is usually symptomatic. Due to the associated comorbidities and immunocompromised status, these patients are prone to develop severe opportunistic infections. Mucormycosis followed by dengue fever is the rarest form of opportunistic infection. Therefore, it is an attempt to understand

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the path of Mucormycosis in a case of post dengue infection admitted at the tertiary care hospital with the hope to add knowledge in this regard to the clinicians, epidemiologists and policy makers. That will be a road map for further research in future.

Case Description

A 42 year female with the history of three days fever reported to a trust hospital on 7th of october 2021 when she didn't relieve by paracetamol at home. Where she found positive for dengue NS1 and stayed there for seven days. The case has been treated symptomatically for dengue fever with paracetamol, salmeterol, cefoperazone & sulbactam, fluid supplementation, pantoprazole & platwell tablet. She is a known case of type 2 diabetes meliteus since 4 years but not on regular medication. She is asthmatic too since 8 years for which she was taking asthalin inhaler 1-2 times in a day during the episodes. On 13thoctober she reported ptosis on right eye, pain and swelling on right side of the face, difficulty in eye movements later diminution of vision of same eye, black purulent discharge from both nasal cavity & right-side jaw pain (figure1), but health care staff told her that this all was because of medication she was taking and discharged her on 16th of October. On 17th of October she visited to a private hospital where she was told to get admitted in medical college hospital in view of suspected mucormycosis. In medical college hospital she was found with raised blood sugar (11.3g/dl HB1AC and 278mg/dl RBS). Treatment started with liposomal amphotericin B 3.5 mg, i/v Posaconazole 300mg od, insulin 30 IU, inj piptaz 4.5 mg, clindamycin 400mg, inj tramadol 1 amp, inj metrogyl 400 mg, inj aciloc 1 amp. On 19thOctober, she went through Cone beam computed tomography (CBCT) of Maxilla &Mandible and found with b/l maxillary sinuses thickening and blockage by osteomeatal complexes, demineralization & thinning of the right maxillary sinus, mucosal thickening of b/l ethmoid, sphenoid and frontal sinuses, chronic pan sinusitis with generalized periodontitis. On 21st of October she got operated with right Caldwell-Luc (CWL) operation with endoscopic debridement under GA. On 29th October MRI Brain, Orbit & PNSwas done & found moderate mucosal thickening of b/l maxillary, ethmoid, sphenoid and frontal sinuses with post-operative changes. Histopathology report of 25th October showed necrosis with mucormycosis. KOH mounting on 10th November revealed growth of aspergillus fumigatus. On the 20th November second endoscopic debridement under GA was done. Contrast enhanced MRI (CEMRI) of Brain with Orbit /PNS was done on 22nd November & found post-operative changes. Repeated KOH mounting of 23rd November showed absence of any fungal elements. During the treatment blood sugar was maintained within the limit by proper sugar monitoring & medication. After the successful treatment she was discharged on 8th of December.

Figure.1. Presentation of Mucormycosis in Case

Discussion

It was the case of post dengue Rhino-orbital Mucormycosis. Dengue causes fever and increases metabolic rate, which can lead to a rise in fluctuation in blood sugar levels, as it was found in our case study with the very high HB1AC & FBS during the time of admission and after the recovery of dengue. If it is not monitored properly, there is high risk of such patients developing serious complications. The pathogenesis of Mucor mycosis in dengue could be due to lowering down of platelet counts up to the 50,000 along with steroid therapy and immunocompromised status like diabetes, renal disease, hepatocardiac disorders make such patients vulnerable for Mucormycosis.

A similar case was also reported on 15th November in TOI at Delhi where 49-year male had sudden loss of vision in one eye after 15 days of recovery from dengue was confirmed case of mucormycosis.

Similarly, another case of post dengue Mucormycosis was reported on 29thOctober 2021 at Indore, India in a50 year old male who recovered from dengue and developed mucormycosis after 1 week.

It was stated by treating doctors that post dengue Mucormycosis is a rare combination. The common point was noticed that in our case and reported case from Indore, post dengue Mucormycosis occurred after 7 days while the case at Delhi it was after 15 days. All of them were in a middle age group.

Another case study of Telangana, India was reported *by* Afroze SN, Korlepara R, Rao GV, Madala J about where the case who was 50 year female with uncontrolled diabetes and asthma along with complaints of pain and swelling on her right side of the face which was confirmed as a case of mucormycosis by a paranasal sinus view (PNS) radiograph, computed tomography (CT) and microscopic examination under haematoxylin& eosin stain.[6]

We've also observed during the 2nd wave of covid-19 pandemic at Jabalpur and neighbouring districts where more than 200 cases were reported with post covid Mucormycosis with most prevalent history of uncontrolled diabetes, steroid and oxygen therapy.[7]

Another unique case reported by Sabobeh T, Mushtaq K, Elsotouhy A, Ammar AA, Rashid S.at Doha, Qatar where Mucormycosis occurred along with hepatitis C, liver cirrhosis and diabetes. [8]

The evidences related with post dengue Mucormycosis with immunocompromised status of the cases clearly demonstrate that individuals who lack phagocytes or have impaired phagocytic function are at higher risk of Mucormycosis. Diabetes mellitus tends to change the normal immunological response of body to any infection in several ways. Hyperglycaemia stimulates fungal proliferation and also causes decrease in chemotaxis and phagocytic efficiency which permits the opportunistic organisms to thrive in acid-rich environment.

In the present case uncontrolled diabetes has been weakened her immunity which was attributed by dengue. Her weak immunity gave the favourable chance to disease to get develop. Her hospital stay was failed to provide her safe and spore free environment & clear the way of Mucormycosis and also negligence towards symptoms reported by the case.

Therefore, the need of more research in view of dengue complications including Mucormycosis and to rule out infection as early as possible to avoid further complications.

Conclusion

This post dengue rhino- orbital Mucormycosis case was attributed by uncontrolled blood sugar during treatment of dengue infection, ignorance from the health care personnel along with patient's unhygienic practices. Late diagnosis lead disease progression with worsening of symptoms**.** It's advisable not to ignore warning signals reported by the patients in order to save their lives and co-morbidities. The early diagnosis, prompt care and required treatment with essential surgical intervention and proper monitoring and management of blood sugar are some imperative steps for the successful & speedy recovery of the patient.

Ethical clearance- Ethical Clearance had been taken from the Institutional ethics Committee, Netaji subhash Chandra Bose, Jabalpur. Study was conducted as per World Helsinki Declaration. Reference/approval number - no.IEC/2021/7231-64, Approval date - 22 September 2021. Written informed consent was obtained from the Patient.

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