“ZYGOMYCOSIS (MUCORMYCOSIS) AND REVIEW OF THE LITERATURE”

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Abstract : Mucormycosis is an oppourtunistic fungal infection due to organism ot the zygomycetes class and the order of Mucorales that can cause various types of infections. Fungal infection is an uncommon complication after renal transplantation we describe a rare form of Mucormycosis in the renal graft. An infected large perigraft collection was drained, but the patient became anuric and septic. Mucormycosis is an emerging invasive fungal infection, primarily affecting immunocompromised patients. Pulmonary mucormycosis is relatively uncommon but an important opportunistic fungal infection in immunocompromised persons. Among immunocompromised patients, an important clinical emergency could be represented by mucormycosis. Zygomyosis is a rare fungal infection seen most often in associated with prolonged neutropenia. According to the latest recommendations diagnosis is based on direct examination of clinical specimens, and or histopathology, and culture. We performed a Pubmed Search on reports of patients with mucormycosis treated with Posaconazole.

Key words: Immunocompromised patients, rhinocerebral mucormycosis, diabetes mellitus, posaconazole, etc.

I. Introduction :-

Infection is the major cause of death in this patient population [1]. Indeed in a recent autopsy study 102 renal transplant recipients, fungal infection were responsible for 27.5% of infectious deaths[2]. Mucormycosis is usually a rapidly progressive and frequently fatal infection in renal transplant patients[3]. Rarely mucormycosis developed in the kidney allograft itself[4]. Mucormycosis referre to a spectrum of disease presentations caused by fungi of the class Zygomycetes, order Mucorales. These ubiquitous organisms are common in habitants of decaying matter (e.g. moldy bread). The vast majority of mucormycosis infections have been described in patients with systemic or local conditions that are associated with a severely immunocompromised state (e.g. diabetes mellitus, HIV, malignancies chemotherapy, burns etc.][1]. Mucormycosis has been reported in recipients of kidney, liver, lung, heart and bone marrow transplants [5]. The fungus enters the body through either the respiratory tract, the digestive tract or a damaged skin barrier. Mucor infection within the renal graft as occurred in our patients, is a rare complication. We found only three previous reports of similar cases [4] [6]. Zygomyosis is the third most common causes of fungal infection after candidasis and aspergillosis[7][8]. Intestinal zygomycosis is extremely rare and it is difficult to obtain a histological diagnosis, although it may be possible by means of computerised tomography guided biopsy of abnormal mucosa[9]. Zygomyosis has a high mortality of 70-100 %, but some patients may be cured by surgical excision and Amphotericin. “ The diagnosis of Zygomycosis is rarely suspected and antemortem diagnosis is made in only 23-50 % of cases”. Zygomyosis is rare invasive fungal infection, which is most often seen in immunocompromised patients, particularly during prolonged neutropenia. It is caused by various members of the phycomycetes, such as rhizopus, mucor and absidia[7-10].
Gastrointestinal zygomycosis has been reported in neonates. It is presents as necrotising enterocolitis and invariably fatal [11][12]. In the neutropenic phase, inflammation of the ileum is often caused by typhilitis post chemotherapy. However, this condition resolves spontaneously when the neutrophil count recovers. Neutropenic fever can be common presenting feature of Zygomycosis [9-12]. The treatment of choice is amphotericin, preferably the lipid formulation, because adequate dosage can be delivered with reduced renal toxicity. The common prophylactic antifungal agents such as fluconazole and itraconazole are not active against the fungus[8-12]. The new triazole antifungal agent posaconazole, has been compared with amphotericin B, voriconazole and itraconazole in in-vitro studies. Posaconazole was significantly more active than voriconazole and other agents[7-10].

Mucormycosis refers to different diseases caused by fungal infection the most common organism is the Rhizopus species[13]. The major route of infection is through inhalation , and when the spores are deposited in the nasal turbinates , rhinocerebral disease developed,[14]. The rhinocerebral mucormycosis causes significant morbidity and requires rapid diagnosis with aggressive medical and surgical therapy[15]. According to anatomic localisation , mucormycosis can be classified as , Rhinocerebral , Pulmonary , Cutaneous , Gastrointestinal and Disseminated[16]. Most patients with rhinocerebral disease have diabetes (especially with ketoacidosis) and this was typically observed in our patients as he was developing COVID-19 infection[17].

As it was shown that the mortality rate of rhinocerebral mucormycosis is possibly reaching 50-70 % and the mortality rate associated with disseminated disease is approaching 100 % [18]. Disseminated mucormycosis involving the lungs and brain at Post-mortem study [19].

Risk factors-There are multiple risk factors for mucormycosis such as haematological malignancies and neutropenia , but the infections are also seen in transplant patients, diabetic patients or following trauma or burns [20]. The clinical presentation depends not only on the underlying disease , but also on the species involved[21]. Many species can cause mucormycosis and recently emerging and or new species have been reported , such as Saksenaea erythrospora or Rhizopus homothallicus [22][23]. Histopathology is also strongly recommended. Immunohistochemistry is possible by using monoclonal antibodies that are commercially available , but it needs trained personnel and specialized laboratories[24].

A communicable disease , also known as an infectious disease , could be defined as “an illness caused by a specific infectious agent or its toxic product that results from
transmission of that agent or it’s products from an infected persons, animal or reservoir to a susceptible host, either directly or indirectly through an intermediate plant or animal host. A vector or in animate environment. Infectious disease can occur as both endemic (disease constantly present in a population or in certain geographical area) and epidemic (sudden increase in the number of cases) higher than expected. When an epidemic is geographically very extensive and affects many individual of the population, it is called a pandemic. In recent years, mucormycosis, a fungal infection caused by Mucorales, is becoming an interesting and alarming phenomenon [26] because of the increase in cases, the high mortality rates, and the lack of effective antifungal treatments. In the past, it was considered a rare infection and limited to patients with severe immune alterations (for e.g.- Patients suffering from AIDS, diabetes, organ transplants, or other conditions associated with immunosuppression [27].

In recent years, the epidemiology of mucormycosis has shown an alarming trend especially in countries such as India & China, a rise in incidence especially among patients with uncontrolled diabetes mellitus has been observed [28]. The most frequently isolated from patients are Apophysomyces (A. variabilis), Cunnighamella (C. bertholletiae), Lichtheimia (L. corymbifera L. raosa), Mucor (M. circinelloides), Rhizopus (R. pusillus), and Saksenaea (S. vasiiformis) [27]. Pulmonary mucormycosis is relatively uncommon infection that occurs mostly in immunocompromised persons. The first case of pulmonary mucormycosis was described in 1876 by Furbringer [29].

Mucormycosis often subsumed under the term zygomycosis is a rare, but severe and often life threatening disease [30]. Rhinocerebral, pulmonary, cutaneous and disseminated infections are among the most common entities [34]. Disease is the most common of the so-called rare invasive fungal disease (IFD) [31]. However, insulin and non-insulin dependent diabetes mellitus play a major role as risk factors in some regions of the world, where they outnumber patients with iatrogenic immunosuppression [32]. Posaconazole is a well tolerated extended spectrum compound and exhibits in vitro activity against mucorales [33].

3. Signs & Symptoms:
Neutropenic fever can be common presenting feature of Zygomycosis [9]. Rhinocerebral disease may be manifest as unilatera headache, facial pain, numbness, fever, hyposmia & nasal congestion, which progresses the black discharge [17]. Patients may present with non specific symptoms such as fever, abdominal pain, & diarrhea [9].

4. Conclusion:
Pulmonary mucormycosis is a serious and life threatening condition specially if follow COVID-19 infection in immunocompromised patients with coexisting medical illnesses as a diabetes mellitus, and further imposed by heavy use of steroid, we need to ruminate on whether the patient develops the skin lesions and necrosis or neurological manifestations.

5. References:
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