

**A SURVEY TO ASSESS THE AWARENESS AND KNOWLEDGE OF POST GRADUATE STUDENTS ON MUCORMYCOSIS IN ANDHRA PRADESH – AN ONLINE SURVEY (PICK IT FAST SAVE PRECIOUS LIFE)****Padmini D.<sup>1\*</sup>, Rao BL<sup>2</sup>, Sudheer K.<sup>3</sup>, Krishna Teja G.<sup>4</sup>, Sai Kumar CD<sup>5</sup> and Mrudula AG<sup>6</sup>**<sup>1,4,5,6</sup>Postgraduate Student, Department of Prosthodontics, Lenora Institute of Dental Sciences, NTR University, Andhra Pradesh.<sup>2</sup>Professor & Head, Department of Prosthodontics, Lenora Institute of Dental Sciences, NTR University, Andhra Pradesh.<sup>3</sup>Professor, Department of Prosthodontics, Lenora Institute of Dental Sciences, NTR University, Andhra Pradesh.**\*Corresponding Author: Dr. Padmini D.**

Postgraduate Student, Department of Prosthodontics, Lenora Institute of Dental Sciences, NTR University, Andhra Pradesh.

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**ABSTRACT**

Mucormycosis is a severe opportunistic fungal infection caused by a fungus belonging to the Mucorales order. This fungal infection can spread quickly in those who are immunologically or metabolically impaired, such as patients who have recently suffered COVID19 infection. The most essential elements that impact prognosis in the management of Mucormycosis are early suspicion, fast diagnosis, and treatment commencement. This article describes the knowledge and awareness the post graduate students are having regarding Mucormycosis.

**KEYWORDS:** Mucormycosis, Black fungus, Amphotericin B, Survey, Obturator.**INTRODUCTION**

Mucormycosis was coined by R.D. Baker, an American pathologist. Zygomycosis is another name for it. It's a sneaky fungal infection spread by members of the Mucorales and zygomycotic families. Mucormycotina are saprobes that can be found in decaying materials or soil. Infections with Mucorales are categorized by rapid progression.<sup>[1]</sup>

Mucormycosis is an infection caused by fungi belonging to the order Mucorales.<sup>[2]</sup> *Rhizopus oryzae* is the most prevalent organism recovered from Mucormycosis patients, accounting for 70 percent of all Mucormycosis cases.<sup>[3]</sup> Uncontrolled diabetes mellitus in ketoacidosis, other forms of metabolic acidosis, corticosteroid treatment, organ or bone marrow transplantation, neutropenia, trauma and burns, malignant hematologic disorders, and deferoxamine therapy in haemodialysis patients are all major risk factors for Mucormycosis.<sup>[4]</sup> The pandemic coronavirus disease 2019 (COVID-19) is still a major issue around the world. While numerous therapeutic approaches have been investigated, none have been demonstrated to increase survival in COVID-19 save systemic glucocorticoids. The widespread use of glucocorticoids, unfortunately, might result in secondary bacterial or fungal infections. Mucormycosis, a kind of invasive pulmonary aspergillosis that complicates the course of COVID-19, is rarely noticed or diagnosed.<sup>[5]</sup>

**Need for the study**

With increase in incidence of Mucormycosis particularly being rhino-maxillary Mucormycosis type, patients might report primarily to general dental practitioners for oral cavity related complaints. Most of the times, these oral complaints may be misdiagnosed as general oral cavity related complaints. For this reason, every post graduate student must have awareness and knowledge on Mucormycosis – Clinical features, diagnosis and treatment options; so that early diagnosis and prompt treatment can be given to the patient.

**Aim of the study**

To assess the awareness and knowledge of postgraduate students on Mucormycosis in Andhra Pradesh.

**Objectives of the study**

1. To assess the awareness of postgraduate students on Mucormycosis in Andhra Pradesh.
2. To assess the knowledge of postgraduate students on Mucormycosis in Andhra Pradesh.

**MATERIALS AND METHODS**

After literature search, a questionnaire (Annexure I) was made and uploaded in google sheets. The email IDs of the students were obtained from the IDA state branch, District IDA branches as well different social media through Whatsapp groups, and the questionnaire was sent to email id's. This study was performed among

postgraduate students by conducting an online survey in the google sheet. A total of 19 questions were made, which were divided into three parts in which the first section contained questions regarding demographic data, the second section contained information regarding awareness about Mucormycosis, and the third section included questions regarding knowledge about Mucormycosis. The survey was conducted for 2 months of duration from 24-09-2021 to 24-11-2021. The google sheet was sent to about 250 email IDs and waited for about 2 months for the responses. At the end of 2 months, about 68 percent of the people responded, and 32 percent of the people did not respond. Of those 68% percent of the people who responded about 75% percent of them gave almost correct answers, and the rest of the people went wrong with few questions. Finally, the results were obtained in the form of pie charts and were represented systematically by using Docs Editors software in google forms.

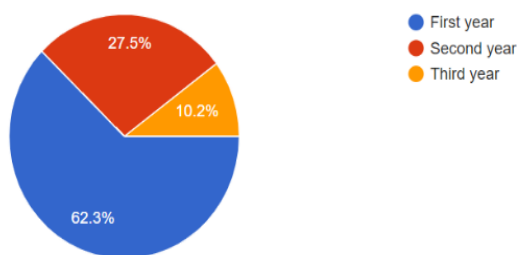
**RESULTS**

The results were obtained in the form of quantitative data, which was represented in the form of a pie chart for each and every question determining the frequency of answers according to the percentage obtained.

**Section I - Demographic data:**

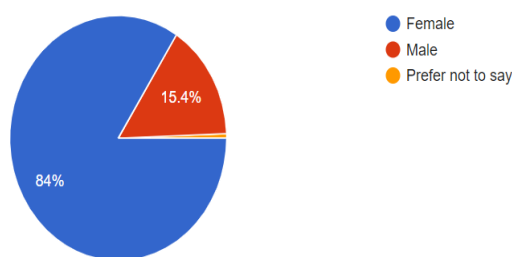
Among the 9 specialities, post graduates of prosthodontics are participated more in the survey.

**Graph I:** illustrates the year of post-graduation. More responses are given by the first year Post graduates nearly 62.3%, followed by second years 2.5 times that of the third years.



**Graph I**

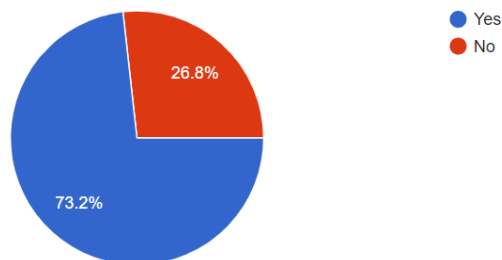
**Graph II:** gives information regarding gender. Females are involved 5.6 times more than that of males.



**Graph II**

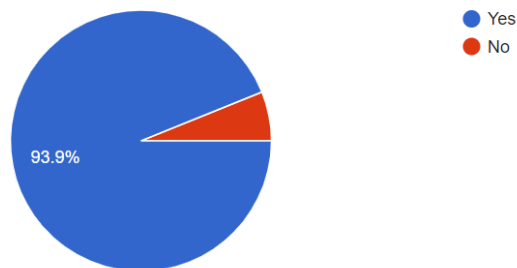
**Section II – Awareness of post graduate students on mucormycosis**

**Graph III:** depicts the students come across the case of Mucormycosis. About 73.2% of students have come across the case of Mucormycosis in their clinicals.



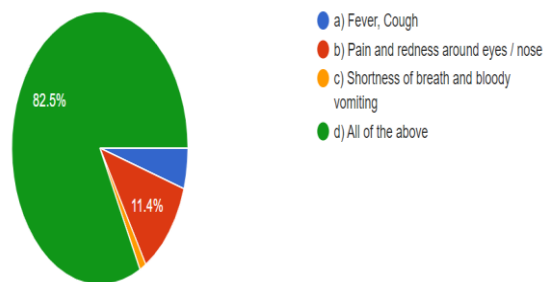
**Graph III**

**Graph IV:** designates the about how many of the post graduates knows that common name of Mucormycosis is Black Fungus. Majority of the students knows that the common name of Mucormycosis is Black Fungus with exception of 6.1%.



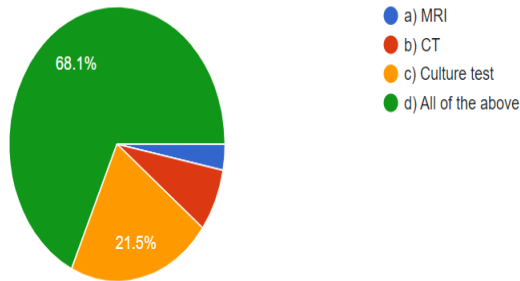
**Graph IV**

**Graph V:** illustrates about the symptoms of Mucormycosis. 82.5% of individuals gave response as fever, cough, Pain and redness around eyes / nose, Shortness of breath and bloody vomiting, on the other hand 11.4% felt that common symptom of Mucormycosis as Pain and redness around eyes / nose and 4.8% as fever and cough, 1.2% as Shortness of breath and bloody vomiting.



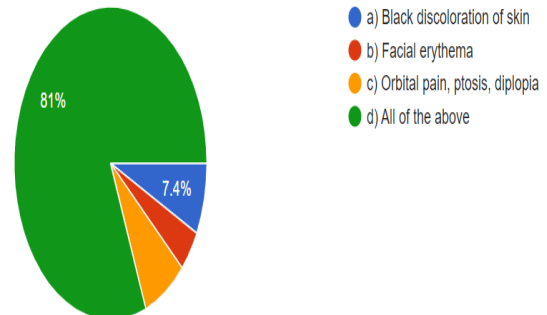
**Graph V**

**Graph VI:** implies for investigations for Mucormycosis. 68.1% of post graduates felt that the investigations for Mucormycosis are MRI, CT, Culture test where as 21.5% gave response as culture test and 7.4% as CT and 3.1% as MRI.



Graph VI

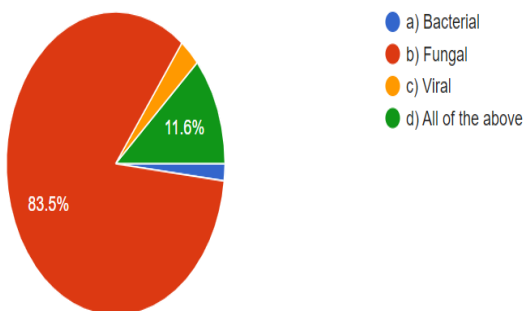
**Graph IX:** depicts about extra-oral findings observed in Mucormycosis. 81% felt as blackish discoloration of skin, Facial erythema, Orbital pain, ptosis, diplopia and at the same time 7.4% gave reply as blackish discoloration of skin, 7.4% as Orbital pain, ptosis, diplopia, 4.3% as Facial erythema.



Graph IX

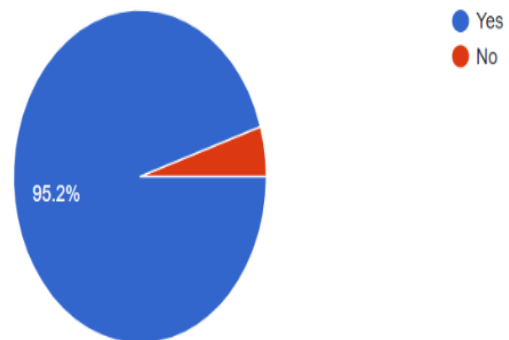
**Section III – Knowledge of post graduate students on mucormycosis**

**Graph VII:** defines about etiological agent of Mucormycosis. Nearly 83.5% gave reply as Fungal aetiology on the flip side 11.6% felt that Mucormycosis etiological agents as complex of Bacterial, Fungal and Viral agents. Minor percentage felt as either Bacterial and Viral infection.



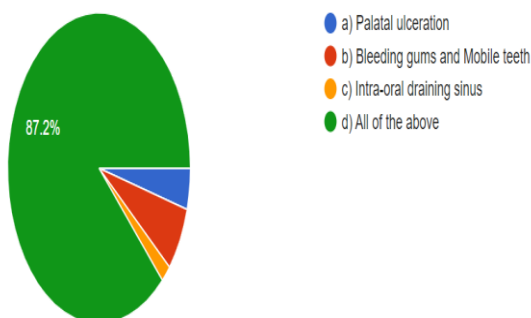
Graph VII

**Graph X:** mentioned about role of predisposing factors. Almost 95.2% felt that there is a role of predisposing factors oppositely 4.8% felt that there isn't any role of predisposing factors.



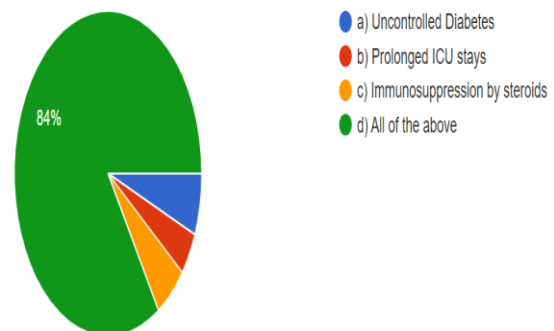
Graph X

**Graph VIII:** shows about intra-oral findings observed in Mucormycosis. 87.2% reacted as Palatal ulceration, Bleeding gums and Mobile teeth and Intra-oral draining sinus on the other side of coin 6.7% as Bleeding gums and Mobile teeth, 4.3% as Palatal ulceration, 1.8% as Intra-oral draining sinus.



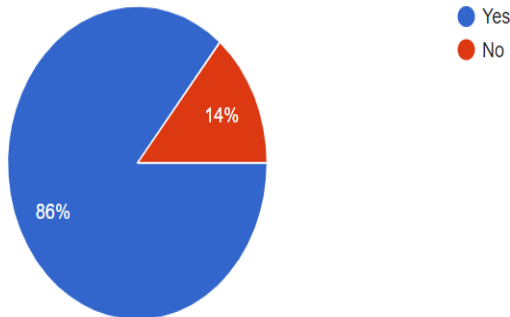
Graph VIII

**Graph XI:** illustrates about predisposing factors for Mucormycosis. Nearly 84% replied as Uncontrolled Diabetes, Prolonged ICU stays and Immunosuppression by steroids as predisposing factors for Mucormycosis nonetheless 6.1% as Uncontrolled Diabetes, 5.5% as Immunosuppression by steroids and 4.3% as Prolonged ICU stays.



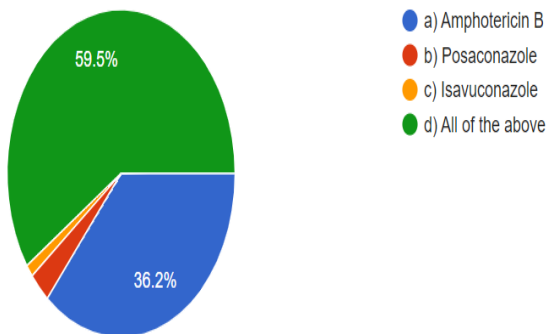
Graph XI

**Graph XII:** reveals about the correlation between Corona virus and Mucormycosis. Almost more than 5/6<sup>th</sup> of the Post Graduate students i.e., 86% thought that there is a positive correlation inversely rest felt there no role of Corona virus in the incidence of Mucormycosis.



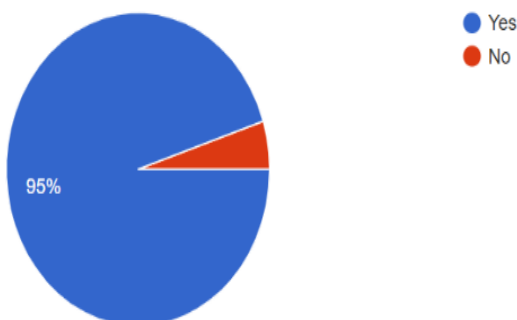
**Graph XII**

**Graph XIII:** depicts about the medication of Mucormycosis. 59.5% of students gave response as Amphotericin B, Posaconazole and Isavuconazole as drugs for the treatment conversely 36.2% as Amphotericin B, 3.1% as Posaconazole and 1.2% as Isavuconazole.



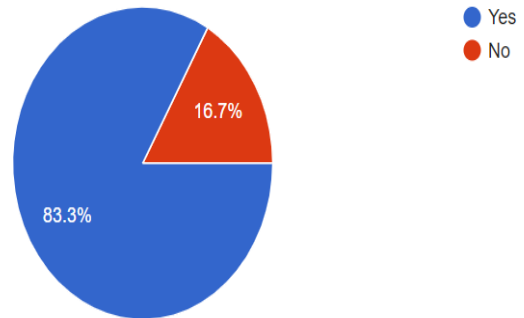
**Graph XIII**

**Graph XIV:** illustrates about necessity of surgical debridement. Nearly 95% of responses are given as surgical debridement is necessary yet 5% gave response as surgical debridement is not necessary.



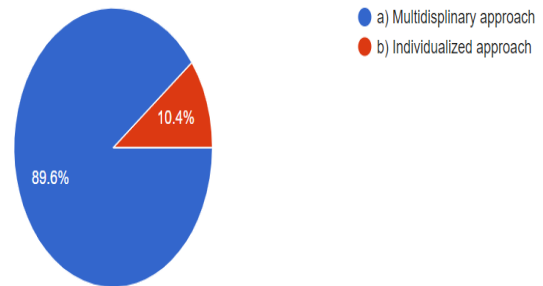
**Graph XIV**

**Graph XV:** mentioned about recurrence of Mucormycosis. 83.3% of individuals felt it as a recurring disease alternatively 16.7% as non-recurring disease.



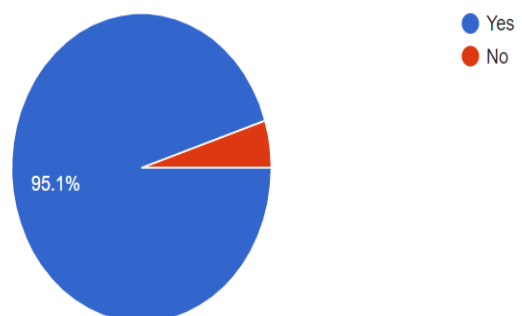
**Graph XV**

**Graph XVI:** reveals about approach for Mucormycosis. 89.6% of students felt as Multidisciplinary approach and 10.4% as individualistic approach.



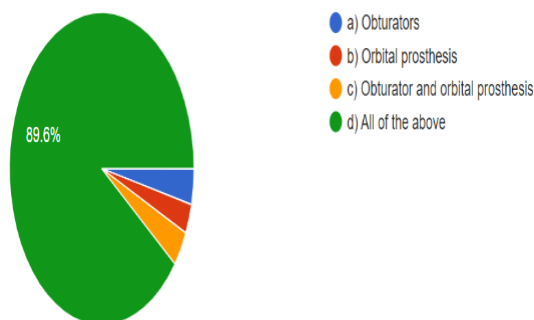
**Graph XVI**

**Graph XVII:** defines about post-surgical treatment options for Mucormycosis. 95.1% of Post Graduate students knows that there are post-surgical treatment options for Mucormycosis contrary 4.9% don't know that there are post-surgical treatment options for Mucormycosis.



**Graph XVII**

**Graph XVIII:** mentioned about post-surgical treatment options for Mucormycosis. 89.6% replied as Obturators, Orbital prosthesis, both Obturators and Orbital prosthesis as treatment options however 3.7% as Obturators, 3.7% as both Obturators and Orbital prosthesis and 3.1% as Orbital prosthesis.



Graph XVIII

## DISCUSSION

'Mucormycosis' - The Black fungus has emerged as a new challenge for doctors. The Covid-19 pandemic has wreaked devastation on the world's population and health-care system. In India's second wave, post-Covid Mucormycosis has exploded, and we're seeing a large number of cases every day in the OPD. A Covid survivor who has already been through an illness that affects practically all of the body's systems must now contend with a lethal fungus infection. This is like a frying pan to fire scenario for the patient. Most common type of Mucormycosis being rhino-maxillary disease patients might report primarily to general dental practitioner for oral cavity related complaints.

Mucormycosis is an opportunistic, potentially lethal, angioinvasive fungal infection predisposed by uncontrolled diabetes mellitus, corticosteroids, immunosuppressive therapy, primary or secondary immunodeficiency, haematological malignancies, haematological stem cell transplantation, solid organ malignancies, solid organ transplantation, and iron overload.<sup>[6]</sup> Intravenous drug use, human immunodeficiency virus infection, renal failure, liver illnesses, persistent alcoholism, and malnutrition and low birth weight in the paediatric population are also less common risk factors. According to studies in the Indian population, post-pulmonary TB and chronic kidney illness are emerging risk factors.<sup>[7]</sup> It can affect the nose, sinus, orbit, central nervous system, lung, gastrointestinal tract, skin, jaw bones, heart, kidney, and mediastinum.

Rhino-orbital-cerebral Mucormycosis is the most common presentation, contributing to about two-thirds of all cases of Mucormycosis.<sup>[8]</sup> The spores are inhaled into the nasopharynx and tissue invasion, thrombosis, and necrosis progresses from the nose, to the para nasal sinus, orbit, and CNS. The prevalence has been estimated to be 0.005–1.7 per million population worldwide before the pandemic. The prevalence in India has always been much higher, nearly 80 times that in other parts of the world, 0.14 per 1000.<sup>[9]</sup>

Incidence of Rhinocerebral Mucormycosis is 33 – 50%.<sup>[10]</sup> According to Lanternier F et al., this infection shows varying clinical appearance with increased

incidence of primary skin infection and a significant prognosis predisposed by localization.<sup>[11]</sup>

Mucormycosis diagnosis entails a careful examination of clinical manifestations, magnetic resonance imaging modalities, early-stage computed tomography (CT), expert assessment of cytological and histological provision, best use of clinical microbiological approach, and molecular detection.<sup>[12]</sup>

According to Kontoyiannis DP et al., Mucormycosis is difficult to diagnose because of its indefinable clinical presentation and repeated occult distribution, necessitating the use of a sensitive nonculture-based investigative method. Tissue-based analysis is the gold standard analytic technique for confirmation.<sup>[13]</sup>

Mucormycosis treatment comprises rapid correct diagnosis, surgical debridement, and medication administration, as well as supplementary use of hyperbaric oxygen, recombinant cytokines, or granulocyte and prosthetic obturator transfusions.<sup>[14]</sup> According to Spellberg B et al., currently available monotherapy has a high death rate, particularly in haematology patients, hence "combination therapy" for Mucormycosis is the best option.<sup>[14]</sup>

## CONCLUSION

COVID-19 disease is shaking the world. It had very fast dissemination over the globe, but with an appreciable recovery rate. In 70–80% of COVID-19 patients the severity of the infection is mild-moderate and recover without any other complications. However, in the remaining patients the infection is rather severe and the respiratory system may collapse. Those patients require external oxygen supply, corticosteroid administration and regular monitoring of blood glucose levels. The improper use or chronic usage of this treatment measures may lead to the development of other infections like Mucormycosis which may be fatal. Hence, early diagnosis and prompt treatment is needed. So, every Post graduate student should have awareness and knowledge regarding Mucormycosis for early diagnosis and for hinder its rapid spread.

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