

ISMM MYCOSES

Newsletter

Issue 25-June 2023



Message of the President

Dear everyone, connecting with all of you is a pleasure indeed. I am humbled, for your trust in me and the mandate I received to lead the ISMM. Thank you everyone.

To begin with –

Gratitude to the Council that completed a rather challenging extended tenure with patience and diligence. Their perseverance to the goals was outstanding.

Congratulations and huge thanks to the entire team led by Dr. Ranjana for the warm and endearing experience at Imphal. What an amazing conference it was. Her personal touch and organizational skills made the conference an outstanding one. This has definitely set a benchmark for the future events.

I also wish to place on record my sincere gratitude to Prof. Jean-Pierre GANGNEUX for contacting me at the behest of Dr. A. Chakrabarti and giving the ISMM EC members an opportunity with free registration to participate as online delegates in the 6th ECMM Educational Symposium on “**The fungal exposome and health issues**” held at Rennes France on the 22nd and 23rd July. This

event covered the entire intricate and dynamic Fungi - environment interactions, their role in disease manifestations and the need as well as methods of environmental surveillance.

Moving forward –

The number of mycology related programs conducted across the country in the past few months is a testimony to growing popularity of this niche area of infectious diseases. It stems from the need for expanding diagnostic expertise and advisory role in the management of fungal diseases both invasive and the chronic morbid ones. Friends, the faculty of ISMM definitely have a huge role to play and must take on the responsibility to strengthen the workforce. The council in its capacity will support every academic activity.

To address the need for better management of fungal infections, ICMR has supported establishment of Advanced Mycology Diagnostic and Referral centres across the country. I request each of these 8 centres to ensure collaborations with teaching and non-teaching healthcare facilities as well as public private partnerships

within their regions for efficient patient care.

I take this opportunity also to request faculty guides for postgraduate students to undertake mycology related theses work with challenging research questions and clinical relevance. This will make us future ready.

In the next couple of years this new team will strive hard to spread the mycology movement far and wide.

Best wishes and thank you all once again.



Jayanthi Savio
President, Indian Society of Medical Mycologists

Report of General Secretary

Hello everyone,

I hope all of our ISMM society members are doing well. To start off, I want to thank all of you for your trust in me as general secretary, and you have my promise that I will try my best to take our society to new heights during my tenure. Although it has been just a couple of months since I took over, we have already made a lot of progress, and will continue to do so.

Recently, we lost one of our mycology doyens, Dr. Anisetti Thammayya, who used to work in Calcutta School of Tropical Medicine as a mycologist and contributed immensely to Indian Medical Mycology. We at ISMM offer our condolences for this huge loss, and pay our respects.

After our team took over, we decided to conduct an Executive Council Meeting in the last week of every alternate month. We have already completed two meetings. The 1st ISMM EC council online meeting was held on 8th April, 2023. All the members participated virtually with special guest Prof. Ranjana Khurajam, who successfully organized the 14th National Biennial Conference of ISMM at RIMS, Imphal from 23-25th March 2023. She proposed initiating a few travel awards for future ISMM conferences. She indicated that she wanted to donate the savings from the conference to ISMM, and the interest generated from FD of the donated amount could be used for future ISMM travel grants. All members welcomed the decision, and also agreed to increase the social media presence of ISMM website and

activities to encourage student participation through webinars, video lectures and podcasts on different topics.

In the virtual ISMM meeting held on 19th May, 2023, Dr. Shukla Das (SD) sought an approval for using the ISMM account for obtaining sponsorship fund for holding a CME at Delhi on 6th Aug 2023 under the aegis of ISMM. Dr. SD confirmed that ISMM account would be used for all transactions including registration, sponsorships and other expenses. She also said that any surplus amount after closure of CME finances, would remain in the ISMM account. It was recommended that Dr. Harsimran Kaur would maintain a separate file to document this CME transactions. The members approved the request and encouraged to hold the CME.

Let's discuss some recent activities of our society. Pfizer kindly sponsored some money to ISMM to increase the awareness in the medical mycology field in our country. The society decided to conduct four workshops for faculty and students in four different regions over one year. The total life membership of our society has reached 600, but we must increase our reach and membership, especially from underrepresented regions. It is my sincere request to all EC members to work actively for increasing ISMM membership. The Society has decided to initiate a new membership drive soon. There is a lot to improve on our ISMM website, and I request all members to provide suggestions and ideas to make it more user-friendly and vibrant. The much-awaited

international conference, “11th Trends in Medical Mycology (TIMM)” is going to be held at Athens, Greece from 20-23 October, and I am sure many interested medical mycologists from our country will be participating to enrich their knowledge in the medical mycology field. Our next ISMM conference will be in 2025 at SRM Medical College, Chennai, and I am sure Dr. Anupama has already started to work to make it successful. We assure our full support to organize this important event.

I am signing off with my best regards and wishes.



Dr. Anup K Ghosh
Secretary, Indian Society of Medical Mycologists

1. Dr. M. J. Thirumalachar Life Time Achievement Award.

The Life Time Achievement award is established to honor members of the Society, who during the span of his/her life-time have demonstrated a longstanding commitment to the cause of Medical Mycology in India. The award is made possible by a generous donation by one of the senior most and revered member of the Society, Dr. Arvind A. Padhye,

The award would recognize the significant contribution to the understanding and application of the knowledge pertaining to the Medical Mycology in India, over the entire course of his /her life time, with a definable body of work through one or more of the following:-

- Teaching /Training.
- Research.
- Publications/patents.
- Patient care.

Who may receive the award?

The nominee should be a Life member of the Society in good standing, He should be in the field for at least 25 years but not necessarily active professionally at the time of receiving the award.

He must be alive at the time the selection committee's choice is announced. In case of an unfortunate event of death of the awardee after selection, the award may be presented posthumously.

How will the recipients be chosen?

The president, with the approval of the executive committee, will appoint a Life Time Achievement Awards committee consisting of five active members of the Society. One committee member shall be a current member of the SIHAM executive council, who would co-ordinate the committee meeting. The committee will invite nominations from the members for the award. The nomination is to be made by at least two life members of the society at least 6 months in advance to the next annual conference of the society. Self-Nomination will not be accepted.

The nominations will be scrutinized by the award committee and the best among the nominations will be selected for the award.

When will the award be presented?

The award may be presented to the deserving individual at the Annual Conference of the Society. The awardee will be introduced to the august gathering duly stating his/her achievements during the inaugural function of the Conference.

The award will consist of a citation and a memento.

No travelling or daily allowance will be provided to the awardee to attend the function.

The decision of the award committee will be final.

2. G. P. Agarwal young scientist Award

The best paper award will be given to a young scientist below the age of 35 years (proof of age to be submitted). Applicant must submit the full length original research paper on any area of the medical mycology. Oral presentation of the research should be done in the separate award session during the conference.

3. Dr. Pankajalakshmi Venugopal Glaxo Meritorious Award

Age limit -35 years (proof of age to be submitted). Must submit the curriculum vitae with list of publications and reprints of the papers in the field of medical mycology. Award will be given on the basis of the CV for the outstanding work in the field of medical mycology

4. Dr Kamalam Glaxo award

Applicant must submit full length research paper in duplicate in the field of dermatomycology. Award will be given based on oral presentation in the separate session during the conference.

Minutes of the General Body Meeting (GBM) on 24th March, 2023

- The GBM was held on 24th March 2023 at 2 pm in Jubilee Hall Regional Institute of Medical Sciences (RIMS). It was attended by executive council members and ISMM members.
- The meeting was presided by the ISMM President, Dr. Anupma J Kindo and Secretary, Dr. Jayanthi Savio.
- The secretary's report (Dr Jayanthi Savio) began with a note of thanks to the erstwhile committee members and to the organising committee of RIMS with special applause for Dr. Ranjana for conducting the ISMM conference at Imphal with passion and commitment. In preparation of the conference the council had conducted several online meetings.
- The name of Indian society of Medical Mycologists (ISMM) will be retained as agreed by all members.
- Dr. Savitri Sharma was thanked for having designed the new logo of ISMM that was accepted by all.
- This was followed by the treasurer's report (Dr. Anup K Ghosh) which was accepted-proposed by Dr. Gagandeep and seconded by Dr. Niranjan Naik. Dr. Chakrabarti suggested a change in the bank from Allahabad to State Bank of India for better monitoring and interest, however the council wanted to continue with the existing bank. Pfizer has deposited 21.5L as a sponsorship fee (for conducting workshops). The balance sheet was provided to the house and it was accepted and found in accordance to the statement provided.
- All members of ISMM were requested to update their mail ID on the website for future correspondence and to provide any feedback to the council for improvement. The website services would be continued by the same vendor.
- Dr. A Chakrabarti pointed out that the council has not changed the name of the Indian past president on ISHAM website which needs to be updated immediately.
- For ISMM Mycoses newsletter, members profusely thanked Dr. Savitri Sharma for her tireless efforts to bring out the edition each year, however, a request was made to all the members to submit articles, especially the executive members must make efforts to submit articles from their zones.
- For the last 12 years EQAS is being run successfully and the council invited other centres to join this program. ISMM will now begin the process of accreditation. The fee structure is Rs. 5000/- for 2 batches of EQAS. Currently 250 labs across the country are registered with PGIMER Chandigarh for the same.
- It was suggested that for the Lifetime achievement award a well defined process should be designed by the new council.
- Major expenses were highlighted as 1.5 lakhs and 6.33 lakhs towards ISHAM and ISMM. Dr. A. Chakrabarti suggested to make these events tax free and to spend 80% of the money and get the benefit of tax exemption every year as is being done by FISF
- Five new zonal executive members election was held with Dr. Savitri Sharma as the election officer and the winners were to be announced on 25th March at the valedictory function.

The following were announced as the new council members:

- President: Dr. Jayanthi Savio
- Vice president: Dr. Shukla Das
- General secretary: Dr. Anup K Ghosh
- Treasurer: Dr. Harsimran Kaur
- Joint secretary: Dr. Malini Capoor
- Website Editor: Dr. Pratibha Kale (Co opted member)
- North Zone: Dr. Ragini Tilak (elected)
- West Zone: Dr. Vijayalata Rastogi (Co-opted member)

Central Zone: Dr. Joveeta Joseph

South Zone: Dr. Arghadip Samaddar (elected)

East zone: Dr. Vinay Kumar Hallur (elected)

Ex-officio Member (Immediate Past President): Dr. Anupama Jyoti Kindo

Editor, ISMM Newsletter: Dr. Savitri Sharma

- The venue for the next ISMM conference will be at Sri Ramchandra Medical College Chennai in 2025 as proposed by Dr Anupama Kindo and was accepted by the House with a big applause. Simultaneously a request was obtained from Dr. Manoj Kumar from RIMS Ranchi that he would be interested to hold ISMM 2027 at RIMS, Ranchi. This was accepted by the house with appreciation.
- The meeting ended with profuse thanks and applause to Dr. Anupama J Kindo for completing her tenure as the President and the new council was also warmly welcomed who pledged to work hard with the current President to bring fresh changes and developments during their tenure.

Invasive Aspergillosis in COVID-19 non intubated patient

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Invasive Aspergillosis (IA) is typically known to occur in the setting of severely immunosuppressed hosts. Recently, viruses particularly Influenza virus, Human Cytomegalovirus, Respiratory Syncytial Virus has been identified as associated emerging risk factor. Influenza associated invasive Aspergillosis (IAIA) was rarely diagnosed before 2009 HINI pandemic, but thereafter it has become a well-recognized entity. The impaired host adaptive response is considered as important factor for IAIA and if left untreated, mortality rates remains high. Paralleling with IAIA, COVID associated pulmonary Aspergillosis (CAPA) has been identified as a distinct entity. There is wide variation in the reported incidence of CAPA ranging from 4% to 35% in mechanically ventilated patients. The diagnosis remains challenging due to non-specific and overlapping radiology of CAPA and COVID 19 pneumonia and ARDS and further due to high risk of exposure, difficulty in performing bronchoscopy and computed tomography (CT) scans. We report a case of IA in non-intubated non immunosuppressed COVID 19 patient. The time to detection of IA in COVID 19 patients post admission to the ICU ranged from 0 to 35 days with median of 8 days. All these cases have been reported in mechanically ventilated patients. In our case IA was diagnosed after 14 days of ICU admission in non- intubated patient.

Case Report

A 58-year-old man with comorbidities of hypertension and diabetes mellitus and history of interstitial lung disease with previously treated pulmonary tuberculosis presented with history of fever and shortness of breath for two days. On admission, his blood pressure (BP) was -130/80 mm of mercury, pulse rate (PR)- 78 beats per minute, respiratory rate (RR) - 24 per minute, and oxygen saturation of 94 % on 6 litres of oxygen per litre, temperature 101o C. Initial chest X ray (CXR) showed bilateral peripheral opacities (Fig. 1). SARS-CoV-2 RNA was detected in nasopharyngeal and throat swab by reverse

transcriptase polymerase chain reaction (RT-PCR) method. He was started on injection Remdesivir for 5 days, tablet doxycycline 100 mg twice daily and other supportive treatment (methylprednisolone and low molecular weight heparin). Within next 3-4 days his condition deteriorated with increasing oxygen requirements of 16 litre/minute via NRBM, with further worsening he was put on high flow nasal cannula (HFNC) with fraction inspired oxygen (Fig. 2) of 40% at 40 litre/minute.

On 6th day his TLC increased to 17000 /mm³ which further escalated to 22000/mm³, with increasing count he was initiated on broad spectrum antibiotics, his blood culture and urine cultures were sterile. Gradually around 10th day, his oxygen requirement was reduced to 20 litre/minute and CXR shows improvement, fever subsided with TLC showing declining trend. However, on day 14 of admission, his oxygen requirement again increased with 40 litres/min via HFNC. TLC again rose to 26000/mm³, his COVID RT PCR was still positive on day 15. Even after 10 days of antibiotics after initial improvement, his counts were persistently high and with high oxygen requirements about 60 litre/minute via HFNC. The urine culture and blood cultures were sterile. In view of persistently high white blood cell counts and high oxygen requirements, progressively increasing infiltrates on CXR (Fig. 3), invasive fungal disease (IFD) was thought of. Patient was not able to expectorate sputum, his serum Galactomannan (GM) was sent. CT scan and bronchoscopic studies were not done to avoid risk of exposure. The serum GM was reported to be 0.97 (cut off 0.5) and diagnosis of IA was made. The patient was started on oral voriconazole (6 mg/kg loading followed by 4 mg/kg twice daily) on day 18 of admission. There was rapid clinical and radiological improvement over the next 7 days (Fig. 4). TLC settled, oxygen requirements gradually reduced to 30 litre/min via HFNC with resolution of infiltrates on chest radiology, ABG pH - 7.4, Po₂ - 115, PaCo₂ - 45, Hco₃ - 29.4. After one month his RT PCR came negative and he was shifted to non COVID ICU on 15 litre oxygen per litre.

Discussion

The diagnosis of IA is based upon European Organization for Research and Treatment of Cancer/Invasive Fungal Infections Cooperative Group and the National Institute of Allergy and Infectious Diseases Mycoses Study Group (EORTC/MSG) which has been validated in immunocompromised patients. Given high risk of exposure, bronchoscopic studies and CT scans are not always feasible in COVID 19 infections. Various reports have utilized different diagnostic criteria for diagnosis of CAPA but no validated algorithm has been proposed. For decades now, fungal biomarkers; Galactomannan (GM), Beta- D glucan (BDG) has been used for IFD especially in transplant or oncology settings. It is believed that these biomarkers are detectable even before clinical symptoms start and hence are used for pre-emptive treatment. GM is the carbohydrate constituent of the cell wall of Aspergillus sp., released by the fungus during cell growth. The GM cut off in serum is 0.5, the sensitivity is poor in non immunocompromised patients due to robust immune response, poor fungal burden, less dissemination and release. In our patient, we used the recently proposed definitions of IAIA which includes non-specific radiology and single positive serum GM for making diagnosis and the patient responded well to antifungal therapy. We believe that high suspicion is required in COVID 19 patients even in absence of mechanical ventilation and preemptive therapy should be initiated as early as possible. There are still unanswered questions like timing of presentation, screening protocol, diagnostic criteria and treatment guidelines which can be addressed by large studies.

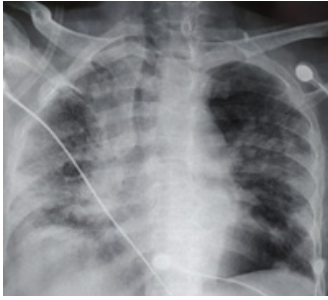


Figure 1: Chest radiograph on the day of admission, showing poorly defined pulmonary opacities bilaterally, located principally in the middle and lower lung fields.



Figure 2: Chest radiograph day 10 of admission showing initial improvement of bilateral opacities.



Figure 3: Chest radiograph on day 14 showing increased confluent right lung opacities and persistent focal opacities in left lung.



Figure 4: Post voriconazole treatment day 7 showing overall improvement.

Answer for the last issue's identify the fungus (ISMM mycoses, Issue 24, Quiz December 2022)

A 38-year-old male presented with the complaints of painless, swelling over the wrist of right hand, gradually increasing in size for 6 months. The patient had a history of diabetes mellitus and underwent renal transplant 3 years back and was on immunosuppressants. He did not recall any history of trauma. The local examination revealed a non-tender, 4 × 4 cm cystic swelling over the dorsum of the wrist. Fine needle aspiration from the lesion was performed and the aspirate was subjected to microbiological evaluation which included 10% potassium hydroxide (KOH) smear and culture on Sabouraud dextrose agar (SDA) at 25°C and 37°C. The KOH mount showed dark septate hyphae and the culture grew cream coloured velvety colonies which turned greyish brown in colour after further incubation (Fig A). The lactophenol cotton blue (LCB) mount from culture is shown in figure B. Please identify the fungus to species level.

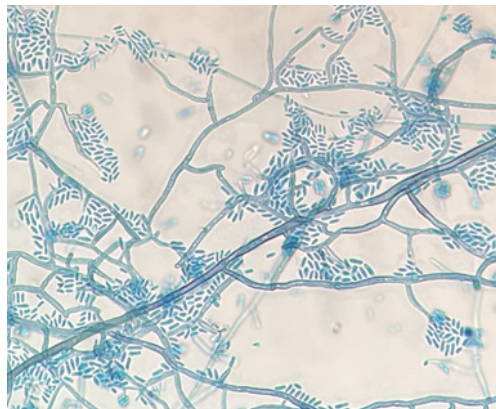
Correct identification: *Phaeoacremonium parasiticum* (Correctly answered by Dr. Ningthoujam Priyolakshmi Devi, RIMS, Imphal)

Last quiz colony on SDA (Fig. A) and lactophenol cotton blue mount (Fig. B) picture

Fig. A

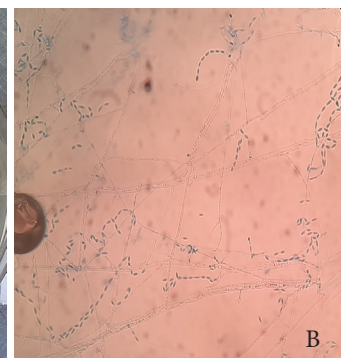
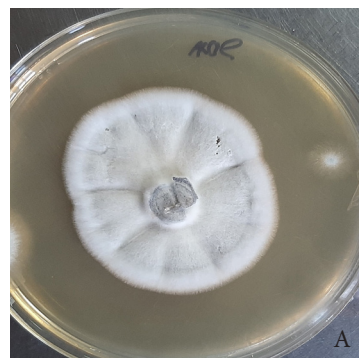


Fig. B



Quiz: Can you identify the fungus?

A 60-year-old male with history of renal transplant one year back presented with memory disturbances, occasional headache for 1 month and right sided hemiparesis for 8 hours. He had no history of recent travel. A non-contrast computerized tomography (NCCT) scan of the head revealed a left thalamic hypodensity (1 × 2 cm). Brain T2 magnetic resonance imaging (MRI) showed ring-enhancing lesion suggestive of abscess. Lumbar puncture was performed, and cerebrospinal fluid (CSF) depicted elevated glucose (136 mg/dL) and protein (160 mg/dL) while microscopy and culture did not show any significant finding. Stereotactic biopsy of the thalamic brain lesion third day revealed frank pus which showed septate hyphae in potassium hydroxide (KOH) mount and grew downy, white colonies on Sabouraud dextrose agar (SDA) within 48 hours of incubation (Fig A). The lactophenol cotton blue mount from culture is shown in figure B. Please identify the fungus to species level.



Send your answer to Dr. Harsimran Kaur at drharsimranpgi@gmail.com

Note: The member submitting the correct answer will be eligible for a prize from ISMM on “first come first served” basis. Eligibility criteria includes age limit of 40 years and membership of ISMM. The responder is required to submit a soft copy of age proof along with the answer.

Results of ISMM Mycology External Quality Assurance Program conducted at PGIMER, Chandigarh

Performance Report of the Participants (28th Batch, Jan 2023)

Total number of participating laboratories -136

S No.	Sample/ Code	Clinical details			Correct identification	Interpretation	Laboratory(%) given correct results
		Age/Sex	Clinical feature/ Diagnosis	Source of specimen			
1	EQMM-1	65 yrs/F	Keratitis	Corneal scraping	<i>Sarocladium kiliense</i>	Fungal keratitis	82%
2	EQMM-2	52 yrs/M	Nodular lesion on foot	Skin biopsy	<i>Phialophora verrucosa</i>	Subcutaneous fungal infection. (Phaeohyphomycosis)	68%
3	EQMM-3	45 yrs/M	Non healing ulcer on forearm	Biopsy from edge of ulcer	<i>Sporothrix globosa</i>	Sporotrichosis	53.8%
4	EQMM-4	14 yrs/M	Facial trauma followed by nasolabial swelling	Nasal biopsy	<i>Conidiobolus coronatus</i>	Entomophthoromycosis	76.2%
5	EQMM-5*	50 yrs/M	Sepsis	Blood culture	<i>Trichosporon asahii</i>	Fungaemia	80%

Results of antifungal susceptibility testing (AFST) performed for EQMM-5; Laboratories participating in AFST -49.26 %

(EQMM-5) Minimum inhibitory concentration	Amphotericin B 0.5mg/L	Fluconazole 2.0mg/L	Voriconazole 0.06mg/L	Itracozazole 0.5mg/L	Posaconazole 0.25mg/L	Caspofungin 0.125mg/L	Anidulafungin 0.25mg/L	Miconazole 0.3mg/L
Participants results %	48.52%	50%	45.58%	27.94%	26.47%	38.97%	23.52%	30.88%

Abstracts (January – June 2023)

Compiled by Dr. Joveeta Joseph

Microbiologist, Jhaveri Microbiology Centre, L V Prasad Eye Institute, Hyderabad

1. Post-COVID-19 Fungal Infection in the Aged Population

Vivek P Chavda¹, Toshika Mishra², Sathvika Kamaraj², Swati Punetha², Oishani Sengupta², Yash Joshi², Suneetha Vuppu², Dixa Vaghela³, Lalitkumar Vora⁴

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Vaccines (Basel). 2023 Feb 27;11(3):555. doi: 10.3390/vaccines11030555. PMID: 36008879

Abstract

Coronavirus disease 2019 (COVID-19) infection is currently a great cause of concern for the healthcare sector around the globe. SARS-CoV-2 is an RNA virus that causes a serious infection that is associated with numerous adverse effects and multiple complications associated with different organs and systems during its pathogenic cycle in humans. Individuals affected by COVID-19, especially elderly populations and immunocompromised people, are greatly vulnerable to opportunistic fungal pathogens. Aspergillosis, invasive

candidiasis, and mucormycosis are widespread fungal coinfections in COVID-19 patients. Other fungal infections that are rare but are exhibiting increased incidence in the current scenario include infections caused by *Pneumocystis jirovecii*, *Histoplasma* sp., *Cryptococcus* sp., etc. By producing virulent spores, these pathogens increase the severity of the disease and increase the morbidity and fatality rates in COVID-19 patients globally. These infections generally occur in patients recovering from COVID-19 infection, resulting in rehospitalization. Older and immunocompromised individuals are at higher risk of developing opportunistic fungal infections. This review focuses on understanding the opportunistic fungal infections prevalent in COVID-19 patients, especially elderly people. We have also highlighted the important preventive methods, diagnostic approaches, and prophylactic measures for fungal infections.

2. COVID-19-Associated Rhino-orbital mucormycosis: Presentation and outcome

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¹Department of Ophthalmology, Motilal Nehru Medical College, Medical College Campus, Prayagraj, Uttar Pradesh, India.

Saudi J Ophthalmol. 2022 Aug 10;37(1):72-75. doi: 10.4103/sjopt.sjopt_154_21. eCollection 2023 Jan-Mar, PMID: 36968777

Abstract

We are reporting four accounts of rhino-orbital mucormycosis in patients during and after recovery from SARS-CoV-2 infection. The patients were diagnosed and treated for COVID-19 according

to the current treatment protocols, following which they presented with sudden proptosis, ophthalmoplegia, and conjunctival injection, confirmed by magnetic resonance imaging and histopathological examination. The patients were treated with intravenous liposomal amphotericin B, and the outcome was observed. Early diagnosis and prompt intervention can substantially reduce the morbidity and mortality rates in these patients.

3. Disseminated Cryptococcosis in Idiopathic CD4+ Lymphocytopenia

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Infect Disord Drug Targets. 2023;23(1): e210622206242. doi: 10.2174/1871526522666220621110723, PMID: 35726810

Abstract

Introduction: Idiopathic CD4+ Lymphocytopenia (ICL) is a rare entity grouped in non- HIV-related syndromes. ICL is characterized by a marked low CD4 T cell count of <300 cells/mm³ with ambiguous natural history and prognosis. In addition, cryptococcal and nontuberculous mycobacterial infections are reported as known opportunistic infections. Therefore, management turns around vigilant follow-up and treatment of the current clinical scenario of these patients. **Case presentation:** Here, a 55-year-old lady was referred with a history of diffuse headache and intermittent fever for two months, projectile vomiting, and altered mental status for five days. Nonpruritic maculopapular rashes and diffuse desquamation of the skin were noted. She had no significant previous medical history. Based on clinical findings and investigations, she was diagnosed with ICL having disseminated cryptococcosis. Unfortunately, the patient did not undergo specific treatment as she was recognized late, and unfortunately, she died. **Conclusion:** It is of paramount importance to recognize the clinical entity as early as possible to start appropriate treatment, which may positively impact the outcome. Therefore, the clinician must be aware of disseminated cryptococcosis associated with non-HIV states.

4. Molecular Detection and Identification of Fungal Pathogens Infections Occurring in COVID-19 Recovered Patients

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¹Sankara Nethralaya Referral Laboratory, Medical Research Foundation, Nungambakkam, Chennai, 600 006 India, ²L&T Microbiology Research Centre, Medical Research Foundation, Chennai, 600 006 India.

Virusdisease. 2023 Mar;34(1):88-91. doi: 10.1007/s13337-022-00805-8. Epub 2023 Feb 4. PMID: 36776382

Abstract

The major outbreak of Corona virus disease COVID-19 caused by SARS-CoV-2 had brought about 4.55 million deaths and had shaken the health care system all over the world. From the year 2020 the recovered COVID-19 patients had started to develop microbial infection, most predominantly fungal infection in which Mucormycosis gained immediate attention as it has worsened the mortality rate in humans. In the present study of 53 COVID-19 recovered patients presented with microbial infection, the analysis of frequency distribution of fungal infection preponderantly with *Rhizopus oryzae*, followed by *Aspergillus* and *Candida* species.

5. Cryptic Presentation of Cryptococcal Osteomyelitis in an Apparently Immunocompetent Individual

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Ramanathan¹

¹Department of Internal Medicine, Apollo Hospitals, Chennai, Tamil Nadu, 600003, India.

Eur J Case Rep Intern Med. 2023 Feb 28;10(3):003737. doi: 10.12890/2023_003737. eCollection 2023. PMID: 36969527

Abstract

Cryptococcosis is an opportunistic fungal infection seen in immunocompromised individuals. It is caused by the yeast-like fungus *Cryptococcus* and predominantly affects the lungs and central nervous system. Immunocompetent individuals very rarely develop bone involvement and only a few cases of cryptococcal osteomyelitis in patients without other comorbid conditions have been described. Only one other case of pelvic involvement, which was accompanied by lymphopaenia, has been reported. We describe the case of a 42-year-old immunocompetent man with cryptococcal hip osteomyelitis.

Learning points: Osteomyelitis due to *Cryptococcus* is very rare. Cryptococcal osteomyelitis is uncommon in immunocompetent individuals. Prompt intravenous treatment with antifungal medication should be offered to all patients with cryptococcal osteomyelitis.

6. Cryptococcal lymphadenitis-First presentation in an HIV-positive patient

Sana Ahuja¹, Mukul Singh¹

¹Department of Pathology, Vardhman Mahavir Medical College and Safdarjung Hospital, New Delhi, India.

Cytopathology. 2023 May;34(3):279-280. doi: 10.1111/cyt.13206. Epub 2023 Jan 16. PMID: 36588158

Abstract

Cryptococcal infection is a life-threatening, opportunistic infection in human immunodeficiency virus-infected individuals. The infection most commonly begins in the respiratory tract, with secondary involvement of the brain, skin, and lymph nodes. We report a rare case of isolated cervical cryptococcal lymphadenitis diagnosed on fine needle aspiration cytology, which was the initial presentation of secondary immunodeficiency in the patient. Periodic acid-Schiff stain, India ink preparation, and culture were done to confirm the diagnosis. He was diagnosed as HIV-positive on further investigation.

7. *Candida auris* biofilm: a review on model to mechanism conservation

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Expert Rev Anti Infect Ther. 2023 Mar;21(3):295-308. doi: 10.1080/14787210.2023.2179036. Epub 2023 Feb 16. PMID: 36755419

Abstract

Introduction: *Candida auris* is included in the fungal infection category 'critical' by WHO because of associated high drug tolerance and spread at an alarming rate which if remains untouched may result in serious outbreaks. Since its discovery in 2009, several assiduous efforts by mycologists across the world have deciphered its biology including growth physiology, drug tolerance, biofilm formation, etc. The differential response of various strains from different clades poses a hurdle in drawing a final conclusion.

Areas covered: This review provides brief insights into the understanding of *C. auris* biofilm. It includes information on various models developed to understand the biofilms and conservation of different signaling pathways. Significant development has been

made in the recent past with the generation of relevant in vivo and ex vivo models. The role of signaling pathways in the development of biofilm is largely unknown.

Expert opinion: The selection of an appropriate model system is a must for the accuracy and reproducibility of results. The conservation of major signaling pathways in *C. auris* with respect to *C. albicans* and *S. cerevisiae* highlights that initial inputs acquired from orthologs will be valuable in getting insights into the mechanism of biofilm formation and associated pathogenesis.

8. Spectrum of Fungal Infections in a Tertiary Care Centre of North India: Pre-COVID and COVID Scenario and Implications

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Cureus. 2023 May 5;15(5):e38616. doi: 10.7759/cureus.38616. eCollection 2023 May. PMID: 37284389

Abstract

Background Rhino orbital mucormycosis is a rare and very aggressive entity. A sudden rise of this entity has been noticed with the insurgence of the COVID-19 pandemic both among immunocompromised and immuno-competent patients. This study was done to determine any possible correlation between these two deadly diseases. Materials and Methods This was a retrospective observational study done in the pathology department of a tertiary care center in North India over a three-year period (January 2019 - December 2021). Patient details along with relevant clinical data were retrieved from the patient's record file. Hematoxylin and eosin-stained slides of diagnosed cases were taken from the department records. Results A total of 45 patients (34 males, 11 females) were included in the study, seven of which were ophthalmic exenteration specimens. The mean age of the patients was 52.68 years. Fifteen cases showed COVID-19 reverse transcription-polymerase chain reaction (RT-PCR) positivity. Histopathology revealed the presence of mucormycosis in all the cases. There were six cases showing granuloma formation and 14 cases revealed mixed fungal infection. Optic nerve involvement was seen in six cases of exenteration specimens. Conclusions The present study showed a sudden resurgence of secondary fungal infections, especially during the second wave of the COVID-19 pandemic. Associated co-morbid conditions and injudicious use of steroids and antibiotics have been the cause of depressed immunity leading to the infections. One must be aware of such co-infections to facilitate timely medical management to reduce morbidity and mortality.

9. Nontubercular Bacterial and Fungal Infections in Patients of Chronic Obstructive Pulmonary Disease

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Ann Afr Med. 2023 Jan-Mar;22(1):77-81. doi: 10.4103/aam.aam_186_21. PMID: 36695226

Abstract

Introduction: Acute exacerbation of chronic obstructive pulmonary disease (COPD), frequently due to respiratory tract infection is the major cause of morbidity and mortality, and estimate suggests that it is currently the third leading cause of death worldwide. **Aims and objectives:** This study aims to study the prevalence of nontubercular

bacterial and fungal infections in patients of COPD. **Materials and methods:** It is an observational study done for 1-year period from August 2017 to July 2018. A total of 100 COPD patients who fulfilled the inclusion and exclusion criteria were analyzed in the present study. These cases were classified according to the Global Initiative for Chronic Obstructive Lung Disease (GOLD) combined assessment criteria and subjected to sputum or in some cases Bronchoalveolar lavage (BAL) fluid examination for nontubercular bacterial and fungal pathogens. Serum galactomannan assay, bronchoscopy, and computed tomography chest were done in selected cases. **Results:** The age of the study population ranged from 40 to 85 years and the mean age was 60.01 ± 9.85 years. Majority of the patients were male (81.0%) and most (78.0%) of them were smokers. Most of the patients belonged to GOLD Grades 2 and 3. Forty-six percent of the patients did show pathogenic organisms in sputum examination. Out of these, 80.4% were bacterial, mainly Gram-negative organisms (*Acinetobacter*, *Pseudomonas*, *Escherichia coli*, *Enterobacter*, *Proteus*, and *Citrobacter*) and 19.6% of cases were having fungal infections (*Candida* and *Aspergillus*). **Conclusions:** Increasing patient age, smoking habit, and severity of COPD were related to an increasing frequency of bacterial and fungal infections. Early detection and proper treatment could help in preventing the morbidity and mortality related to COPD.

10. Anticryptococcal Activity and Mechanistic Studies of Short Amphipathic Peptides

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Arch Pharm (Weinheim). 2023 Apr;356(4):e2200576. doi: 10.1002/ardp.202200576. Epub 2023 Jan 2. PMID: 36592413

Abstract

Cryptococcus neoformans, an opportunistic fungal pathogen, causes cryptococcosis in immunocompromised persons. A series of modified L-histidines-containing peptides are synthesized that exhibit promising activity against *C. neoformans*. Analog 11d [L-His(2-adamantyl)-L-Trp-L-His(2-phenyl)-OMe] produced potency with an IC₅₀ of 3.02 µg/ml (MIC = 5.49 µg/ml). This peptide is noncytotoxic and nonhaemolytic at the MIC and displays synergistic effects with amphotericin B at subinhibitory concentration. Mechanistic investigation of 11d using microscopic tools indicates cell wall and membrane disruption of *C. neoformans*, while flow cytometric analysis confirms cell death by apoptosis. This study indicates that 11d exhibits antifungal potential and acts via the rapid onset of action.

11. Analytical Study on Current Trends in the Clinico-Mycological Profile among Patients with Superficial Mycoses

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J Clin Med. 2023 Apr 22;12(9):3051. doi: 10.3390/jcm12093051.

PMID: 37176492

Abstract

Infections affecting the superficial keratinized layer of the skin, nails, and hair are referred to as dermatophytosis and dermatomycoses, which constitute the most common type of fungal infection that affects people. This clinical ailment has a prevalence of between 30 and 60% and is more common in India's hot, muggy, tropical climate. Examining the prevalence of superficial mycoses (SM), their clinical symptoms, and the fungal species that were identified as the disease-causing agents were the main objectives of the current study. This study comprised 250 clinically confirmed patients with SM who visited our dermatology department over the course of a year. Skin scrapings, nail clippings, and hair samples were gathered, mounted, and cultured using KOH. Macroscopic examination of culture, tease mount, and phenotypic tests were used to identify the species. The age group of 11-20 years (29%) had the highest prevalence of SM out of the 250 clinically verified cases of the condition that were included in our study, followed by 21-30 years (20%) and 31-40 years (18%). *Candida albicans*, dermatophytes, and non-dermatophytic moulds were the three most prevalent fungal isolates. The most typical dermatophyte isolate was *T. rubrum*, which was primarily found in *Tinea corporis* (TCo), *Tinea cruris* (TCr), and *Tinea faciei* (TFa). *T. mentagrophytes* was the second most frequent isolate. According to our investigation, it was determined that non-dermatophytic moulds constitute a significant contributor to the development of SM in addition to dermatophytes.

12. Lipid-based amphotericin B gel treatment eradicates vulvovaginal candidiasis in patients who failed to azole therapy

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Arch Dermatol Res. 2023 Mar 1. doi: 10.1007/s00403-023-02583-9. Online ahead of print. **PMID:** 36856855

Abstract

Vaginal yeast infection is one of the most common diseases caused by vulvovaginal candidiasis (VVC). Effective therapy for VVC is needed. A lipid-based amphotericin B gel 0.1% (LAB) was developed and evaluated for the treatment of VVC patients and those who failed to azole therapy. LAB was applied topically twice daily for 7 days to 64 moderate patients and 14 days to 55 severely infected VVC patients. Additionally, 66 patients who failed to azole therapy were treated twice daily with LAB for 14 days. A 91.5% clinical response and 93.16% mycological response was observed in VVC patients. The patients treated with LAB who failed to azole therapy showed a

75% clinical, 95.3% mycological response and 83% remission was observed. Overall, the LAB was found to be efficacious and safe for the treatment of VVC patients. Clinical Trial Registration All the trials were registered at Clinical Trial Registry of India (CTRI/2013/02/003378, CTRI/2014/02/004409).

13. Subcutaneous zygomycosis in an immunocompetent patient caused by *Basidiobolus ranarum*

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BMJ Case Rep. 2023 Jan 5;16(1):e253515. doi: 10.1136/bcr-2022-253515. **PMID:** 36604110

Abstract

Zygomycosis is a fungal infection in humans caused by orders Mucorales and Entomophthorales. The incidence of Mucorales causing mucormycosis is on a rise and is well documented, whereas Entomophthorales is rare. Among Entomophthorales, infections caused by *Conidiobolus* are more common than *Basidiobolus*. Here we present a case of subcutaneous basidiobolomycosis in a female patient. The patient had hyperpigmentation in the thigh region for 6 months and serous discharge for 4 months. All initial findings suggested the inflammatory stage of morphea. Differential diagnoses of granuloma annulare, malignant melanoma and morphea were considered radiologically. A good suspicion of fungal aetiology by the dermatologist led to an appropriate diagnosis of subcutaneous basidiobolomycosis based on fungal culture and histopathological examination. Based on macroscopic and microscopic findings, the causative organism was confirmed to be *Basidiobolus ranarum*. The patient was started on oral potassium iodide and itraconazole and showed a good prognosis.

14. Ovarian aspergilloma in an immunocompetent patient masquerading as ovarian neoplasm

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¹King George's Medical University, Lucknow, India.

Arch Clin Cases. 2023 Mar 27;10(1):39-41. doi: 10.22551/2023.38.1001.10237. eCollection 2023. **PMID:** 37056953

Abstract

Aspergillus is a ubiquitous fungus that can cause a variety of clinical syndromes. It can lead to a spectrum of clinical presentations depending upon the severity of the disease, degree of immune compromise, nature and intensity of inflammatory host response. Ovarian aspergilloma is extremely unusual, only a few case reports have been described in the literature. Here, we report a case of ovarian aspergilloma which was masquerading as ovarian neoplasm on clinical examination and radiology. To the best of our knowledge, this is the first case report of isolated ovarian aspergilloma in an immunocompetent patient.

15. Newfangled Topical Film-Forming Solution for Facilitated Antifungal Therapy: Design, Development, Characterization, and In Vitro Evaluation

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Polymers (Basel). 2023 Feb 17;15(4):1003. doi: 10.3390/polym15041003. PMID: 36850286

Abstract

Luliconazole is a broad-spectrum topical antifungal agent that acts by altering the synthesis of fungi cell membranes. Literature suggests that the recurrence of fungal infection can be avoided by altering the pH of the site of infection. Studies have also suggested that fungi thrive by altering skin pH to be slightly acidic, i.e., pH 3-5. The current study is aimed to design, develop, characterize, and evaluate an alkaline pH-based antifungal spray solution for antifungal effects. Luliconazole was used as an antifungal agent and an alkaline spray was formulated for topical application by using Eudragit RS 100, propylene glycol (PG), water, sodium bicarbonate, and ethanol via solubilization method. Herein, sodium bicarbonate was used as an alkalinizing agent. Based on DSC, FTIR, PXRD, scanning electron microscopy (SEM), and rheological analysis outcomes, the drug (luliconazole) and polymer were found to be compatible. F-14 formulation containing 22% Eudragit RS 100 (ERS), 1.5% PG, and 0.25% sodium bicarbonate was optimized by adopting the quality by design approach by using design of experiment software. The viscosity, pH, drying time, volume of solution post spraying, and spray angle were, 14.99 ± 0.21 cp, 8 pH, 60 s, $0.25 \text{ mL} \pm 0.05 \text{ mL}$, and 80 ± 2 , respectively. In vitro drug diffusion studies and in vitro antifungal trials against *Candida albicans* revealed $98.0 \pm 0.2\%$ drug diffusion with a zone of inhibition of 9 ± 0.12 mm. The findings of the optimized luliconazole topical film-forming solution were satisfactory, it was compatible with human skin, and depicted sustained drug release that suggests promising applicability in facilitated topical antifungal treatments.

16. Comparative Proteome Analysis Identifies Species-Specific Signature Proteins in *Aspergillus* Pathogens

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Appl Microbiol Biotechnol. 2023 Jun;107(12):4025-4040. doi: 10.1007/s00253-023-12559-4. Epub 2023 May 11. PMID: 37166481

Abstract

Aspergillus flavus and *Aspergillus fumigatus* are important human pathogens that can infect the lung and cornea. During

infection, *Aspergillus* dormant conidia are the primary morphotype that comes in contact with the host. As the conidial surface-associated proteins (CSPs) and the extracellular proteins during the early stages of growth play a crucial role in establishing infection, we profiled and compared these proteins between a clinical strain of *A. flavus* and a clinical strain of *A. fumigatus*. We identified nearly 100 CSPs in both *Aspergillus*, and these non-covalently associated surface proteins were able to stimulate the neutrophils to secrete interleukin IL-8. Mass spectrometry analysis identified more than 200 proteins in the extracellular space during the early stages of conidial growth and germination (early exoproteome). The conidial surface proteins and the early exoproteome of *A. fumigatus* were enriched with immunoreactive proteins and those with pathogenicity-related functions while that of the *A. flavus* were primarily enzymes involved in cell wall reorganization and binding. Comparative proteome analysis of the CSPs and the early exoproteome between *A. flavus* and *A. fumigatus* enabled the identification of a common core proteome and potential species-specific signature proteins. Transcript analysis of selected proteins indicate that the transcript-protein level correlation does not exist for all proteins and might depend on factors such as membrane-anchor signals and protein half-life. The probable signature proteins of *A. flavus* and *A. fumigatus* identified in this study can serve as potential candidates for developing species-specific diagnostic tests.

Announcements

ISMM in collaboration with CIDS will be holding a CME on “Fungal Infection” on 27th August 2023 from 9 AM to 5 PM .

The CME is a joint venture of Mycologists and Infectious disease clinicians to present a holistic approach to fungal infection management : diagnostic and clinical skills

CIDS Haryana, Noida and Chandigarh chapter

The Clinical Infectious Diseases Society (CIDS) is an organization of and for physicians, health professionals and scientists that advances the specialty of Infectious Diseases in India through education, research, advocacy and professional support. Their mission is to improve the standard of clinical care of Infectious Diseases in India by educating health care professionals, sharing new knowledge, advancing research, and advocating the highest quality care for patients. CIDS has regional chapters to achieve their mission and creating awareness about Infectious disease, its clinical management at local or regional level for improving patient care.

CIDS Haryana, Noida and Chandigarh chapter is a group of young dynamic Infectious disease physicians who approached us for conducting a scientific session on fungal infections. This amalgamation of diagnostics and clinicals will surely provide best insight into in depth knowledge of fungal infections.

CME on
“Fungal Infections”
 under the aegis of
 ISMM (Indian Society of Medical Mycologist)
 in collaboration with
 CIDS (Clinical Infectious disease society) .
 Haryana, Noida and Chandigarh
 Tricity Chapter

Topics Covered

- Fungal Genomics
- Newer diagnostics
- Fungal Biomarkers
- Antifungals
- Therapeutic Drug Monitoring
- Clinical Case-based approach
- Panel discussion & many more

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BLOCK YOUR DATE
 27 AUGUST
 2023

Dr. Malini R Capoor, Professor, Dept. of Microbiology, VMMC & Safdarjung Hospital, Delhi, India, organised a preconference workshop under aegis of Uttarpradesh-Uttarakhand MICROCON Annual Conference on Invasive Fungal Infections: Lab diagnosis, antifungal susceptibility testing, and molecular methods in the Department of Microbiology, AMU, Aligarh on 2nd Feb 2023.

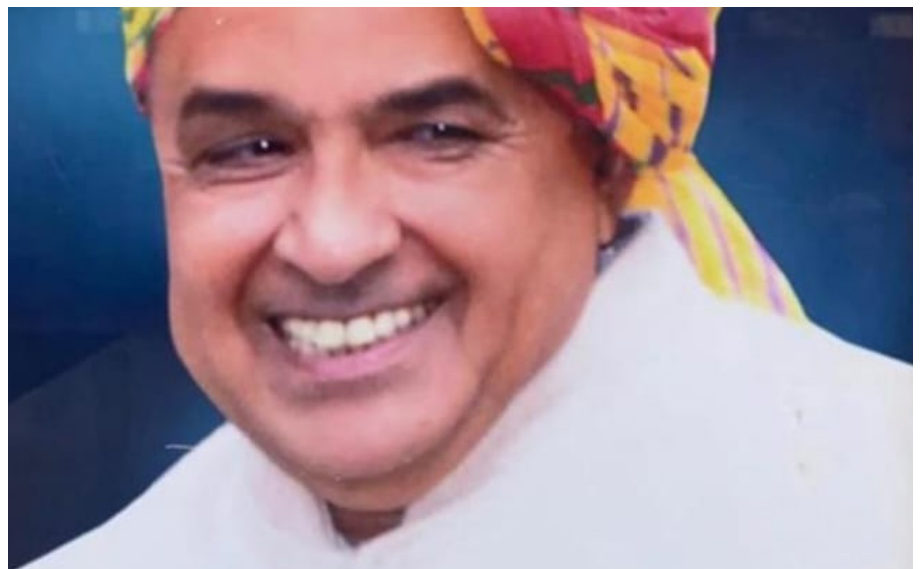


Obituary

Born on 5th April, 1952, Dr Prem Singh Nirwan, former HOD, Department of Microbiology and P&C Jawaharlal Nehru Medical College and associated group of hospitals, Ajmer; Principal & Controller, Government Medical College, Kota, left us for the heavenly abode. A fountainhead of knowledge, passionate mycologist and always a source of inspiration, he has left behind a rich harvest of memories to cherish, honour and emulate. The values he set in Mycology will always remain with us and the future generations will further develop on the template he left. In reverence and remembrance...

Members of ISMM

Dr. Vijaylatha Rastogi, Senior Professor & Head, Dept. of Microbiology, J.L.N Medical College, Ajmer



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