Issue 28-December 2024

ISMM MYCOSES Newsletter

Message of the President

Dear ISMM fraternity,

2024 has gone by with pleasant memories to cherish and 2025 is here with a promise for many new ones.

Wishing each one of you and your dear ones a wonderful beginning to the New Year……. have a happy, healthy, peaceful, prosperous and successful year ahead.

We begin on a very positive note - The countdown for the Chennai ISMM biennial conference has begun. The hosts Dr. Anupma and her team are all set. Knowing them as well as I do, it will be executed to perfection. The academic program has been meticulously planned and the resource faculty both national and international have been carefully chosen to cover all aspects of mycoses. I am sure everyone including professionals from clinical / non-clinical, medical / non-medical, and students / research scholars will benefit. I sincerely request and urge postgraduates of microbiology and infectious diseases and young faculty to participate in large numbers and showcase their research work with oral and poster presentations. There are many prestigious awards to be won too. Chennai is also a great tourists' destination with exquisite south Indian cuisine. Looking forward to great attendance.

The ISMM executive council strives hard in its mission to make mycoses manageable in our country. I request the young mycologists wanting to contribute and work in the council to send in their zonal representative nominations.

The members are the strength of any organization and ISMM has strengthened over the couple of years. Your valuable feedback and suggestions to the team are welcome. We will definitely work towards taking them forward. Do encourage your colleagues and students to become members.

My sincere gratitude to Dr. Savitri Sharma – publishing the newsletter is madam's singular effort. I thank my entire team for setting targets and working through the entire term to achieve them.

Hope to meet everyone in Chennai.

Jayanthi Savio
President, Indian Society of Medical Mycologists

Report of General Secretary

4th Secretary report

Greetings ISMM members,

As the year comes to an end, I hope everyone has had an amazing 2024. Being the part of my duty as a General Secretary of the Indian Society of Medical Mycologists (ISMM), I am glad to provide some recent updates and activities of our organization.

Since the last report, we have conducted three Executive Council (EC) Meetings (7th 8th & 9th). I am summarizing the meeting reports below:

The 7th EC meeting was held on 24th August 2024. The following topics were discussed:

Dr. Anupama Jyoti Kindo wanted to confirm whether the recipient of student travel grant should be a member of ISMM or not. The EC members confirmed that the membership is required to apply for the travel grant award. She also informed that the conference website is functional, and anyone can register using the website.

Dr. Shukla informed about the logistical problems she was facing regarding her upcoming CME to be held at Delhi on 15th September,2024 on AMR in fungal infections.

Dr. Vinay discussed the possibilities of online teaching module starting under ISMM banner. He explained that the questionnaires have already been prepared and circulated, and he will finalize it with his team, including Dr. Harsimran, Dr. Pratibha and Dr. Arghadeep.

Dr. Harsimran discussed the need for the upcoming fungal disease awareness week (FDAW) in mid-September. It has been decided that the ISMM will organize an online lecture series from 16-20th September at 3-4 PM.The members agreed for the CME to be conducted for 5 days, with 4 topics each. The video platform for conducting the online CME will be arranged by Dr. Pratibha.

The members unanimously agreed upon Dr. Vinay's suggestion to start the drive for discounted membership during the online CME, and for it to be extended until 31st December 2024.

It was also discussed and decided that for any future financial issues related to the ISMM bank account, advice/suggestions should be taken from Prof. Shivaprakash Rudramurthy.

The 8th EC meeting was held on 21st Oct 2024. The following agenda was discussed:

The meeting started with a thank you note for those who successfully conducted the fungal disease awareness week (FDAW) under the ISMM banner from 16-20th September, where 4 brief online lectures took place every day from 3-4 PM. On an average, 200 participants actively joined online lectures daily.

Dr. Anupama Jyoti Kindo wanted to finalize the certificate format of all award categories and the possible signatories on the certificates. The EC decided that the certificate format could be decided by Dr. Kindo and her team. The three signatories on all certificates would be the President of ISMM, the Organizing Secretary, and the Organizing President. Responding to her another query of lifetime achievement award, the EC informed her that the name of the awardee has been finalized and will be announced in the ISMM meeting 2025. Regarding the registration fees waiver of senior citizen or retiree members, EC advised that the matter is entirely on the organizing committee and the same could be

discussed in the ISMM GB 2025 meeting to pursue further.

In response to Anup Ghosh's query regarding the accumulation of multiple FDs in Indian banks to one FD, all EC members agreed that any two of the ISMM Presidents, the General Secretary and the Treasurer can take any financial related decision, especially the FD issue.

With respect to CME under the ISMM banner, the members unanimously decided that any such meeting would have to be signed off by the President or Secretary of the ISMM in the certificates. There will be no financial liability on ISMM. If the ISMM account is used, 10% of total surplus funds must be donated to the ISMM account after the meeting. Dr. Arghadeep proposed one online webinar under ISMM on beta D-glucan assays on 16th November which was agreed upon. Dr. Vinay informed all that the proposal of online lectures on the ISMM platform has been approved by the Ethics Committee, and he will let us know next steps soon. When discussing the timing of online lectures on the ISMM platform, the EC members suggested a new ISMM lecture series could be started from second week of January 2025.

The 9th EC meeting was held on 29th November 2024. The following agenda was discussed:

The primary agenda of the meeting was to discuss an idea suggested by Dr. Vinay about issuing a declaration for fungal drug resistance like the Chennai Declaration for AMR. This declaration would aim to highlight the deficiencies in current methods available for diagnosing fungal infections, as well as the growing incidence of drug-resistant fungal infections. Dr. Vinay emphasized the urgency and importance of addressing the growing issue of drug-resistant fungal infections. The committee discussed the proposal in-depth and recognized the need for a formal declaration.

It was decided that a team led by Dr. Vinay, including Dr. Harsimran Kaur and Dr. Pratibha Kale, under the supervision of Prof. Jayanthi Savio, would prepare an initial draft and do the groundwork for its presentation, discussion, and deliberation at the ISMM conference in Chennai, to be held from 20-23rd February 2025.

Dr. Anupma Jyoti Kindo showed her concern regarding low registrations for ISMM 2025. The committee acknowledged this concern and discussed potential solutions. There is a feeling that registrations tend to occur last-minute, and it was suggested that Dr. Kindo could approach various national and international mycological and microbiology societies to advertise the conference among their members.

Department of Microbiology, Banaras Hindu University (BHU) organized a three day workshop on "Diagnostic Mycology: A walk through Basic to Advance" on 3-5th October,2024 under the leadership of Prof. Ragini Tilak, where 35 persons actively participated. On 11th November 2025, MGM Medical College Indore, MP organized a CME on the topic " Managing Fungal Infection in India: Key strategies" under the leadership of Dr. Anju Mahor, where 80 participants registered.

Finally, I remind members that the next ISMM conference will be in February 2025 at the SRM Medical College, Chennai. The last date for abstract submission has been extended to 15th January 2025. Dr. Kindo has already published the brochure and launched the website. We, the council members, request all ISMM members to actively participate to make the conference a success. We need all the help possible from our society for the successful execution of this important event.

I am signing off with best wishes for a happy and prosperous 2025!

Dr. Anup K Ghosh
General 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 ISMM, who during the span of his/her lifetime 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 ISMM 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 ISMM 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**

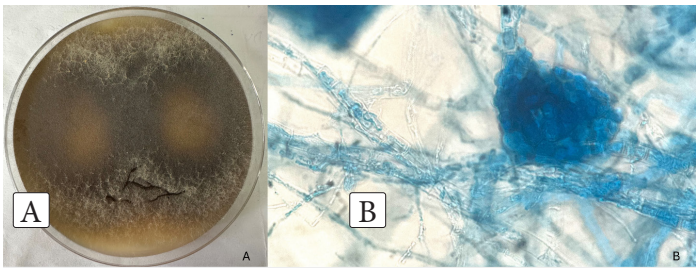
   Age limit -35 years (proof of age to be submitted). Must submit the curriculum vitae with list of publications and reprints of the papers in the field of medical mycology. Award will be given on the basis of the CV for the outstanding work in the field of medical mycology.

4. **Dr Kamalam Glaxo award in Dermatomycology**

   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 award session during the conference.

Answer for the last issue's identify the fungus (ISMM mycoses, Issue 27, Quiz June 2024)

A 59-year-old manual labourer presented with an injury to right eye while handling soil. He complained of pain, redness and decreased vision in the affected eye over the past 3 days. Slit lamp examination (SLE) showed a central corneal infiltrate affecting the inferior visual axis and hypopyon. Corneal scraping showed septate hyphae in potassium hydroxide (KOH) mount and grew white colonies on Sabouraud dextrose agar (SDA) within 48 hours of incubation, which later developed into a light brown colour. The culture on SDA and lactophenol cotton blue (LCB) mount are shown in figures A & B, respectively. Please identify the fungus to species level.

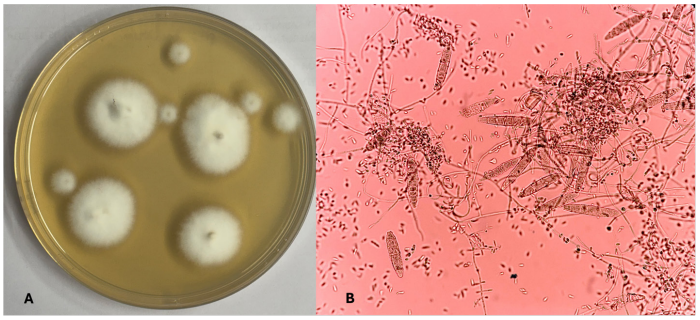


Correct identification: *Papulaspora equi*

(Correct answer was not received for this quiz)

Quiz: Can you identify the fungus?

Q. A 32-year-old female presented with two scaly lesions. She had a history of working on her private farm. Skin inspection revealed large, well-defined erythematous, raised and scaly plaques (around 5 and 3 cm in diameter) on the left forearm and left buttock, respectively. The plaques had borders studded with papules and pustules. The skin was scraped from the advancing border of lesions by a sterile scalpel blade. The scrapings were subjected to microbiological evaluation which included 10% potassium hydroxide (KOH) smear and culture on Sabouraud dextrose agar (SDA). KOH mount showed thin septate hyphae. SDA culture at 25°C on day 10 showed a creamy white powdery colony raised at center. (Figure A) The reverse of the colony was yellowish-brown. The lactophenol cotton blue mount from culture in shown in figure B. Please identify the fungus to species level.



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

Results of ISMM Mycology External Quality Assurance Program

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

Performance Report of the Participants (31st Batch, July 2024)

Total number of participating laboratories -186

S No.	Sample/ Code	Clinical details			Correct identification	Interpretation	Laboratory (%) given correct results
		Age/ Sex	Clinical feature/ Diagnosis	Source of specimen			
1	EQMM-1	71/M	Left nasal obstruction and discharge	Nasal scraping	*Hormographiella aspergillata*	Fungal Rhinosinusitis	56.2%
2	EQMM-2	٢٤/F	Watering and reduced vision in right eye	Corneal scraping	*Fusarium solani*	Mycotic keratitis	75.8%
3	EQMM-3	53/M	Headache and seizures, abscess in right parietal lobe	Pus from brain abscess	*Curvularia (Bipolaris) hawaiiensis*	Cerebral pheophyphomycosis	72.8%
4	EQMM-4	84/M	COVID+, dypsnea, hemoptysis	Lung biopsy	*Aspergillus fumigatus*	COVID associated pulmonary aspergillosis (CAPA)	93.8%
5	EQMM-5*	41/F	Sepsis	Blood culture	*Trichosporon inkin*	Trichosporonosis/ Fungemia	65.3%

Results of antifungal susceptibility testing performed for EQMM -5; Laboratories participating in AFST: 103 (55.17%)

(EQMM-5) Minimum inhibitory concentration	**Amphotericin B 1.0mg/L**	**Fluconazole 0.12mg/L**	**Voriconazole 0.03mg/L**	**Itraconazole 0.06mg/L**	**Posaconazole 0.03mg/L**
Participants results %	94.7%	98.9%	93.7%	77%	61.4%

Abstracts (July – December 2024)

Compiled by Dr. Joveeta Joseph

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

1. **Disseminated Aspergillosis in X-linked Agammaglobulinemia: Beyond the norm**

   Abarna Thangaraj[1], Archan Sil[1], Sumit Goel[1], Pandiarajan Vignesh[1], Amit Rawat[1], Ankur Kumar Jindal[2]

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J Clin Immunol. 2024 Oct 24:(1)45;15.doi: 10.1007/s-024-10875 5-01815.

Abstract

X-linked agammaglobulinemia (XLA) due to a mutation in Bruton's tyrosine kinase (BTK), leads to the arrested development of B cells at the pro-B cell stage. This results in absent B cells and severe hypogammaglobulinemia. XLA patients usually present with recurrent sinopulmonary infection. Bacterial infections are the commonest [2], fungal infections like Pneumocystis jirovecii, *Aspergillus* and *Candida* species are rarely reported and they are associated with mortality in XLA [3]. We report a 3.5-year-old boy with disseminated aspergillosis, an uncommon presentation of XLA. Despite treatment with antifungals, including voriconazole and amphotericin B, the patient succumbed to the illness. Genetic analysis revealed a pathogenic variant in the BTK gene (R28H), confirming XLA diagnosis. This case highlights the potential for severe fungal infections in XLA patients and suggests broader immune system dysregulation beyond B-cell defects.

Keywords: Antibody deficiency; *Aspergillus pneumonia*; CNS aspergillosis; Fungal infection; Hydrocephalus; Ring-enhancing lesions.

PMID: 39404906

2. **Phaeohyphomycosis: A 10-Year Study From a Tertiary Care Centre in South India**

   Rajeswari Kathiah[1], Saraswathy M P[2], Sathish Selvakumar[3], Ranjani Mohan[3]

Affiliations

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Cureus. 2024 Aug 8)16;25):e67718. doi: 10.7759/ cureus.67718. eCollection 2024 Aug.

Abstract

Background Phaeohyphomycosis, a fungal infection caused by dematiaceous fungi, presents a significant health challenge affecting both immunocompromised and immunocompetent individuals.

Despite its clinical importance, phaeohyphomycosis remains underrepresented in epidemiological studies, leading to gaps in our understanding of its prevalence, clinical manifestations, and associated risk factors. This retrospective study conducted in South India aims to address these gaps by examining the incidence, diverse clinical presentations, and other relevant epidemiological aspects of phaeohyphomycosis in patients referred for pathological examination. Objective To investigate the epidemiological trends, clinicopathological characteristics, and microbiological spectrum of phaeohyphomycosis in patients at a tertiary care center in South India over 10 years. Materials and methods This comprehensive study was conducted at Employees State Insurance Corporation Medical College & Post Graduate Institute of Medical Sciences and Research (ESIC Medical College and PGIMSR), Chennai, embodying a retrospective observational approach. Over a decade, researchers meticulously reviewed cases diagnosed with phaeohyphomycosis. This involved an in-depth analysis of patients' medical records to gather detailed information on presenting symptoms, history of thorn pricks, diabetic status, and other pertinent epidemiological data. Additionally, culture samples were selectively obtained from patients exhibiting abscesses or cystic swellings, followed by a thorough assessment of the culture reports. Results In the ten-year study period, a total of 46 cases were identified. Most lesions were solid or cystic and located on extremities, predominantly affecting the digits. Eight cases (17%) had a history of thorn prick injuries, and six cases (13%) were associated with diabetes mellitus. Microscopic examination revealed necrosis, granulomas, varying degrees of inflammatory infiltrates, giant cells, and pigmented fungal hyphae. In some cases, biopsies revealed pseudoepitheliomatous hyperplasia. Among the 19 cases where culture was performed, Alternaria was the most commonly isolated pathogen (42%). Conclusion The study brings to light the diagnostic challenges inherent in phaeohyphomycosis cases, which often eluded clinical diagnosis and were only conclusively identified via pathological examinations. While this research was primarily focused on outpatients presenting with minor symptoms, it underscores the potential for more severe clinical presentations in immunocompromised patients. Our findings emphasize the need for increased clinical awareness and the pivotal role of histopathological examination in accurately diagnosing phaeohyphomycosis, particularly in cases with extremity lesions. This study contributes significantly to the understanding of phaeohyphomycosis and advocates for ongoing research to better understand its epidemiology and clinical diversity.

PMID: 39318939

3. **Rhinocerebral mucormycosis: A clinicopathological analysis of COVID-19-associated mucormycosis**

Neelima Bahal[1], A R Piyush[1], Pooja Sharma Kala[1], Shruti Dogra[1], Naveen Thapliyal[1]

Affiliation

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J Family Med Prim Care. 2024 Aug;3257:(8)13 3263. doi:10.4103/jfmpc.jfmpc_42_24. Epub 2024 Jul 26.

Abstract

Background: During the coronavirus disease 2019 (COVD-19) pandemic, the incidence of mucormycosis also increased, especially affecting individuals who have had the COVID-19 infection in the past.

Aims: The aim of the study is to assess risk factors and clinical and histopathological features of mucormycosis in post-COVID-19 cases.

Methods: This is a retrospective study conducted in a tertiary care COVID-19-dedicated hospital, Dehradun, Uttarakhand, India, over a period of 2 months during the COVID-19 pandemic. All surgical specimens submitted for histopathology with a suspected diagnosis of mucormycosis were included. Histopathology was considered the gold standard. All histopathologically confirmed cases were studied in detail with respect to histopathology, clinico-radiological features, and microbiological results.

Results: Of 25 cases with clinical diagnosis of mucormycosis, nine were histopathologically confirmed as mucormycosis. Seven patients had diabetes, while two did not have any co-morbidity. The fungal load was heavy in 50% cases, and the proportion of necrosis was higher with diabetes mellitus, as compared to non-diabetic and non-co-morbidity patients. Angioinvasion (33.3% cases), soft-tissue invasion (44.4%), Splendor-Hoeppli phenomenon (44.4%), and neural invasion (11.1%) were also present. Mixed infection (Mucormycosis and Aspergillus species) was present in three of the cases who also had diabetes. The microbiological investigations were positive in only 55.5% cases.

Conclusion: Post-COVID Mucormycosis has fatal outcomes. Early diagnosis and treatment are the key to successful treatment. Early and reliable diagnosis can be offered by histopathological examination.

PMID: 39228572

4. **Antifungal Patterns of Dermatophytes: A Pathway to Antifungal Stewardship in Eastern India**

Satyendra P Yadav [1], Manoj Kumar [2], Kumari Seema [2], Abhay Kumar [2], Manju Boipai [2], Prabhat Kumar [3], Ashok K Sharma [2]

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Cureus. 2024 Jul 7)16;13):e64479. doi: 10.7759/cureus.64479. eCollection 2024 Jul.

Abstract

Background Dermatophytosis is a superficial fungal infection caused by a group of pathogenic keratinophilic fungi. The increase in the incidence of superficial fungal infections, combined with the emergence of antifungal resistance, represents both a global health challenge and a considerable economic burden. Recent years have witnessed a surge in dermatophytosis cases, accompanied by the emergence of antifungal-resistant strains. This study aimed to analyze the in vitro antifungal susceptibility patterns and determine the minimum inhibitory concentrations (MIC) of antifungal drugs among isolated species using the broth microdilution method. Methodology This cross-sectional study was conducted between September 2021 and August 2022. Patients with symptoms or clinical features of fungal infection, including skin, hair, and nail lesions indicative of Tinea infections, were included. Samples underwent processing, including potassium hydroxide (KOH) mounting, direct microscopic examination, and culture on Sabouraud Dextrose Agar (SDA) with antibiotics. Antifungal susceptibility testing was subsequently conducted. Results Trichophyton mentagrophytes emerged as the most common isolate among patients with Tinea infections. MIC values of various drugs were analyzed, with itraconazole exhibiting a minimum MIC of 0.03 µg/ml and a maximum of 0.50 µg/ml. Terbinafine showed an MIC of 0.010 µg/ml and a maximum of 1.00 µg/ml. Ketoconazole had a minimum MIC of 0.03 µg/ml and a maximum of 0.50 µg/ml. Fluconazole exhibited a minimum MIC of 0.10 µg/ml and a maximum of 1.00 µg/ml. Lastly, miconazole demonstrated a minimum MIC of 0.03 µg/ml and a maximum of 2.00 µg/ml. Conclusion Accurate diagnosis is crucial for fungal infections to enable early treatment and reduce transmission. With an increasing trend in resistance among dermatophytes, there is a growing need to conduct susceptibility testing of antifungal agents, particularly in cases of long-term infections, recurrent infections, and individuals who do not respond to medication.

Keywords: antifungal sensitivity; dermatophytes; resistance; tinea; trichophyton.

PMID: 39135841

5. **Mucormycosis in an Immunocompetent Patient Recovering From Dengue Fever**

Sushmitha D J[1], Kalyan Kumar Reddy Annapureddy[2], Nishan Poojary[1], Santhosh Balapanga[3], Bindu Kumari[2]

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Cureus. 2024 Jul 7)16;23):e65212.doi: 10.7759/cureus.65212. eCollection 2024 Jul.

Abstract

Mucormycosis is a rare yet aggressive fungal infection. Despite its rarity, India has experienced a surge in cases during the post-COVID-19 era. The high mortality rate associated with this infection necessitates early diagnosis, intervention, and aggressive treatment. Typically, it is observed in immunocompromised patients, where the disease progresses rapidly and leads to unfavorable outcomes. However, occurrences in previously healthy individuals are not uncommon. Dengue has been occasionally associated with mucormycosis in the post-recovery phase. This case report highlights the importance of heightened clinical suspicion and early intervention in patients with recent dengue infections and chronic sinus conditions. It explores potential risk factors, such as dengue-related immune alterations, environmental exposures, and anatomical alterations that may contribute to the development of mucormycosis in otherwise healthy individuals.

PMID: 39176311

6. **Fungal Intracranial Infections (Central Nervous System-Invasive Fungal Disease) in Patients With Haematological Disorders-A Single-Centre Retrospective Study**

Sohini Chattopadhyay[1], Lydia Jennifer Sumanth[2], Harshad Arvind Vanjare[3], Sharon Anbumalar Lionel[1], Sushil Selvarajan[1], Uday Kulkarni[1], Fouzia N Abubacker[1], Kavitha M Lakshmi[1], Anu Korula[1], Aby Abraham[1], Vikram Mathews[1], Joy Sarojini Michael[2], Biju George[1]

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Mycoses. 2024 Oct;10)67):e13809. doi: 10.1111/myc.13809.

Abstract

Background: Invasive fungal disease (IFD) is a sinister complication encountered in patients with haematological disorders. When occurring in the central nervous system (CNS), IFDs can have catastrophic outcomes.

Objectives: To study the clinical presentation, predisposing etiological factors, and prognosis of a CNS-IFD in a patient with a haematological disorder.

Patients and methods: This is a retrospective study focusing on the clinical profile, diagnosis, treatment strategy and outcomes of 43 patients with an underlying haematological disorder, who were diagnosed with CNS-IFD between 2018 and 2022.

Results: Of the 43 patients, 18 were chemotherapy recipients, while 23 were stem cell transplant (SCT) recipients and 2 presented with CNS-IFD at diagnosis. AML/MDS (37.2%) and ALL (18.6%) were the predominant underlying diagnoses. A sudden deterioration in sensorium (53.5%) was the earliest clinical sign, while T2 hyperintensities (26.8%), vascular involvement (26.8%) and ring-enhancing lesions (16.3%) were the commonest radiological findings, with all patients exhibiting diffusion restriction in diffusion-weighted images. Microbiological evidence of infection was obtained in all patients; however, culture positivity was established in only 25 patients. *Rhizopus spp* (23.2%) and *Aspergillus spp* (20.9%) were implicated in most cases. Overall survival of the cohort was 27.9% at a median follow-up of 6 months. In patients who succumbed, the median time to death was 4 days (0-46).

Conclusion: CNS-IFD is associated with very poor survival in patients undergoing chemotherapy or an SCT, urging the need for prompt diagnosis and initiation of suitable antifungal therapy.

PMID: 39462651

7. **A double-masked, sham-controlled trial of rose bengal photodynamic therapy for the treatment of fungal and acanthamoeba keratitis: Rose Bengal Electromagnetic Activation with Green Light for Infection Reduction (REAGIR) study**

N V Prajna[1], P Lalitha[1], S Sharma[1], D de Freitas[2], A Höfling-Lima[2], N Varnado[3], S Abdelrahman[4], V Cavallino[4], B F Arnold[4 5], T M Lietman [4 6 5], J Rose-Nussbaumer [7 8 9]

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Trials. 2024 Aug 566:(1)25;28. doi: 10.1186/s3-08376-024-13063.

Abstract

Background: Infectious keratitis secondary to fungus or acanthamoeba often has a poor outcome despite receiving the best available medical therapy. In vitro rose bengal photodynamic therapy (RB-PDT) appears to be effective against fungal and acanthamoeba isolates (Atalay HT et al., Curr Eye Res 43:1322-5, 2018, Arboleda A et al. Am J Ophthalmol 158:64-70, 2014). In one published series, RB-PDT reduced the need for therapeutic penetrating keratoplasty in severe bacterial, fungal, and acanthamoeba keratitis not responsive to medical therapy.

Methods: This international, randomized, sham and placebo controlled 2-arm clinical trial randomizes patients with smear positive fungal and acanthamoeba and smear negative corneal ulcers in a 1:1 fashion to one of two treatment arms: 1) topical antimicrobial plus sham RB-PDT or 2) topical antimicrobial plus RB-PDT.

Discussion: We anticipate that RB-PDT will improve best spectacle-corrected visual acuity and also reduce complications such as corneal perforation and the need for therapeutic penetrating keratoplasty. This study will comply with the NIH Data Sharing Policy and Policy on the Dissemination of NIH-Funded Clinical Trial Information and the Clinical Trials Registration and Results Information Submission rule. Our results will be disseminated via ClinicalTrials.gov website, meetings, and journal publications. Our data will also be available upon reasonable request.

PMID: 39192339

8. **Fluconazole-loaded Hyaluronic Acid-modified Transfersomal Hydrogels Containing D-panthenol for Ocular Delivery in Fungal Keratitis Management**

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Affiliations

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Abstract

Background: Fungal keratitis (mycotic keratitis) is an eye infection in which the cornea is infected by fungi and such fungal keratitis management can be effectively possible by ocular administration of antifungal drugs.

Objective: The main objectives of the present research were to develop and evaluate fluconazoleloaded transfersomal hydrogels for ocular delivery in the effective management of fungal keratitis.

Methods: A 23 factorial design-based approach was used for statistical optimization, where (A) the ratio of lipid to edge activators, (B) the amount of hyaluronic acid (% HA), and (C) the ratio of edge activators (sodium deoxycholate to Span 80) were taken as three factors. The average vesicle diameter (Z, nm) of transfersomes was taken as a response. Further, fluconazole-loaded transfersomes (FTO) were incorporated into 1% Carbopol 940-based hydrogel (OF1) and 2% HMPC K4M-based hydrogel (OF2) containing D-panthenol (5% w/w).

Results: The optimal variable setting for the optimized formulations of FTO was (A) = 9.15, (B) = 0.30%, and (C) = 3.00. FTO exhibited 66.39 nm Z, 0.247 polydispersity index, - 33.10 mV zeta potential, and 65.38 ± 1.77 % DEE, and desirable elasticity. TEM image of FTO demonstrated a unilamellar vesicular structure. The ex vivo ocular permeation of fluconazole from transfersomal hydrogels was sustained over 24 h. All the transfersomal hydrogels showed good bioadhesion and excellent antifungal activity with respect to the zone of inhibition against *Candida albicans* than Aspergillus fumigates, in vitro. HET-CAM study results demonstrated that both the hydrogels were nonirritant and safe for ocular. Short-term physical stability study suggested the stability of the developed formulation.

Conclusion: The current research demonstrated a new way to enhance the ocular penetration of fluconazole via transfersomal hydrogel formulations for ocular delivery in the effective management of fungal keratitis.

PMID: 39428929

9. **Vidarabine as a novel antifungal agent against *Candida albicans*: insights on mechanism of action**

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Int Microbiol. 2024 Aug 10. doi: 10.1007/s-00565-024-10123z.

Abstract

Around 1.5 million mortality cases due to fungal infection are reported annually, posing a massive threat to global health. However, the effectiveness of current antifungal therapies in the treatment of invasive fungal infections is limited. Repurposing existing antifungal drugs is an advisable alternative approach for enhancing their effectiveness. This study evaluated the antifungal efficacy of the antiviral drug vidarabine against *Candida albicans* ATCC 90028. Antifungal susceptibility testing was performed by microbroth dilution assay and further processed to find the minimum fungicidal concentration. Investigation on probable mode of vidarabine action against *C. albicans* was assessed by using the ergosterol reduction assay, reactive oxygen species (ROS) accumulation, nuclear condensation, and apoptosis assay. Results revealed that *C. albicans* was susceptible to vidarabine action and exhibited minimum inhibitory concentration at 150 µg/ml. At a concentration of 300 µg/ml, vidarabine had fungicidal activity against *C. albicans*. 300 µg/ml vidarabine-treated *C. albicans* cells demonstrated 91% reduced ergosterol content. Annexin/FITC/PI assay showed that vidarabine (150 µg/ml) had increased late apoptotic cells up to 31%. As per the fractional inhibitory concentration index, vidarabine had synergistic activity with fluconazole and caspofungin against this fungus. The mechanism underlying fungicidal action of vidarabine was evaluated at the intracellular level, and probably because of increased nuclear condensation, enhanced ROS generation, and cell cycle arrest. In conclusion, this data is the first to report that vidarabine has potential to be used as a repurposed antifungal agent alone or in combination with standard antifungal drugs, and could be a quick and safe addition to existing therapies for treating fungal infections.

PMID: 39126447

10. **Diagnosis of invasive aspergillosis in haemato-oncology patients in a routine diagnostic setting**

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Med Mycol. 2024 Oct 4;62(10):myae100. doi: 10.1093/mmy/myae100.

Abstract

Invasive Aspergillosis (IA) is a potentially lethal infection in high-risk haemato-oncology patients. Since traditional diagnostic methods have many inherent challenges, Polymerase Chain Reaction (PCR) has been used to diagnose IA. This prospective study evaluated a commercial AsperGenius multiplex real-time PCR for its clinical utility in diagnosing IA compared with galactomannan (GM) testing serum samples from haemato-oncology patients with clinically suspected IA. A total of 107 patients were recruited between April 2022 and March 2023. Serum samples (n = 113) collected from those patients for the routine diagnosis by GM Enzyme Linked Immuno-Sorbent Assay (ELISA) were subjected to PCR. The patients were categorised into probable, possible, and no IA based on revised (2020) and previous (2008) European Organization for Research and Treatment of Cancer and the National Institute of Allergy and Infectious Diseases Mycoses Study Group (EORTC-MSG) criteria. The performance characteristics of PCR and GM were calculated against the EORTC criteria by combining probable and possible cases as diseased groups. Among the 107 recruited patients, 93 were categorised into probable/possible IA (diseased group) and 14 into no IA group. The PCR was positive in 53 samples from 49 patients. The sensitivity and specificity of single positive PCR and GM were 51.61% [95% confidence interval, 41-62], 92.86% (66.1-99.8) and 26.88% (18.2-37.1), 92.86% (66.1-99.8), respectively. The combination-based strategy (GM and/or PCR positive) exhibited a moderate sensitivity of 62.37% (51-72.2) and a specificity of 85.71% (57.2-98.2). To conclude, the combined strategy of serum GM and/

or PCR positivity, along with radiological findings that fulfilled the EORTC/MSG criteria, has improved the diagnosis of probable IA among high-risk haematological patients with clinically suspected IA.

PMID: 39394658

11. **Exploring the Arsenal of Novel Antifungal Drug Targets for Combating Fungal Infections**

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Curr Pharm Biotechnol. 2024 Sep 13.doi: 011389201030488/10.2174 0240828075411.

Abstract

Fungal infections contribute to over 1.5 million fatalities each year, with cutaneous mycoses standing as prominent global infections. The spectrum of these mycoses varies widely, encompassing enduring afflictions like ringworm, localized infections such as tinea capitis, recurrent instances like vaginal candidiasis, and potentially fatal systemic infections impacting multiple organ systems. The escalating recognition of the health and socioeconomic ramifications associated with fungal pathogens underscores their importance in contemporary discourse. On a global scale, projections indicate that over 300 million individuals experience significant fungal infections annually, resulting in a mortality rate exceeding 1.5 million deaths per year. Alarmingly, resistance to commonly used antifungal drugs was on the rise, with some reports suggesting that over 10% of *Candida* bloodstream isolates worldwide were resistant to fluconazole, a commonly prescribed antifungal medication. Therefore, there is an immediate need to increase the accessibility of new antifungal medications while minimizing their costs and adverse effects. Fungi, as heterotrophic organisms, acquire nutrients through absorption. Their filamentous structure, composed of hyphae, facilitates efficient nutrient uptake by secreting enzymes that break down complex organic matter into simpler compounds. These organisms exhibit remarkable adaptability in responding to environmental cues, adjusting growth rates, and altering morphological features. Fungi regulate their metabolism intricately, undergoing various metabolic pathways for energy production and utilizing diverse substrates for respiration. Additionally, they exhibit distinctive reproductive strategies, employing both sexual and asexual modes of reproduction, contributing to their genetic diversity and resilience in diverse ecosystems. We now have more information than ever on the origins of infection as well as the physiology of fungi cells, giving us the chance to use it to produce new generations of antifungals. This review includes various novel antifungal drug targets showing their possible effects via different mechanisms aiming at vital functions like GPI synthesis, cell wall synthesis, hyphal growth, and other essential pathways responsible for fungal growth.

PMID: 39279690

12. **Evaluation of Fungitell (1,3)-β-D-glucan assay in tear samples for rapid diagnosis of fungal keratitis**

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Abstract

Fungal keratitis (FK) is a serious suppurative and ulcerative corneal infection leading to blindness and vision loss. Rapid diagnosis of FK can contribute to prompt clinical management with early recovery. The study aimed to standardize the detection of (1,3)-β-D-glucan (BDG) and establish the diagnostic cut-off concentration in tears of suspected FK patients along with non-infected controls. This prospective multicentric study was conducted between the period of August 2022 and April 2024. Samples were collected from three tertiary eye-care facilities across India. All suspected FK patients were enrolled in the study. Prior to tear collection, the eye and eyelid were gently cleansed using sterile normal saline (NS) and lint-free tissue paper. Subsequently, 50 µL of sterile NS was instilled into the eye, followed by tear sample collection after 60 s using sterile fine microtips. Tear samples were collected from the contralateral eyes of the FK patients, and those from healthy volunteers served as controls. The concentration of BDG in tears in varying dilutions was quantitatively measured using the Fungitell Assay Kit (Associates of Cape Cod, East Falmouth, Massachusetts). A total of 53 tear samples were analyzed at 1:10 and 1:20 dilutions. The receiver operating curve revealed an area under the curve (AUC) of 0.919 for the 1:10 dilution, with a cut-off value of 123 pg/mL, yielding a sensitivity of 100% and specificity of 84.85%. The corresponding Youden Index was 0.798. At the 1:20 dilution, the AUC was 0.898 with a cut-off of 84 pg/mL, achieving a sensitivity of 70% and specificity of 96.88% with a Youden Index of 0.670. Given the higher specificity at the 1:20 dilution, it was further validated in 145 tear samples. The validation cohort demonstrated a sensitivity of 95.56%, specificity of 83%, positive predictive value (PPV) of 71.67%, negative predictive value (NPV) of 97.65%, and diagnostic odds ratio of 112.4. Notably, a significantly higher BDG concentration ($P < 0.0001$) was observed in infected tear samples compared to controls (128.5 ± 270.6 vs 31.32 ± 37.31). Detection of BDG in tear samples is a new, non-invasive, and rapid technique showing excellent performance and can be effectively implemented for diagnosing FK in laboratories.

PMID: 39503507

13. **Sex Differences in Allergic Bronchopulmonary Aspergillosis and its Impact on Exacerbations**

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Mycopathologia. 2024 Oct 90:(6)189;3. doi: 10.1007/s-024-11046 8-00893.

Abstract

The impact of sex on allergic bronchopulmonary aspergillosis (ABPA) outcomes remains uncertain. We retrospectively included ABPA subjects per the revised International Society for Human and Animal Mycology ABPA working group criteria over 13 years. We compared the clinical features, lung function, immunological tests, imaging, and ABPA exacerbation rates between men and women. Our

primary objective was to assess whether women experience higher ABPA exacerbations than men. We included 731 ABPA subjects (mean age, 34.5 years; 49.5% women). Women with ABPA were older and had underlying asthma more frequently than men. There was no difference in lung function, immunological investigations, and imaging between men and women. ABPA exacerbations occurred in a slightly higher proportion of women than men (44.5% vs. 38.2%) but did not reach statistical significance (p = 0.09). We did not find a significant sex difference in ABPA exacerbation rates. Prospective studies should confirm our findings.

Keywords: Aspergillus; Allergic bronchopulmonary mycosis; Allergy; Asthma; Bronchiectasis.

PMID: 39361087

14. **Quality by design driven development of lipid nanoparticles for cutaneous targeting: a preliminary approach**

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Abstract

Fungal infections are the fourth common cause of infection affecting around 50 million populations across the globe. Dermatophytes contribute to the majority of superficial fungal infections. Clotrimazole (CTZ), an imidazole derivative is widely preferred for the treatment of topical fungal infections. Conventional topical formulations enable effective penetration of CTZ into the stratum corneum, however, its low solubility results in poor dermal bioavailability, and variable drug levels limit the efficacy. The aim was to increase dermal bioavailability and sustain drug release, thereby potentially enhancing drug retention and reducing its side effects. This work evaluated the CTZ loaded solid lipid nanoparticles (SLN) consisting of precirol and polysorbate-80 developed using high pressure homogenization and optimized with QbD approach. Prior to release studies, CTZ-SLNs were characterized by different analytical techniques. The laser diffractometry and field emission scanning electron microscopy indicated that SLNs were spherical in shape with mean diameter of 450 ± 3.45 nm. DSC and XRD results revealed that the drug remained molecularly dispersed in the lipid matrix. The CTZ-SLNs showed no physicochemical instability during 6 months of storage at different temperatures. Further, the Carbopol with its pseudoplastic behavior showed a crucial role in forming homogenous and stable network for imbibing the CTZ-SLN dispersion for effective retention in skin. As examined, in-vitro drug release was sustained up to 24 h while ex-vivo skin retention and drug permeation studies showed the highest accumulation and lowest permeation with nanogel in comparison to pure drug and Candid® cream. Further, the in-vivo antifungal efficacy of nanogel suggested once-a-day application for 10 days, supported by histopathological analysis for complete eradication infection. In summary, the findings suggest, that nanogel-loaded with CTZ-SLNs has great potential for the management of fungal infections caused by *Candida albicans*.

PMID: 39145818

15. **Candidaemia and Central Line-Associated Candidaemia in a Network of Indian ICUs: Impact of COVID-19 Pandemic**

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Mycoses. 2024 Sep;9)67):e13790. doi: 10.1111/myc.13790.

Abstract

Background and objectives: Candidaemia is a potentially life-threatening emergency in the intensive care units (ICUs). Surveillance using common protocols in a large network of hospitals would give meaningful estimates of the burden of candidaemia and central line associated candidaemia in low resource settings. We undertook this study to understand the burden and epidemiology of candidaemia in multiple ICUs of India, leveraging the previously established healthcare-associated infections (HAI) surveillance network. Our aim was also to assess the impact that the pandemic of COVID-19 had on the rates and associated mortality of candidaemia.

Methods: This study included adult patients from 67 Indian ICUs in the AIIMS-HAI surveillance network that conducted BSI surveillance in COVID-19 and non-COVID-19 ICUs during and before the COVID-19 pandemic periods. Hospitals identified healthcare-associated candidaemia and central line associated candidaemia and reported clinical and microbiological data to the network as per established and previously published protocols.

Results: A total of 401,601 patient days and 126,051 central line days were reported during the study period. A total of 377 events of candidaemia were recorded. The overall rate of candidaemia in our network was 0.93/1000 patient days. The rate of candidaemia in COVID-19 ICUs (2.52/1000 patient days) was significantly higher than in non-COVID-19 ICUs (1.05/patient days) during the pandemic period. The rate of central line associated candidaemia in COVID-19 ICUs (4.53/1000 central line days) was also significantly higher than in non-COVID-19 ICUs (1.73/1000 central line days) during the pandemic period. Mortality in COVID-19 ICUs associated with candidaemia (61%) was higher than that in non-COVID-19 ICUs (41%). A total of 435 Candida spp. were isolated. C. tropicalis (26.7%) was the most common species. C. auris accounted for 17.5% of all isolates and had a high mortality.

Conclusion: Patients in ICUs with COVID-19 infections have a much higher risk of candidaemia, CLAC and its associated mortality. Network level data helps in understanding the true burden of candidaemia and will help in framing infection control policies for the country.

PMID: 39278818

16. **Bridging Diagnostic Gaps: Utilising HiCrome Agar and Tetrazolium Reduction Medium for the Rapid and Presumptive Identification and Speciation of Candida Species in Vulvovaginal Candidiasis in Low-Resource Environments**

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Abstract

Background Vulvovaginal candidiasis (VVC) is a common fungal infection caused by an overgrowth of *Candida* species, primarily *Candida albicans* (*C. albicans*). Using HiCrome agar and tetrazolium reduction medium offers cost-effectiveness in *Candida* detection by eliminating the need for additional tests, reducing equipment costs compared to automated systems, and simplifying workflow with direct species identification while maintaining high specificity. They expedite detection by directly identifying *Candida* species based on colony colour, bypassing the multiple steps of phenotypic methods. This efficiency saves time in the laboratory, providing rapid results without the extended processing times associated with automated systems and facilitating prompt diagnosis and treatment decisions. These diagnostic tools are especially valuable in low-resource environments where a quick and accurate diagnosis of VVC is crucial for effective treatment and management of antifungal resistance. Aims and objectives This study aims to evaluate the efficacy of HiCrome agar and tetrazolium reduction medium›s efficacy in speciating *Candida* species in VVC cases. Materials and methods A cross-sectional observational study was conducted at Saveetha Medical College and Hospitals, Chennai, India, over six months. High vaginal swabs from 126 patients suspected of VVC were collected and plated on Sabouraud dextrose agar (SDA), HiCrome Candida differential agar (Himedia, Mumbai, India), and tetrazolium reduction medium. The results were compared with those obtained from the VITEK2 compact system (bioMérieux, Marcy-l'Étoile, France). Results Of the 126 samples, 74.6% showed single yeast infections, 7.9% displayed mixed yeast infections, and 17.5% showed no growth. A total of 114 *Candida* isolates were identified. Both HiCrome agar and tetrazolium reduction medium accurately identified all isolates, with complete concordance with the VITEK2 compact system. The most commonly isolated species were *C. albicans* (%55.2), *Candida tropicalis* (%32.4), *Candida glabrata* (%8.8), and *Candida parapsilosis* (%3.6). Both media provided rapid and accurate presumptive identification in low-resource settings. Conclusions HiCrome agar and tetrazolium reduction medium demonstrated high sensitivity and specificity in identifying Candida species. These methods are reliable for rapid and accurate diagnosis, particularly in resource-limited settings. However, they may require supplementary tests for definitive species identification. The adoption of these diagnostic tools represents a significant advancement in clinical microbiology, improving VVC management and addressing antifungal resistance.

PMID: 39205720

17. **Unveiling the Innate and Adaptive Immunity Interplay: Global Transcriptomic Profiling of the Host Immune Response in *Candida albicans* Endophthalmitis in a Murine Model**

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ACS Omega. 2024 Sep 30;9(40):41491-41503. doi: 10.1021/acsomega.4c05081. eCollection

Abstract

Intraocular fungal infection poses a significant clinical challenge characterized by chronic inflammation along with vision impairment. Understanding the host defense pathways involved in fungal endophthalmitis will play a pivotal role in identifying adjuvant immunotherapy. Clinical isolates of *Candida albicans* (15,000 CFU/μL) were intravitreally injected in C57BL/6 mice followed by enucleation at 24 and 72 h postinfection. Histopathological analysis was performed to evaluate the retinal changes and the disease severity. RNA-seq analysis was conducted on homogenized eyeballs to assess the relevant gene profiles and their differentially expressed genes (DEGs). Pathway enrichment analysis was performed to further annotate the functions of the DEGs. Histopathological analysis demonstrated a higher disease severity with increased inflammatory cells at 72 hpi and transcriptome analysis revealed 27,717 DEGs, of which 1493 were significant (adj *p* value ≤0.05, FC ≥ 1.5). Among these, 924 were upregulated, and 569 were downregulated. Majority of the upregulated genes were associated with the inflammatory/host immune response and signal transduction and enriched in the T-cell signaling pathway, natural killer cell-mediated cytotoxicity, C-type receptor signaling pathway, and NOD-like receptor signaling pathway. Furthermore, inflammation-associated genes such as T-cell surface glycoprotein CD3, cathelicidin antimicrobial peptide, and lymphocyte cell-specific protein tyrosine kinase were enriched, while pathways such as MAPK, cAMP, and metabolic pathways were downregulated. Regulating the T-cell influx could be a potential strategy to modulate excessive inflammation in the retina and could potentially aid in better vision recovery in fungal endophthalmitis.

PMID: 39398165

18. **Synergistic action of lactoferrin and its derived functional fragments as a promising therapeutic agent in combating mucormycosis**

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Future Microbiol. 2024 Jul 866-857:(10)19;2.doi: 17460913.2024.2352263/10.1080. Epub 2024 Jun 21.

Abstract

Aim: Currently, we have limited armamentarium of antifungal agents against Mucorales. There is an urgent need to discover novel antifungal agents that are effective, safe and affordable.

Materials & methods: In this study, the anti-Mucorale action of native lactoferrin (LF) and its functional fragments CLF, RR6 and LFcin against three common Mucorale species are reported. The synergistic action of LF with antifungal agents like amphotericin B, isavuconazole and posaconazole was analyzed using checkerboard technique.

Results: All the three mucor species showed inhibition when treated with fragments. The checkerboard assay confirmed that native LF showed the best synergistic action against Mucorales in combination with Amphotericin B.

Conclusion: These results highlight the potential therapeutic value of native LF against Mucorales.

PMID: 38904282

19. **Molecular epidemiology of seborrheic dermatitis/dandruff associated Malassezia species from northern India**

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Med Mycol. 2024 Oct 4;62(10):myae104. doi: 10.1093/mmy/myae104.

Abstract

Malassezia is a commensal that sometimes becomes pathogenic under the influence of diverse factors. Several species of Malassezia are difficult to culture, making traditional methods of identification challenging. The problem with molecular typing of Malassezia in association with seborrheic dermatitis/dandruff (SD/D) arises due to the unavailability of these fastidious yeast cultures. The aim of the study was to investigate the association between fluorescent amplified fragment length polymorphism (FAFLP) genotypes, disease state (SD/D), and the geographic distribution of *M. globosa, M. restricta, and M. arunalokei*. In total, 154 isolates representing *M. globosa* (n = 85), *M. restricta* (n = 55), and *M. arunalokei* (n = 14) from lesional/non-lesional areas of SD/D patients and healthy controls residing in the rural (n = 77) and urban (n = 77) areas of northern India were included. A strategy based on the FAFLP methodology was developed using two endonuclease enzymes (EcoRI and HindIII). *M. globosa, M. restricta, and M. arunalokei* formed 11, 3, and 2 FAFLP clusters, respectively. Disease-specific strains of *M. restricta and M. arunalokei* preferentially tend to cause SD/D. *M. restricta and M. arunalokei* showed less genetic variation. *M.globosa* showed higher genetic diversity. FAFLP clusters revealed the existence of geographically specific strains in *M. restricta, M. arunalokei, and M. globosa*. Our findings suggest that certain Malassezia strains are not only disease-specific but also geographically distinct.

Keywords: Malassezia; FAFLP; molecular epidemiology; seborrheic dermatitis.

PMID: 39419782

20. **Antifungal resistance, clinical outcome and clinico-microbiological correlation in ocular infections due to common melanized fungi *Curvularia lunata* and *Lasiodiplodia theobromae* in South India**

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J Med Microbiol. 2024 Nov;11)73). doi: 10.1099/jmm.0.001924.

Abstract

Aim. Melanized fungi were rarely studied for their antifungal resistance (AFR) or clinical outcome, despite rising incidence of melanized fungal ocular infections and AFR in general. We report the antifungal resistance patterns, clinical outcome and clinico-microbiological correlation in two commonly isolated melanized fungi from ocular infections, *Curvularia lunata* and *Lasiodiplodia theobromae*, at a tertiary eyecare centre in South India.

Gap statement. Despite melanized fungi accounting for a significant proportion of ocular fungal infections in the Indian subcontinent, and despite there being a limited selection of effective antifungal agents available for these infections, the existing data and studies on these issues remain sparse. Therefore, this study aimed to investigate the prevalence of antifungal resistance in two of the most common melanized fungal pathogens in ocular infections, *Curvularia lunata* and *Lasiodiplodia theobromae* and correlate it with the treatment given and the clinical outcome in patients.

Methodology. Electronic medical records provided the clinical data. Standard broth microdilution was performed for antifungal susceptibility testing (AFST) in 30 isolates (17 *C. lunata* and 13 *L. theobromae*) for amphotericin B and natamycin (polyenes): voriconazole, ketoconazole, posaconazole, itraconazole and fluconazole (azoles) and caspofungin (echinocandin). Multidrug resistance (MDR) was defined as resistance to more than or equal to two classes of antifungals. DNA sequencing was performed for the isolates for species confirmation. The multivariate analysis was done for determining poor prognostic factors.

Results. AFST showed highest susceptibility of study isolates for voriconazole (%83.3 isolates), followed by natamycin (%80), fluconazole (%80), itraconazole (%76.7), ketoconazole (%70), posaconazole (%66.7), caspofungin (%66.7) and lastly amphotericin B (%63.3). All patients empirically received topical natamycin; additional oral ketoconazole/intraocular voriconazole was administered in select few. MDR was strongly associated with poor clinical outcome (multivariate analysis: $P = 0.03$, odds ratio = 7.8). All patients had microbial keratitis, one progressed to endophthalmitis. Additionally, therapeutic penetrating keratoplasty was required in %40 of cases. Globe salvage was possible in %80 patients, though good visual outcome was seen in only half of them. Both, anatomical and visual outcomes, were poor in %20 of patients. DNA sequencing showed *C. lunata* as the highest study species.

Conclusion. *C. lunata* and *L. theobromae* showed varying *in vitro* antifungal susceptibility and clinical outcome in ocular infections. Voriconazole had significantly higher activity, while amphotericin B had lower activity *in vitro* for these melanized fungi. MDR isolates showed poorer clinical outcome.

PMID: 39508732

21. **Clinical spectrum, phenotypic and molecular characterization, and antifungal susceptibility of an emerging human pathogen, *Acrophialophora*, from India**

Harsimran Kaur[1], Parakriti Gupta[2], Haseen Ahmad[1], Shamanth Adekhandi Shankarnarayan[3], Pravin Salunke[4], Deepak Bansal[5], Anand Shah[6], Bansidhar Tarai[7], Kamlesh Patel[8], Nidhi Singla[2], Arghadip Samaddar[9], Neha Jain[10], Anup Ghosh[1], Arunaloke Chakrabarti[11], Shivaprakash M Rudramurthy[1]

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Med Mycol. 2024 Jul 7)62;4):myae061. doi: 10.1093/mmy/myae061.

Abstract

Acrophialophora is implicated in superficial and invasive infections, especially in immunosuppressed individuals. The present study was undertaken to provide clinical, microbiological, phylogenetic, and antifungal susceptibility testing (AFST) profile of *Acrophialophora* isolated from India. All the isolates identified as Acrophialophora species at the National Culture Collection for Pathogenic Fungi, Chandigarh, India were revived. Phenotypic and molecular characterization was performed, followed by temperature studies, scanning electron microscopy (SEM), and AFST. We also performed systematic review of all the cases of Acrophialophora species reported till date. A total of nine isolates identified as Acrophialophora species were identified by molecular method as *A. fusispora* (n = 8) and A. levis (n = 1), from brain abscess (n = 4), respiratory tract (n = 3), and corneal scraping (n = 2). All patients but two had predisposing factors/co-morbidities. Acrophialophora was identified as mere colonizer in one. Temperature studies and SEM divulged variation between both species. Sequencing of the internal transcribed spacer ribosomal DNA and beta-tubulin loci could distinguish species, while the LSU ribosomal DNA locus could not. AFST showed the lowest minimum inhibitory concentrations (MICs) for triazoles and the highest for echinocandins. Systematic literature review revealed 16 cases (11 studies), with ocular infections, pulmonary and central nervous system infections, and *A. fusispora* was common species. All the patients except three responded well. High MICs were noted for fluconazole, micafungin, and caspofungin. This is the first study delineating clinical, phenotypic, and genotypic characteristics of *Acrophialophora* species from India. The study highlights microscopic differences between both species and emphasizes the role of molecular methods in precise identification. Triazoles appear to be the most effective antifungals for managing patients.

PMID: 38857886

22. **Utility of intraoperative scoring system in rhino-orbital mucormycosis as a prognostic tool**

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Acta Otorhinolaryngol Ital. 2024 Oct;44(5):313-321. doi: 10.14639/0392-100X-N2705.

Abstract

Objective: To assess the utility of an intraoperative scoring system for mucormycosis and to predict prognosis by comparing the score with postoperative outcomes.

Methods: This study was conducted among 80 patients with mucormycosis who underwent surgical management with mandatory pterygopalatine fossa and infratemporal fossa exploration. All cases were scored using our intraoperative scoring assessment tool. Postoperative outcomes in terms of favourable prognosis and mortality were evaluated and compared with demographics, clinical history and intraoperative findings.

Results: An intraoperative score of more than 25 was statistically significant in predicting mortality ($p < 0.0001$). In all, 86.7% of patients with a score above 25 succumbed to the disease. Statistical significance of mortality ($p < 0.05$) was observed in those with involvement of pterygopalatine fossa (78.9%), orbit (73.7%),

infratemporal fossa (57.9%), cribriform plate (36.8%) and those with history of intake of antiviral drugs (47.4%), use of supplemental oxygen (31.6%) and renal failure (26.3%).

Conclusions: This study enabled better prediction of postoperative prognosis in mucormycosis and reiterated the importance of exploration of pterygopalatine fossa and infratemporal fossa in management and prognostication of invasive fungal sinusitis.

PMID: 39526768

23. ***Fusarium* spp. causing invasive disease in humans: A case series from north India**

Sudesh Gourav [1], Himanshu Mishra [1], Immaculata Xess [1], Ashu Seith Bhalla [2], Stuti Chandola [2], Sonakshi Gupta [1], Kavi Priya Appasami [1], Balaji Dattatraya Shukla [3], Sameer Bakhshi [4], Aish Manhas [1], Mragnayani Pandey [1], Bhaskar Rana [1], Gagandeep Singh [1]

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Med Mycol. 2024 Nov 11)62;12):myae111. doi: 10.1093/mmy/myae111.

Abstract

Owing to their inherent resistance to different classes of antifungals, early identification of Fusarium spp. is crucial. In this study, 10 clinical isolates were included from patients with invasive fusariosis involving lungs, sinuses, or both. Clinico-radiological data were collected. Samples were processed by standard laboratory procedures. Three gene regions (ITS, TEF1, and RPB2) were amplified by PCR for multilocus sequencing. Fusarium MLST, FUSARIUM-ID, and FUSARIOID-ID databases were used for final identification. Antifungal susceptibility testing was performed by broth microdilution following CLSI M38-A3 and Sensititre™ YeastOne™ YO9 plate. Pulmonary involvement was seen in all patients, and sino-nasal involvement was present in six. Radiologically, consolidations and cavitations were present in eight and six cases, respectively. Halo sign was present in six; reverse halo sign was also found in three of them. Direct microscopy showed septate hyphae that were morphologically different from those found in aspergillosis. Results of the molecular identification were as follows: two *Fusarium irregulare, one Fusarium pernambucanum*, one *Fusarium incarnatum*, one Fusarium sp. FIESC 30, two *Fusarium keratoplasticum*, one *Fusarium falciforme*, one *Fusarium pseudonygamai*, and one *Fusarium delphinoides*. For both *Fusarium solani* (FSSC) and *Fusarium incarnatum-equiseti* (FIESC) species complexes, amphotericin B had the lowest minimum inhibitory concentrations (MICs). Importantly, for terbinafine, all FIESC isolates had low MICs, while FSSC isolates had high MICs. In some cases, early identification of Fusarium spp. is possible by means of morphology of hyphae on direct microscopy and findings on radiology. Molecular identification, at least to the species complex level, is crucial for the choice of antifungals.

PMID: 39504490

24. **A clinical study of rhino-orbital-cerebral mucormycosis during the COVID-19 pandemic in western Maharashtra**

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Department of Ophthalmology, Dr. D.Y. Patil Medical College and Hospital, Pimpri, Pune, Maharashtra, India.

J Family Med Prim Care. 2024 Sep;13(9):3730-3734. doi: 10.4103/jfmpc.jfmpc_2_24. Epub 2024 Sep 11.

Abstract

Background: The aim of the study was to describe the epidemiology and study the risk factors, clinical presentation, management, and outcome of rhino-orbital-cerebral mucormycosis (ROCM) in terms of mortality, exenteration, eye salvage, and vision salvage.

Methods: This retrospective, observational study was carried out over a period of two months. A detailed history was noted, and an ophthalmological examination was done. The diagnosis was done by Potassium hydroxide (KOH) mount and fungal culture. Magnetic resonance imaging (MRI) of the orbit, brain, and paranasal sinuses were performed. Medical (intravenous amphotericin B, posaconazole), surgical (retrobulbar amphotericin B injection, exenteration, Functional Endoscopic Sinus Surgery (FESS)), or combined management was evaluated, and clinical outcomes was noted.

Results: The mean age of patients was 54.2 years and the male-to-female ratio was 1.77/1. The most common underlying risk factor for ROCM was uncontrolled diabetes mellitus (70%), followed by the use of corticosteroids for the management of coronavirus disease 2019 (COVID-19) infection in 68% of patients. The most common clinical presentation was diminution of vision followed by eschar, ptosis, and proptosis. Medical and FESS were done in all patients; exenteration was done in 12% of patients. Sixty-six percent of patients were alive with regression of ROCM, 20% of patients were alive with residual, 8% of patients were alive with the progression of ROCM, and 6% of patients had expired. Among the ones who are alive, the ocular outcome was orbital exenteration in 12.76%, the eye was salvaged in 25.53 and vision salvage was achieved in 61.70%.

Conclusion: ROCM affects older males. Immunosuppression due to COVID-19 infection, diabetes mellitus, and corticosteroid use in the management of COVID-19 are the main risk factors for the development of ROCM. Antifungal therapy along with surgical debridement decreases mortality.

Keywords: Amphotericin B; COVID-19; exenteration; posaconazole; rhino-orbital-cerebral mucormycosis; vision salvage.

PMCID: PMC11504763

25. **Antifungal Efficacy of Ultrashort β-Peptides against *Candida* Species: Mechanistic Understanding and Therapeutic Implications**

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ACS Infect Dis. 2024 Nov 8;10(11):3736-3743. doi: 10.1021/acsinfecdis.4c00476. Epub 2024 Oct 11.

Abstract

Candidiasis, a condition spurred by the unchecked proliferation of *Candida* species, poses a formidable global health threat, particularly in immunocompromised individuals. The emergence of drug-resistant strains complicates management strategies, necessitating novel therapeutic avenues. Antimicrobial peptides (AMPs) have garnered attention for their potent antifungal properties and broad-spectrum activity against *Candida* species. This study assessed the antifungal effectiveness of ultrashort β-peptides against *Candida* strains, with a specific focus on peptide P3 (LAU-β-3,3Pip-β-2,2Ac6c-PEA). Our findings showed P3›s remarkable fungistatic and fungicidal activities against *Candida albicans*, exhibiting an MIC of 4 μg/mL, comparable to those of standard antifungal drugs. The MIC value remained unchanged in the presence of ADC and BSA, indicating that serum albumin does not

diminish the activity of P3. P3 demonstrates synergistic effects when combined with Fluconazole (FLU), Itraconazole (ITR), and Nystatin (NYS) to the extent that it becomes effective at 0.125, 0.125, and 0.03125 µg/mL, respectively. Concentration versus time-kill kinetics showed its time-dependent activity up to the first 12 h against *C. albicans*, and later concentration also played a role; indeed, at 24 h the whole culture was sterilized at 8× MIC. Post-antifungal effect assays confirmed prolonged suppression of pathogen growth after the removal of P3 from the media for significant durations. More importantly, P3 inhibits hyphae formation and biofilm development of *Candida*, outperforming Fluconazole with respect to these properties. Mechanistic insights display P3's potential to disrupt fungal cell membrane integrity and dose-dependent inhibition of ergosterol biosynthesis, essential for fungal cell wall integrity. Using the Bradford assay, it was observed that extracellular protein concentrations increased with higher doses of the compound, thereby validating the effect of P3 on membrane integrity. A comparative gene analysis using RT-PCR showed that P3 downregulates ERG3, ERG11, and HWP1, which are crucial for the survival and pathogenicity of *C. albicans*. The impact of P3 on ERG11 and ERG3 is more effective than that of Fluconazole. Molecular docking studies revealed strong binding of P3 to various isoforms of lanosterol 14-α-demethylase, a key enzyme in ergosterol synthesis. Furthermore, molecular dynamic simulations validated the stability of the most promising docking complex. Overall, our findings underscore P3's potential as a leading candidate for the development of innovative antifungal therapies, warranting further investigation and optimization.

PMID: 39392829

26. **The ER-Resident Ras Inhibitor 1 (Eri1) of *Candida albicans* Inhibits Hyphal Morphogenesis via the Ras-Independent cAMP-PKA Pathway**

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ACS Infect Dis. 2024 Oct 11;10(10):3528-3543. doi: 10.1021/acsinfecdis.4c00175. Epub 2024 Aug 9.

Abstract

Ras signaling and glycosylphosphatidylinositol (GPI) biosynthesis are mutually inhibitory in *S. cerevisiae* (Sc). The inhibition is mediated via an interaction of yeast Ras2 with the Eri1 subunit of its GPI-*N*-acetylglucosaminyl transferase (GPI-GnT), the enzyme catalyzing the very first GPI biosynthetic step. In contrast, Ras signaling and GPI biosynthesis in *C. albicans* (Ca) are mutually activated and together control the virulence traits of the human fungal pathogen. What might be the role of Eri1 in this pathogen? The present manuscript addresses this question while simultaneously characterizing the cellular role of CaEri1. It is either nonessential or required at very low levels for cell viability in *C. albicans*. Severe depletion of CaEri1 results in reduced GPI biosynthesis and cell wall defects. It also produces hyperfilamentation phenotypes in Spider medium as well as in bicarbonate medium containing 5% CO_2, suggesting that both the Ras-dependent and Ras-independent cAMP-PKA pathways for hyphal morphogenesis are activated in these cells. Pull-down and acceptor-photobleaching FRET experiments suggest that CaEri1 does not directly interact with CaRas1 but does so through CaGpi2, another GPI-GnT subunit. We showed previously that CaGpi2 is downstream of CaEri1 in cross talk with CaRas1 and for Ras-dependent hyphal morphogenesis. Here we show that CaEri1 is downstream of all GPI-GnT subunits in inhibiting Ras-independent filamentation. *CaERI1* also participates in intersubunit transcriptional cross talk within the GPI-GnT, a feature unique to *C. albicans*. Virulence studies using *G. mellonella* larvae show that a heterozygous strain of *CaERI1* is better cleared by the host and is attenuated in virulence.
hyperfilamentation.

PMID: 39119676

27. **Bronchiectasis Severity Index and FACED scores in patients with allergic bronchopulmonary aspergillosis complicating asthma: do they correlate with immunological severity or high-attenuation mucus?**

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J Asthma. 2024 Oct;1247-1242:(10)61. doi: 02770903.2024.2334901/10.1080. Epub 2024 Mar 28.

Abstract

Background: The utility of two disease-severity indices, namely bronchiectasis severity index (BSI) and FACED score in allergic bronchopulmonary aspergillosis (ABPA) remains unknown.

Objective: To correlate the BSI and FACED scores with immunological parameters (serum IgE [total and *A. fumigatus*-specific], *A. fumigatus*-specific IgG, blood eosinophil count), and high-attenuation mucus on chest computed tomography in ABPA. The secondary objectives were to evaluate the correlation between BSI and FACED scores and correlate the BSI/FACED scores with the bronchiectasis health questionnaire (BHQ) and Saint George's Respiratory Questionnaire (SGRQ).

Methods: We included treatment-naïve ABPA subjects with bronchiectasis in a prospective observational study. We computed the BSI and FACED scores for each subject before initiating treatment. The subjects also completed two quality-of-life questionnaires (BHQ and SGRQ).

Results: We included 91 subjects. The mean (standard deviation) BSI and FACED scores were 3.43 (3.39) and 1.43 (1.27). We found no correlation between BSI or FACED with any immunological parameter or high-attenuation mucus. There was a strong correlation between BSI and FACED scores ($r = 0.76$, $p < 0.001$). We found a weak correlation between BSI and BHQ/SGRQ and FACED and SGRQ.

Conclusion: We found no correlation between BSI and FACED with immunological parameters in ABPA. However, we found a significant correlation between BSI and FACED and a weak correlation between SGRQ and BHQ. ABPA likely requires a separate disease-severity scoring system.

PMID: 38520686

28. **The Outcome of Endoscopic Sinus Surgery for Orbital Apex Syndrome Secondary to Sinusitis in a Tertiary Care Center-Our Experience Over 10 Years**

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Turk Arch Otorhinolaryngol. 2024 Jul 3;62(1):7-13. doi: 10.4274/tao.2024.2023-12-10.

Abstract

Objective: Orbital apex syndrome (OAS) is a rare condition with

multiple cranial nerve involvement caused by varied etiologies. It is not only a threat to the patient's vision but also life-threatening due to the intracranial spread of infection, if not diagnosed early and treated accurately. To study the outcome of endoscopic sinus surgery (ESS) for OAS secondary to sinusitis concerning resolution of ptosis, improvement of ophthalmoplegia, visual prognosis, intracranial spread of infection, and mortality.

Methods: A retrospective review of patients with OAS secondary to sinusitis who underwent ESS from 2011 to 2021 was tabulated and analyzed.

Results: Twenty-seven patients (mean age: 55.11+/-16 years; male 62%) were included in this study. At presentation, blurring of vision (81%), headache (66%), diplopia (63%) ptosis (63%) were the most common symptoms, and ophthalmoplegia (100%) was the most common sign. Five patients had no perception of light and the rest had various degrees of vision impairment. The most common etiopathology of sinusitis was fungal sinusitis (12 mucormycosis and four aspergillus). The final visual prognosis at three months follow-up post-ESS showed vision stabilization (no improvement or worsening) in 13 (48%) patients, improvement in seven (26%) patients, and vision deterioration in two (7%) patients. There was a significant improvement in ptosis (70%) and ophthalmoplegia (85%). There was no intracranial spread of infection or recurrence with a mortality rate of 3.7% (one patient).

Conclusion: ESS coupled with appropriate antimicrobials effectively treats OAS secondary to sinusitis with decreased morbidity and mortality.

PMID: 39257036

29. **Critical roles of Dpb3-Dpb4 sub-complex of DNA polymerase epsilon in DNA replication, genome stability, and pathogenesis of *Candida albicans***

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mBio. 2024 Oct 10)15;16):e0122724. doi: 10.1128/mbio.-01227 24. Epub 2024 Aug 29.

Abstract

DNA polymerase ε (Polε) is an essential replicative polymerase consisting of Pol2, Dpb2, Dpb3, and Dpb4 subunits and has not been explored in the pathogenic yeast *Candida albicans. C. albicans* is accountable for >%40 of deaths due to systemic candidiasis per year worldwide. Genome plasticity is one of the adaptive mechanisms associated with virulence, and as it is associated with DNA polymerase function, this study explored the role of Polε in genome stability and pathogenesis of *C.albicans. POL2* and *DPB2* are haploinsufficient, but *DPB3* and *DPB4* are dispensable for cell survival in diploid *C. albicans*. However, unlike in *Saccharomyces cerevisiae*, loss of any or both of the nonessential subunits or defective interaction between the two resulted in slow growth and temperature-sensitive phenotypes. Knockout strains of *C. albicans* (*dpb3*ΔΔ and *dpb4*ΔΔ and *dpb3*ΔΔ*dpb4*ΔΔ) also exhibited sensitivity to genotoxic agents and delayed cell cycle progression. Reduced processive DNA synthesis and increased rate of mutagenesis were observed in *dpb3* and *dpb4* null strains. Whole-genome sequencing further confirmed the accumulation of indels and SNPs majorly in the intergenic repeat regions of the chromosomes of *dpb3*ΔΔ*dpb4*ΔΔ. Polε-defective strains were constitutively filamentous and non-pathogenic in mice models of systemic candidiasis. Altogether, this study showed that the function of the Dpb-3Dpb4 subcomplex is critical for fungal morphogenesis and virulence besides its role as a structural component of Polε in DNA replication and genome stability; thus, their interacting interface may be targeted to develop antifungal drugs.

Importance: This study explored the role of DNA polymerase epsilon, especially its non-essential structural subunits in *Candida albicans* biology. Apart from their role in DNA replication and genome stability, the Dpb-3Dpb4 subcomplex regulates morphological switching and virulence. Since the defective strain is locked in filamentous form and is avirulent, the complex may be targeted for anti-fungal drug development.

PMID: 39207097

30. **Mining for antifungal agents to inhibit biofilm formation of *Candida albicans*: A study on green synthesis, antibiofilm, cytotoxicity, and in silico ADME analysis of 2-amino-4H-pyran-3-carbonitrile derivatives**

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Microb Pathog. 2024 Nov:196:106926. doi: 10.1016/j. micpath.2024.106926. Epub 2024 Sep 11.

Abstract

Candida albicans (*C. albicans*) biofilm infections are quite difficult to manage due to their resistance against conventional antifungal drugs. To address this issue, there is a desperate need for new therapeutic drugs. In the present study, a green and efficient protocol has been developed for the synthesis of 2-amino-4H-pyran-3-carbonitrile scaffolds 4a-i, 6a-j, and 8a-g by Knoevenagel-Michael-cyclocondensation reaction between aldehydes, malononitrile, and diverse enolizable C-H activated acidic compounds using guanidinium carbonate as a catalyst either under grinding conditions or by stirring at room temperature. This protocol is operationally simple, rapid, inexpensive, has easy workup and column-free purification. A further investigation of the synthesized compounds was conducted to examine their antifungal potential and their ability to inhibit the growth and development of biofilm-forming yeasts like fungus *C. albicans*. According to our findings, 4b, 4d, 4e, 6e, 6f, 6g, 6i, 8c, 8d, and 8g were found to be active and potential inhibitors for biofilm infection causing *C. albicans*. The inhibition of biofilm by active compounds were observed using field emission scanning electron microscopy (FESEM). Biofilm inhibiting compounds were also tested for in vitro toxicity by using 3T3-L1 cell line, and 4b, 6e, 6f, 6g, 6i, 8c, and 8d were found to be biocompatible. Furthermore, the in silico ADME descriptors revealed drug-like properties with no violation of Lipinski's rule of five. Hence, the result suggested that synthesized derivatives could serve as a useful aid in the development of novel antifungal compounds for the treatment of fungal infections and virulence in *C. albicans*.

PMID: 39270755

31. **Clinical Significance of *Aspergillus* Sensitisation in Chronic Pulmonary Aspergillosis**

Inderpaul Singh Sehgal [1], Sahajal Dhooria [1], Valliappan Muthu [1], Kathirvel Soundappan [2], Kuruswamy Thurai Prasad [1], Mandeep Garg[3], Shiva Prakash Rudramurthy[4], Ashutosh Nath Aggarwal[1], Arunaloke Chakrabarti[5], Ritesh Agarwal[1]

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Mycoses. 2024 Dec;12)67):e70002. doi: 10.1111/myc.70002.

Abstract

Objective: *Aspergillus* sensitisation (AS) is seen in many patients with chronic pulmonary aspergillosis (CPA). However, the clinical relevance of AS in CPA remains unclear. In this study, we assess the clinical significance of AS in CPA.

Methods: We retrospectively analysed the data of CPA subjects, defining AS as *Aspergillus fumigatus* -IgE ≥ 0.35 kUA/L. We excluded subjects with asthma, allergic bronchopulmonary aspergillosis, chronic obstructive pulmonary disease (COPD) and diffuse parenchymal lung diseases (DPLD). The primary objective was to compare the demographic and clinical characteristics, lung functions (via spirometry) and treatment outcomes in CPA subjects with or without AS. The secondary objective was to explore the association between AS and airflow obstruction on spirometry using multivariable logistic regression analysis.

Results: We included 232 CPA subjects (119 females, 113 males) with a mean ± SD age of 42.1 ± 13.7 years. AS was present in 92 (39.7%) CPA patients (CPA-AS group). CPA-AS patients had higher SGRQ total scores, a higher prevalence of fungal ball, more frequent airflow obstruction and experienced more CPA relapses during follow-up compared to those without AS. Airflow obstruction was seen in 77/232 (33.2%) CPA patients. On multivariable logistic regression analysis, we found AS, increasing age and chronic fibrosing pulmonary aspergillosis independently associated with airflow obstruction on spirometry after adjusting for sex and other CPA categories. The relapse-free survival was significantly shorter in the CPA-AS group than in the CPA group.

Conclusion: AS is common in CPA and is independently associated with airflow obstruction. More studies are required to confirm our findings.

PMID: 39613720

32. **Prolonged treatment of dermatophytosis caused by *Trichophyton indotinea* with terbinafine or itraconazole impacts better outcomes irrespective of mutation in the squalene epoxidase gene**

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Mycoses. 2024 Aug;67(8):e13778. doi: 10.1111/myc.13778.

Abstract

Background: Over the past decades, the increasing incidence of recurrent dermatophytosis associated with terbinafine-resistant Trichophyton has posed a serious challenge in management of dermatophytosis. Independent reports of failure of treatment and high minimum inhibitory concentrations (MIC) of antifungals are available, but data correlating MIC and clinical outcomes is still sparse. Therefore, the present study was conducted to evaluate the outcomes of systemic treatment of dermatophytosis and its correlation with MIC of the etiological agents isolated from such patients.

Methods: Retrospective analysis of 587 consecutive patients with dermatophytosis was done from March 2017 to March 2019. Demographic and clinical details of the patients were noted, along with the results of direct microscopy and fungal culture. The isolates were identified by sequencing the internal transcribed spacer region of rDNA. Antifungal susceptibility testing was performed following the CLSI M38 protocol. Mutation in the squalene epoxidase (SE) gene was detected by DNA sequencing and ARMS-PCR. Based on the culture-positivity and prescribed systemic antifungal, patients were categorised into Group I culture-positive cases treated with systemic terbinafine and Group II culture-positive cases treated with systemic itraconazole, each for a total period of 12 weeks.

Results: In the present study, 477 (81.39%) were culture-positive; however, 12 weeks follow-up was available for 294 patients (Group I-157 and Group II-137) who were included for statistical analysis. In both groups [Group I-37/63 (51.4%) and Group II-14/54 (58.3%)], a better cure rate was observed if the initiation of therapy was performed within <6 months of illness. Treatment outcome revealed that if therapy was extended for 8-12 weeks, the odds of cure rate are significantly better ($p < .001$) with either itraconazole (Odd Ratio-15.5) or terbinafine (Odd Ratio-4.34). Higher MICs for terbinafine were noted in 41 cases (cured-18 and uncured-23) in Group I and 39 cases (cured-16 and uncured-23) in Group II. From cured (Group I-17/18; 94.4% and Group II-14/16; 87.5%) and uncured (Group I-20/23; 86.9% and Group II-21/23; 91.3%) cases had F397L mutation in the SE gene. No significant difference in cure rate was observed in patients with Trichophyton spp. having terbinafine MIC ≥ 1or <1 µg/mL (Group I-p = .712 and Group II-p = .69).

Conclusion: This study revealed that prolonging terbinafine or itraconazole therapy for beyond 8 weeks rather than the standard 4 weeks significantly increases the cure rate. Moreover, no correlation has been observed between antifungal susceptibility and clinical outcomes. The MIC remains the primary parameter for defining antifungal activity and predicting the potency of antifungal agents against specific fungi. However, predicting therapeutic success based solely on the MIC of a fungal strain is not always reliable, as studies have shown a poor correlation between in vitro data and in vivo outcomes. To address this issue, further correlation of antifungal susceptibility testing (AFST) data with clinical outcomes and therapeutic drug monitoring is needed. It also highlights that initiation of the treatment within <6 months of illness increases cure rates and reduces recurrence. Extensive research is warranted to establish a better treatment regime for dermatophytosis.

PMID: 39086026

33. **Clinical Evaluation of a Novel CRISPR-Cas12a-Based RID-MyC Assay for the Diagnosis of Fungal Endophthalmitis**

Hanith Raj Deivarajan[1], Prabhakara SethupathyR[1], Vignesh Elamurugan[2], Akshayaa Vs[3], Reega P[3], Dharani Chelliah[1], Hari Vignesh S[4], Elakkiya Nandhini Gr[5], Kanmani M[4], Dharsini N[1], Karvannan Sevugamurthi[1], Saravanan Vr[6], Anuradha K[7], Parag K Shah[6], Ram Rammohan[8], Abhishek Nair[5], Krutin Shah[5], Anju Jose[6], Jaishree Pandian[5], Lalitha Prajna[9], Venkatesh N Prajna[10], Siddharth Narendran[11]

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Ophthalmol Retina. 2024 Nov 8:S5-00533(24)6530-2468. doi: 10.1016/j.oret.2024.11.003.

Abstract

Objective: This study evaluates the RID-MyC (Rapid Identification of Mycoses using CRISPR) assay, a CRISPR/Cas12a-based diagnostic tool, for its efficacy in diagnosing fungal endophthalmitis (FE), comparing it with panfungal PCR and culture methods.

Design: A comparative cross-sectional study assessing the performance of the RID-MyC assay against established diagnostic modalities for FE.

Subjects: The study included 133 intraocular samples from 117 patients with suspected microbial endophthalmitis.

Methods: The study compared the sensitivity, specificity, positive predictive value (PPV), and negative predictive value (NPV) of the RID-MyC assay against panfungal PCR and culture. The Limit of Detection (LoD) for Aspergillus flavus and *Candida albicans* was determined for both RID-MyC and panfungal PCR across three different media: nuclease-free water (NFW), aqueous humor (AH), and vitreous humor (VH). Discrepancy analysis was conducted for discordant results, incorporating clinical outcomes and responses to antifungal treatment.

Main outcome measures: The study primarily assessed the sensitivity, specificity, PPV, and NPV for clinical samples. Time to diagnosis was also evaluated.

Results: The RID-MyC assay demonstrated a sensitivity of 88.24% (CI: 63.56% to 98.54%) and specificity of 93.1% (CI: 86.86% to 96.98%), with PPV and NPV of 65.22% (CI: 48.45% to 78.91%) and 98.18% (CI: 93.62% to 99.50%), respectively. Discrepancy analysis enhanced sensitivity to 90.48% (CI: 69.62% to 98.83%) and specificity to 96.43% (CI: 91.11% to 99.02%). The RID-MyC assay was 10 to 1000-fold more sensitive than panfungal PCR in detecting Aspergillus flavus and *Candida albicans* in intraocular specimens. The time to diagnosis with the RID-MyC assay was consistently under two hours.

Conclusions: The RID-MyC assay may advance the rapid and precise diagnosis of FE, with possible relevance to other invasive fungal conditions.

PMID: 39522754

34. **Clinico-mycological validation of dermatophytosis severity score and its correlation with patient-reported outcome measures**

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Mycoses. 2024 Aug;67(8):e13783. doi: 10.1111/myc.13783.

Abstract

Background: Dermatophytosis impacts a significant portion of the global population. Recent shifts in the disease's presentation, severity and response to treatment, primarily due to emerging drug resistance, underscore the need for reliable assessment tools. The Dermatophytosis Severity Score (DSS) aims to standardise the evaluation of the disease's severity and monitor therapeutic responses.

Methods: In a cross-sectional pilot study, 25 adults with clinically diagnosed dermatophytosis were evaluated using the DSS. The study also aimed to establish the correlation of DSS with different stages of treatment, dermatophyte species and patient-reported outcomes. Participants were recruited from a dermatology outpatient clinic, and the DSS was applied at baseline, Weeks 4 and 8. The validity and reliability of the DSS were assessed using statistical measures, including Cronbach's alpha and intraclass correlation coefficient.

Results: The study comprised of a near-equal distribution of male (52%) and female (48%) patients, primarily within the age group of 20-39 years. A high recurrence rate of dermatophytosis (60%) was noted, and more than half of the patients (56%) had used topical steroids before presentation. The mean DSS significantly decreased from baseline to the final visit, mirroring the substantial reduction in the 5D itch scale and Dermatology Life Quality Index, with strong positive correlations observed between these measures.

Conclusion: The DSS demonstrated high inter-rater reliability and internal consistency, indicating its utility as a reliable clinical tool for assessing dermatophytosis severity. The strong correlation of DSS with itch intensity and quality of life validates its role in patient-centered care. Continued use and further validation of the DSS are recommended to enhance dermatophytosis management and treatment outcomes.

PMID: 39135217

35. **Population prevalence of aspergillus sensitization and allergic bronchopulmonary aspergillosis in COPD subjects in North India**

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Mycoses. 2024 Aug;8)67):e13784. doi: 10.1111/myc.13784.

Abstract

Background: Sensitization to *Aspergillus fumigatus* (AS) has been recently described in chronic obstructive pulmonary disease (COPD) patients. However, there is no data on the community prevalence of AS in COPD.

Objectives: To assess the prevalence of AS among COPD subjects. The secondary objectives were to (1) assess the prevalence of allergic

bronchopulmonary aspergillosis (ABPA) in COPD and (2) compare the lung function in COPD subjects with and without AS.

Methods: We conducted a cross-sectional study in rural (29 villages) and urban (20 wards) communities in North India. We identified individuals with respiratory symptoms (IRS) through a house-to-house survey using a modified IUATLD questionnaire. We then diagnosed COPD through specialist assessment and spirometry using the GOLD criteria. We assayed *A.fumigatus*-specific IgE in COPD subjects. In those with *A. fumigatus*-specific IgE ≥0.35 kUA/L (AS), ABPA was diagnosed with raised serum total IgE and raised *A.fumigatus*-specific IgG or blood eosinophil count.

Results: We found 1315 (8.2%) IRS among 16,071 participants >40 years and diagnosed COPD in 355 (2.2%) subjects. 291 (82.0%) were men and 259 (73.0%) resided in rural areas. The prevalence of AS and ABPA was 17.7% (95% CI, 13.9-21.8) and 6.6% (95% CI, 4.4-8.8). We found a lower percentage predicted FEV1 in COPD subjects with AS than those without (p =.042).

Conclusions: We found an 18% community prevalence of AS in COPD subjects in a specific area in North India. Studies from different geographical areas are required to confirm our findings. The impact of AS and ABPA on COPD requires further research.

Keywords: COPD; abpm; aspergillosis; *Aspergillus fumigatus* ; bronchiectasis.

PMID: 39123291

36. **MIG1, TUP1 and NRG1 mediated yeast to hyphal morphogenesis inhibition in *Candida albicans* by ganciclovir**

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Braz J Microbiol. 2024 Sep;2056-2047:(3)55. doi: 10.1007/s-42770 8-01344-024. Epub 2024 May 24.

Abstract

Candida albicans is a polymorphic human fungal pathogen and the prime etiological agent responsible for candidiasis. The main two aspects of *C. albicans* virulence that have been suggested are yeast-to-hyphal (Y-H) morphological transitions and biofilm development. Anti-fungal agents targeting these virulence attributes enhances the antifungal drug development process. Repositioning with other non-fungal drugs offered a one of the new strategies and a potential alternative option to counter the urgent need for antifungal drug development. In the current study, an antiviral drug ganciclovir was screened as an antifungal agent against ATCC 90028, 10231 and clinical isolate (C1). Ganciclovir at 0.5 mg/ml concentration reduced 50% hyphal development on a silicon-based urinary catheter and was visualized using scanning electron microscopy. Ganciclovir reduced ergosterol biosynthesis in both strains and C1 isolate of *C. albicans* in a concentration-dependent manner. Additionally, a gene expression profile study showed that ganciclovir treatment resulted in upregulation of hyphal-specific repressors MIG1, TUP1, and NRG1 in *C. albicans*. Additionally, an in vivo study on the Bombyx mori silkworm model further evidenced the virulence inhibitory ability of ganciclovir (0.5 mg/ml) against *C. albicans*. This is the first report that explore the novel anti-morphogenic activities of ganciclovir against the pathogenic *C. albicans* strains, along with clinical isolates. Further, ganciclovir may be considered for therapeutic purpose after combinations with standard antifungal agents.

PMID: 38789908

37. ***In vitro* evaluation of antifungal combinations against neurotropic dematiaceous fungi associated with primary cerebral phaeohyphomycosis**

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Microbiol Spectr. 2024 Aug 8)12;6):e0078124. doi: 10.1128/ spectrum.24-00781. Epub 2024 Jun 26.

Abstract

Primary cerebral phaeohyphomycosis is a life-threatening disease caused by neurotropic dematiaceous fungi. At present, there are no consensus guidelines regarding optimal antifungal therapy in such cases. Generally, a combination of antifungal agents is recommended for treatment. However, the activities of antifungal combinations against these fungi have not been investigated. In this study, we evaluated the *in vitro* activities of 13 double and five triple antifungal combinations against clinical isolates of *Cladophialophora bantiana* (*n* = 7), *Fonsecaea monophora* (*n* = 2), and *Cladosporium cladosporioides* (*n* = 1), using a simplified checkerboard procedure. The minimum inhibitory concentrations (MICs) of nine antifungal drugs were determined by the broth microdilution method, and the interaction between antifungal agents in each combination was assessed by the fractional inhibitory concentration index. Excellent activity was observed for posaconazole and itraconazole. Flucytosine had potent activity against *C. bantiana* but was ineffective against *F. monophora*, and *C. cladosporioides*. The echinocandins demonstrated high MICs for all the isolates. Synergistic interactions were observed for all the double combinations, except when itraconazole was combined with either amphotericin B or flucytosine. The combination of amphotericin B with caspofungin showed synergistic interactions against 40% of the isolates. Antagonism was observed with isavuconazole-flucytosine combination against two *C. bantiana* isolates. The triple combinations of caspofungin and flucytosine with amphotericin B or posaconazole were synergistic against one isolate of *F. monophora*. For *C. cladosporioides*, synergy was observed for the triple combination of amphotericin B with caspofungin and flucytosine. Our results indicate that combination of caspofungin with amphotericin B or a triazole, with or without 5-flucytosine has great potential against neurotropic dematiaceous fungi. This research uses a modified version of the checkerboard assay to standardize the *in vitro* testing of double and triple combinations of antifungal agents against neurotropic dematiaceous fungi. Antifungal combination therapy is associated with improved outcomes in cerebral phaeohyphomycosis. In this study, we demonstrate that

posaconazole is the single most active antifungal drug against this group of fungi. The double combination of amphotericin B with caspofungin or a trizole, and the triple combinations of caspofungin and flucytosine with amphotericin B or posaconazole might hold promise in the treatment of cerebral phaeohyphomycosis. Our findings will guide in developing optimal therapeutic strategies for these refractory infections.

PMID: 38920376

38. **Tinea capitis caused by Microsporum canis: A case study of three family members in India, a non-endemic region**

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Case Report. Indian J Med Microbiol. 2024 Jul-Aug;50:100621. doi: 10.1016/j.ijmmb.2024.100621. Epub 2024 Jun 23. DOI: 10.1016/j.ijmmb.2024.100621

Abstract

Introduction: Tinea capitis, a common scalp infection primarily affecting children, is caused by keratinophilic dermatophytic fungi, notably Microsporum and Trichophyton species. Microsporum canis, primarily transmitted from cats and dogs to humans, is rarely reported in non-endemic regions like India. We report a cases involving three family members from Delhi, India, diagnosed with tinea capitis caused by Microsporum canis. The index case, a five-year-old boy, contracted the infection through contact with a cat, while his younger brother and sister acquired it through human-to-human transmission within the family.

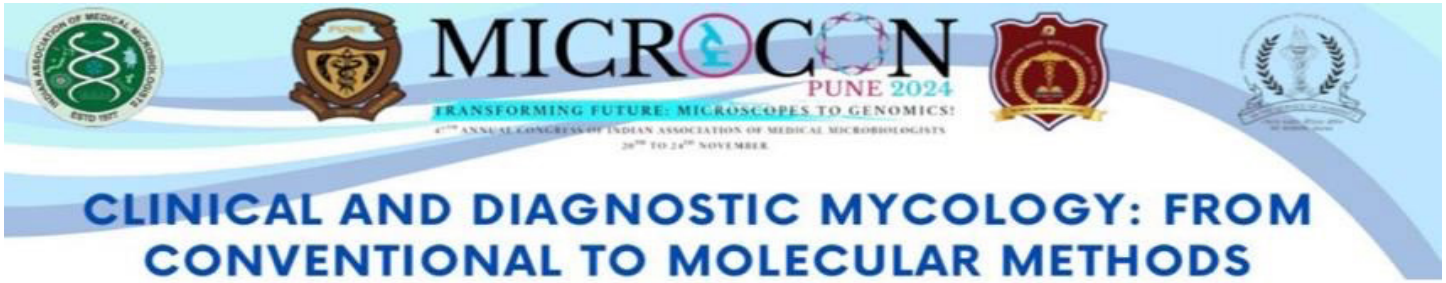
Methods: Clinical examination, microscopic analysis, and molecular identification techniques confirmed the diagnosis. Antifungal susceptibility testing revealed sensitivity to itraconazole and terbinafine but resistance to griseofulvin.

Results: Treatment with oral terbinafine and topical ketoconazole cream led to successful outcomes for all three patients. Molecular typing confirmed clonality of the isolates, indicating human-to-human transmission.

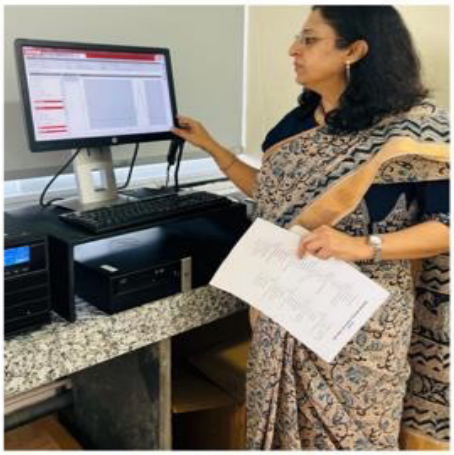
Conclusion: This case study underscores the significance of considering atypical sources of infection and human-to-human transmission in the diagnosis and management of tinea capitis caused by Microsporum canis in non-endemic regions. It emphasizes the necessity of thorough contact history assessment and appropriate antifungal therapy for effective control of the infection.

PMID: 38885904

I. Dr. Malini Kapoor organised a Pre-Conference workshop: WS2: Diagnostic and Clinical Mycology: Coventional to Molecular methods: 21 Nov 2024 under MICROCON-2024, 47th Annual Congress of Indian Association of Medical Microbiologists, BJMC, Pune from 22nd to 24th November 2024: delegates from various states









2. Dr. Shukla Das organised a Continuous Medical Education (CME) Program entitled "Confronting AMR: Innovations and Strategies in Fungal Infection Management" on September 5, 2024 at India Habitat Centre, New Delhi. The primary organisation was done by the Department of Microbiology, University College of Medical Sciences (UCMS), Delhi in collaboration with WHO Country Office, India, represented by Dr. Anuj Sharma (Focal Point - AMR and IPC Team). The CME was designed for a diverse group of healthcare professionals including, mycologists, infectious disease specialists, critical care physicians, intensivists, general practitioners, researchers and academicians in related fields.

Other Academic Partners:

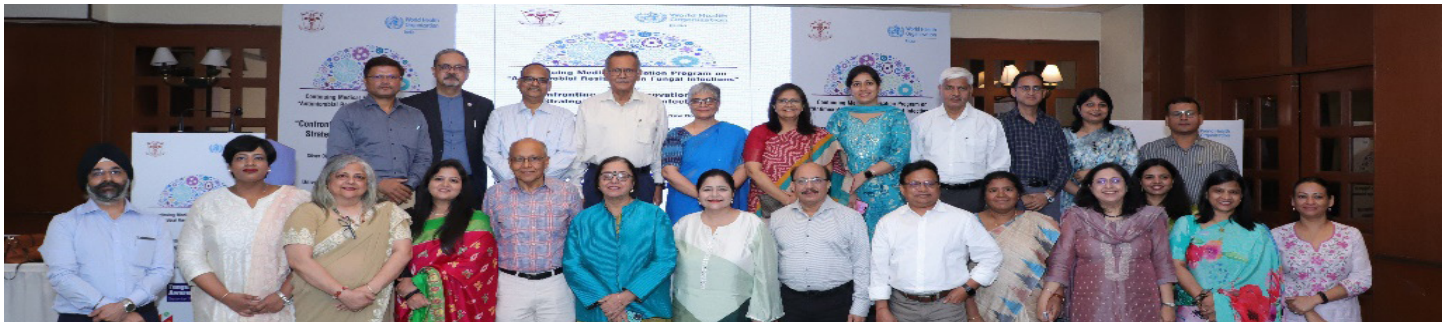
1. **Indian Society of Medical Mycologists**
   - Dr. Jayanthi Savio, Dr. Anup Ghosh, Dr. Pratibha Kale
2. **Clinical Infectious Disease Society (Haryana and UP Chapter)**

Program Schedule and Content

This comprehensive CME program focused on various aspects of fungal infections and their management. The day commenced with an update on Cryptococcal infections, covering recent epidemiological trends, diagnostic advancements, and current treatment protocols, particularly relevant for immunocompromised patients. This was followed by an engaging debate between Dr. Amber and Dr. Anivita on empirical versus pre-emptive antifungal therapy, exploring their respective merits and implications for antimicrobial stewardship. Dr. Harsimran Kaur then presented cutting-edge molecular diagnostics for fungal infections, while Dr. Shivaprakash provided a detailed overview of antifungal resistance patterns in India.

The midday sessions featured Dr. Arunaloke Chakrabarti discussing emerging fungal diseases in Asia, followed by two WHO representatives - Dr. Anuj Sharma addressing fungal AMR surveillance and Dr. Hatim Sati introducing the WHO fungal priority pathogen list. Dr. Animesh Ray from AIIMS then led a crucial session on distinguishing between fungal colonization and true infection in the respiratory tract.

The afternoon program began with a multidisciplinary panel discussion moderated by Dr. Pratibha Kale, addressing strategies to combat increasing antifungal resistance. Dr. Aparna Chakrabarti then presented a specialized session on neonatal candidemia, covering specific challenges and treatments for newborns. The CME concluded with interactive case-based discussions focusing on managing invasive *Candida* infections and fungal infections in immunocompromised patients, providing practical insights into diagnostic approaches and treatment decision-making.



3. Dr. Ragini Tilak organised a "National level Diagnostic Mycology workshop at IMS BHU Varanasi".

   The 3-days National workshop & Hands-on training on diagnostic Mycology was organized by the Department of Microbiology, Institute of Medical Sciences, Banaras Hindu University from 3rd- 5thOctober2024. The workshop engaged the participants in first hand experience on clinical presentation of human fungal pathogens, their laboratory diagnosis and determination of antifungal susceptibility testing. The organizing committee comprised of Prof Ragini Tilak, Prof Munesh Kumar Gupta and Dr. Bitan Naik from IMS, BHU with renowned mycologists Prof. Malini R. Capoor, VMMC and Safdarjung Hospital, New Delhi and Prof. Rungmei SK Marak, SGPGI Lucknow as the external resource person.

   Thirty-five participants from across the country were trained on sample processing and identification of fungal pathogens in clinical samples using basic techniques like KOH mount and calcofluor white mount. The participants also learnt the basics of fungal culture and isolation techniques as well as conventional phenotypic identification like LPCB mount and Dalmau culture. Additionally, keeping in pace with the increasing demand for organism specific antimicrobial therapy, the participants got hands-on training in antifungal susceptibility testing so that appropriate antifungals can be suggested to the treating clinicians. The participants also learnt about non-culture based techniques like antigen testing and basics of molecular testing including their interpretation emphasizing on their key role in the early diagnosis of fungal infections.

ISMM's Fungal Disease Awareness Week 2024: Promoting Indian Medical Mycology Through Expert Insights

Dr. Vinaykumar Hallur, AIIMS, Bhubaneswar

The Indian Society of Medical Mycology successfully hosted online webinar from 16 September 2024 to 20 September 2024 for observing the Fungal Disease Awareness Week. The programme spread over 5 days was attended by more than 200 delegates per day. Leading Indian Medical Mycology Experts discussed important advancements in fungal illnesses, diagnosis, and treatments during the extensive program as summarised below.

Day 1: Testing and Antifungals

The inaugural talk of the webinar series was given by Prof. Arunaloke Chakrabarti who examined the WHO's priority fungal pathogens. While, Dr. Arghadip Samaddar spoke about managing endemic fungal infections, and Dr. Malini Capoor gave a presentation on biomarker interpretation in fungal diagnoses. The final talk of the day was given by Dr. Harsimran Kaur who shared her knowledge on new antifungal treatments.

Day 2: Fungal Diseases and one health.

The second day started with Dr. Shukla Das providing updates on cryptococcosis followed by Dr. Anup Ghosh discussing recurrent vulvovaginal candidiasis. These talks were followed by a presentation by Dr. Anupma Jyoti Kindo who discussed antifungal resistance from a One Health standpoint. In subsequent presentation Dr. Immaculata Xess talked about recent updates on *Candida auris*.

Day 3: Important Issues in Mycology.

Antifungal stewardship was discussed by Dr. Gagandeep Singh, followed by talks on fungal endophthalmitis and dematiaceous ocular diseases by Dr. Joveeta Joseph and Dr. Karnika Saigal. The final talk of day three was chromoblastomycosis a neglected tropical disease which was delivered by Dr. Vinaykumar Hallur.

Day 4: Fungal pneumonias

Day four included discussions by Dr. Shivaprakash MR on azole-resistant aspergillosis and Dr. Jayanthi Savio on fungal infections in hematological malignancies. Dr. Pratibha Kale talked about chronic pulmonary aspergillosis, while Dr. Ritesh Agarwal gave a presentation on the most recent ABPA guidelines.

Day 5: The Future of Fungal Diseases

On the final day of the series Dr. Savitri Sharma addressed *Fusarium* keratitis, while Dr. Vijaylatha Rastogi discussed the effects of climate change on fungal infections. Dr. Anjali Shetty talked about new fungal pathogens and Dr. Priyadarshini A. Padaki wrapped up the series with updates on fungal nomenclature and its therapeutic consequences.

ISMM's commitment to improving medical mycology education and practice in India was exemplified by this extensive five-day workshop. The webinar series gave practitioners and researchers in the field vital information and insights through these expert-led events and cooperative discussions.

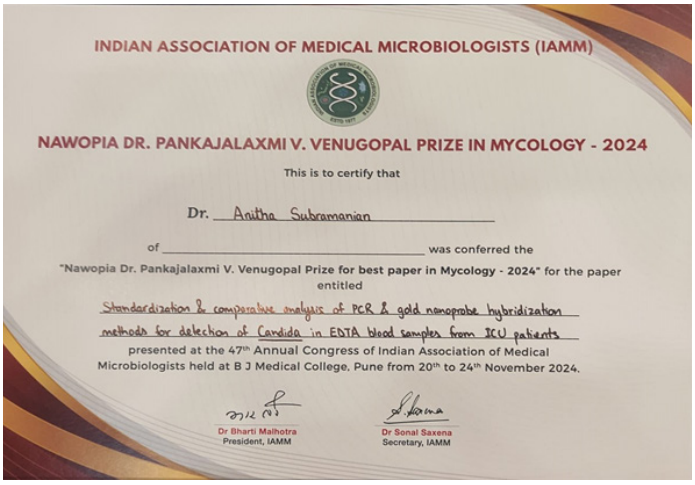
Department of Microbiology, Jawaharlal Nehru Medical College and associated hospitals, Ajmer (Raj.) under the chairmanship of Dr Vijaylatha Rastogi (PHOD), organized Fungal disease Awareness week from 16th-20th September, 2024. Various academic, IEC activities (Poster, Skit, Slogan writing), competitions (Quiz, Clay modelling) were conducted for medical students and HCW. A CME on "Fungal Diseases- Current Challenges & Future Perspectives" was conducted on 18th Sept, 2024 which was attended by 120 participants. The session began with interesting fungal clinical case presentations followed by Introductory talk on Current Scenario of Fungal Diseases by Dr V.L.Rastogi and Laboratory Diagnosis by Dr Pushpanjali. Antimicrobial Resistance in Fungi was apprised by Dr Vinay K Hallur followed by Fungal infection in diabetics by Dr Mayank Srivastava, Update on Cryptococcosis by Dr Prabhuprakash Gupta, Role of Histopathology by Dr Kalpana Sharma. Invasive Fungal Infections in ICU was discussed by Dr Parul Chaturvedi, Fungal infections of the eye by Dr Rakesh Porwal, Surgical management of fungal infections by Dr Ramprasad. This was followed by an interesting Panel Discussion on "Fungal Infections prevalent in Ajmer region- Diagnostic & Management Dilemmas" with renowned dermatologists, surgeons, clinicians, respiratory medicine and veterinary specialist as panelists. One health approach was advocated. A distinctive feature of this initiative was its unwavering commitment to eco-friendly practices.

Academic Partners:

ISMM- Dr Vinay K Hallur, IAMM-Rajasthan Chapter

Social Partner - Rotary Club Ajmer Midtown.

Accolades for ISMM members


INDIAN ASSOCIATION OF MEDICAL MICROBIOLOGISTS (IAMM)

NAWOPIA DR. PANKAJALAXMI V. VENUGOPAL PRIZE IN MYCOLOGY - 2024

This is to certify that

Dr. Anitha Subramanian

of _____ was conferred the

"Nawopia Dr. Pankajalaxmi V. Venugopal Prize for best paper in Mycology - 2024" for the paper entitled

Standardization & comparative analysis of PCR & gold nanoprobe hybridization methods for detection of Candida in EDTA blood samples from ICU patients

presented at the 47th Annual Congress of Indian Association of Medical Microbiologists held at B J Medical College, Pune from 20th to 24th November 2024.

Dr Bharti Malhotra
President, IAMM

Dr Sonal Saxena
Secretary, IAMM

INDIAN SOCIETY FOR MEDICAL MYCOLOGITS COUNCIL

REGIONAL MEMBER - NOMINATION and CONSENT FORM FOR 2025 – 27

Part A- Nomination Form

We, the members nominate,
Name [Upper Case]:
Affiliation:
ISMM Membership Number:
Contact Details:
Phone:
E-mail

POST	Tick as appropriate	
Member – East	Yes	NO
Member – West		
Member – North		
Member – South		
Member – Central		

Member - Primary Proposer		Member – Second the Nomination	
Name [Upper case]		Name [Upper case]	
Affiliation		Affiliation	
ISMM membership No		ISMM membership No	
Signature		Signature	
Date		Date	

Part B - CONSENT FORM

I,
Name [Upper Case]:
consent my nomination for the post of [Tick as appropriate]

POST	Tick as appropriate	
	Yes	NO
Member – East		
Member – West		
Member – North		
Member – South		
Member – Central		

and confirm the my details as follows.

Affiliation:
ISMM Membership Number:
Contact Details:
Phone:
E-mail

DATE **SIGNATURE**

Instructions:

- **Deadline:** Midnight of 15st February 2025
- Type the details in both the nomination and consent parts of the document and sign.
- Do not affix e- signatures. If one of the members of the nomination team or nominee are out of country, they must be present for the conference and sign the documents in person.
- Send the document in PDF format to the ISMM election chair, **Dr. Savitri Sharma.**

E- mail ID: **savitri@lvpei.org**
Phone: **9989995521**

ISMM Council Members

President	-	Dr. Jayanthi Savio, Bengaluru
Vice President	-	Dr. Shukla Das, New Delhi
General Secretary	-	Dr. Anup K Ghosh, Chandigarh
Joint Secretary	-	Dr. Malini Capoor, New Delhi
Treasurer	-	Dr. Harsimran Kaur, Chandigarh

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Dr. Vinay Kumar Hallur (East), Bhubaneswar

Dr. Arghadip Samaddar (South), Bangalore

Dr. Vijaylatha Rastogi (West), Ajmer

Dr. Ragini Tilak (North), Varanasi

Dr. Joveeta Joseph (Central), Hyderabad

Ex-officio Member (Immediate Past President)

Dr. Anupma Jyoti Kindo, Chennai

Editor, ISMM Newsletter

Dr. Savitri Sharma, Hyderabad

ISMM Website Co-ordinator

Dr. Pratibha Kale, New Delhi

ISMM Zone classification: Finalised by ISMM council on 25-7-23

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East Zone	: Assam, Arunachal Pradesh, Manipur, Meghalaya, Mizoram, Nagaland, Tripura, Sikkim, Bihar, Jharkhand, Odisha, West Bengal
Central Zone	: Chhattisgarh, Madhya Pradesh, Telangana
West Zone	: Goa, Gujarat, Maharashtra, Rajasthan, Punjab, Haryana
South Zone	: Andhra Pradesh, Karnataka, Kerala, Puducherry, Tamil Nadu, Andaman and Nicobar Islands, Lakshadweep

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