



Isolation of fungus from various clinical specimens in patients of a tertiary care hospital of North India

Authors

Dr Mridula Mittal¹, Dr Vishal Sharma², Dr Vishal Gupta^{3*}

¹Assistant Professor, Adesh Medical College, Bathinda

^{2,3}Associate Professor, GGSMCH, Faridkot

*Corresponding Author

Dr Vishal Sharma

Microbiology Department, GGSMCH Faridkot, India

Email: vsgmcs@gmail.com

Abstract

Objective: *In the recent years, the incidence of fungal infections have increased with reports of increased morbidity and mortality associated with it.*

Material and Methods: *The specimens were collected from various patients attending the hospital. The specimens were collected and processed as per the standard mycological procedures.*

Results: *A total of 2430 specimens were received in the Microbiology department from June 2012 to August 2013. Of these, 346 specimens were positive for fungus. The various fungal isolates were Candida albicans, Candida non albicans, Fusarium, Aspergillus niger, Aspergillus fumigatus, Aspergillus flavus, Cryptococcus, Trichophyton mentagrophytes, Trichophyton tonsurans, Trichophyton rubrum, Epidermophyton floccosum, Microsporium species.*

Conclusions: *Early diagnosis of fungal infections using conventional and rapid point of care tests should be carried out for prompt management of the cases. Also the local etiology should be determined to know the common prevalent fungus in a given geographical area.*

Keywords: *Fungus, immunocompromised, mycological, candida, aspergillus.*

Introduction

Fungi have emerged as an important agents causing human infections in last few years. Though fungi are widespread in distribution, but only a few are causing infections in human beings. The infections caused by fungus can be mild and only superficial or cutaneous or may cause life threatening systemic illness.¹ Invasive fungal infections are a significant health problem in immunocompromised patients. The incidence of opportunistic fungal infections have increase in immunodeficient individuals and hospitalised

patients.² Many factors predispose to opportunistic invasive fungal infections like prolonged hospitalisation, anticancer therapy, organ transplantation and AIDS.^{3,4} The isolation of these agents from clinical specimens may indicate colonisation, infection or disease, hence posing a challenge to the clinicians while interpreting the reports. Also many studies have reported increased incidence of resistance among these fungi to various antifungal agents resulting in treatment failures and increased morbidity and mortality.

There is no clear data on prevalence of fungal infections in India. However the climate of our country is suitable for growth of wide varieties of fungus and hence fungal infections. The present study was therefore carried out to look the spectrum of fungal infections in patients of a tertiary care hospital.

Materials and Methods:^{5,6}

This study was conducted in a tertiary care teaching hospital from June 2012 to August 2013. The specimens were received from the inpatients and outpatients of the hospital.. The various specimens received were sputum, urine, pus, CSF, hair, nail, skin scrapings, blood, ocular specimens and pleural fluid.

The specimens were collected using aseptic precautions and were subjected to microbiological examinations as follows:-

Direct microscopy: KOH mount (10 %, for other specimens and 40 % for nail specimens)

Gram staining

India ink preparation for CSF specimens

Culture were done on Sabouraud's dextrose agar with antibiotics and also on Sabouraud's dextrose agar without antibiotics and the cultures were incubated as per standard mycological procedures.

The fungal growth obtained were identified on basis of colony morphology and examination of Lactophenol cotton blue mounts (LCB). The yeast isolates were identified by gram staining and germ tube test.³

Antifungal susceptibility testing was not performed for any of the fungal isolate in our study.

Results

A total of 2430 specimens were received in the microbiology department during the above said period. Of these, 346 specimens were positive for fungus. The results have been depicted in the following tables and diagrams.

Demographic profile of patients with fungal infections

Age	
<1yr	03
1-20 yrs	39
21-40 yrs	170
41-60yrs	87
>60yrs	47
Sex	Males 231 Females 115
Rural	250
Urban	96
Literacy level	
Illiterate	194
Upto matric	100
Graduate and above	52

Type of specimen	Number of fungal isolates
Sputum	135
Pleural fluid	20
Pus	33
Urine	80
Skin scrapings	41
Nail clippings	10
Hair	6
Ocular specimen	1
CSF	08
Blood	12
Total	346

Profile of fungal agents isolated in our study (n=346)

Fungal isolate	Sputum	Skin scraping	Urine	Nail clippings	Pus	Pleural fluid	CSF	Hair	Blood	Ocular specimen	Total
<i>Candida albicans</i>	84	0	56	0	16	15	0	0	2	0	173
<i>Candida non albicans</i>	23	0	24	0	4	5	0	0	10	0	66
<i>Aspergillus niger</i>	5	0	0	0	1	0	0	0	0	0	6
<i>Aspergillus flavus</i>	13	0	0	0	2	0	0	0	0	0	15
<i>Aspergillus fumigatus</i>	10	0	0	0	0	0	0	0	0	0	10
<i>Cryptococcus</i>	0	0	0	0	0	0	8	0	0	0	8
<i>Fusarium</i>	0	0	0	0	10	0	0	0	0	1	11
<i>Trichophyton mentagrophytes</i>	0	23	0	0	0	0	0	2	0	0	25
<i>Trichophyton rubrum</i>	0	13	0	0	0	0	0	0	0	0	13
<i>Trichophyton tonsurans</i>	0	4	0	0	0	0	0	0	0	0	4
<i>Epidermophyton floccosum</i>	0	0	0	10	0	0	0	0	0	0	10
<i>Microsporium species</i>	0	1	0	0	0	0	0	4	0	0	5
Total	135	41	80	10	33	20	8	6	12	1	346

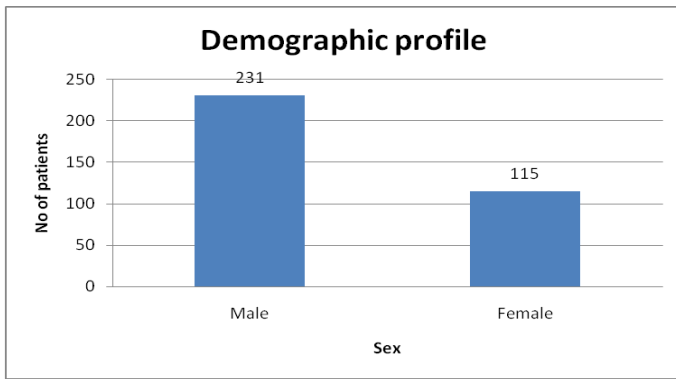


Fig 1

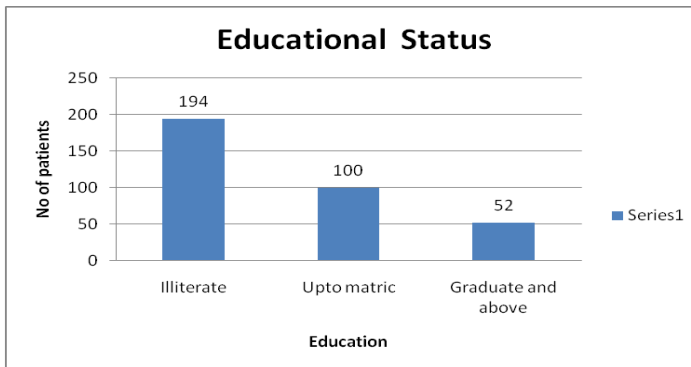


Fig 2

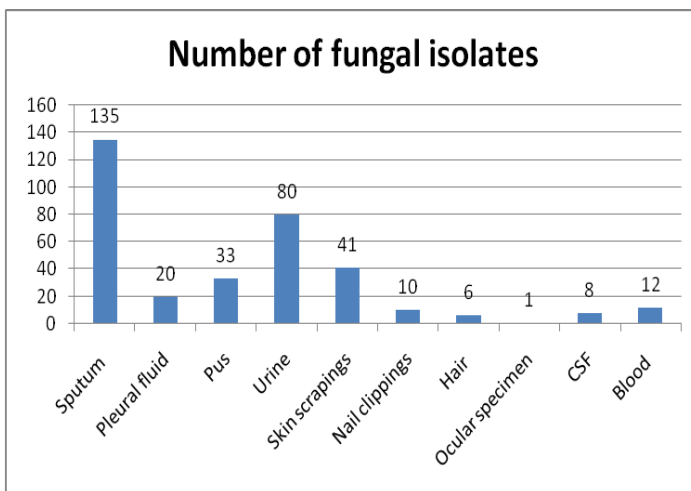


Fig 3

Discussion

In our study, the rate of fungal infections was more in males as compared to females that corroborates the findings of other authors.^{3,7,8} The most common age group affected with fungal infections in our study was from age between 20-60 years that is in accordance with many other studies carried out in our part of the country.³ It may be due to the increased outdoor activities, and greater physical exertion in this group

In our study, Dermatophytes were isolated in majority from skin followed by nail and hair. It was more common in patients belonging to rural background as compared to urban patients. This may be attributed to less awareness of personal hygiene among the patients of rural area who belong to lower socio economic status. Most of these patients were labourers and farmers.

All the CSF specimens in our study were positive for Cryptococcus on examination by India Ink preparation and growth on culture. All these patients were terminally ill and were positive for HIV.

In our study, the blood cultures (12) were obtained and Candida non albicans was the predominant isolate. However Candida albicans was more frequently isolated from urine specimens as compared to Candida non albicans. Majority of these patients were inpatients.

The pattern of fungal infections vary from one geographic region to other. So studies should be carried out to find out the common prevalent fungal agents in a geographic location which would help clinicians to know the epidemiology in their areas and serve as guide in management of the cases. Early laboratory diagnosis would help in reducing the morbidity and mortality associated with these infections.

Conclusion

Diagnosis of fungal infections is important considering an increase in the incidence of these infections in recent years and serious consequences in immunocompromised patients. The conventional methods of diagnosis by culture are time consuming resulting in delay in initiation of the antifungal therapy. Rapid point of care tests must be used wherever available in case of clinical suspicion of fungal infections so that early initiation of antifungal therapy can be done.

Conflict of interest: none
 Source of funding: none
 Acknowledgement: none

References

1. Gandham NR, Jadhav SV, Sardar M, Vyawahare, Misra RR. The spectrum and aetiology of mycotic infections from a tertiary care hospital from western part of India. *J Clin Diag Res* 2013; 7(10): 2157-2159
2. Nucci M, Marr KA. Emerging fungal diseases. *Clin Inf Dis* 2005;41(4):521-526
3. Narayan S, Kumudini TS, Mariraj j, Krishna S. The Prevalence of Keratomycosis, Dermatophytosis and Onychomycosis in a tertiary care hospital. *Int J Med Health Sci* 2012;1(3):25-30
4. Singh N. Trends in the epidemiology of opportunistic fungal infections: Predisposing factors and the impact of antimicrobial use practices. *Clin Infe Dis* 2001;33(10):1692-1696
5. Collee JG, Fraser AG, Marmion BP, Simmons A. Mackie and McCartney Practical Medical Microbiology 14th ed. Churchill Livingstone Publication, New York. 1996;695-717
6. Chander J. 2002. Text Book of Medical Mycology. 2nd Edn. Mehta Publishers, New Delhi, India
7. Aggarwal A, Arora U, Khanna S. Clinical and mycological study of superficial mycoses in Amritsar. *Ind J Dermatol* 2002;47:218-20
8. Singh T, Kashyap AK, Ahluwalia G, Chinna D, Sidhu SS. Epidemiology of fungal infections in critical care setting of a tertiary care teaching hospital in north India: a prospective surveillance study. *J Clin Sci Res* 2014;3:14-25.