FREQUENCY OF CANDIDEMIAS IN A TERTIARY CARE INTENSIVE CARE UNIT

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ABSTRACT

Objective: To determine the frequency of fungal infections in intensive care unit (ICU) of Military Hospital, Rawalpindi, a tertiary care health facility.

Study Design: Cross sectional study.

Place and Duration of Study: Intensive Care Department of Military Hospital Rawalpindi from 01 Jan 2012 to 30 Jun 2012.

Methodology: A total of 89 patients were screened with stay of more than 5 days in intensive care unit. Thirty cases were enrolled in the study for investigation of fungal infections that had fever even after 05 days of being on broad spectrum antibiotics. Culture was done on blood, urine and catheter tip samples as per clinical condition of a patient.

Results: Candida infection was found in 23.4% of study cases. The mean age of study patients was 41.2 ± 20.0 years while 63.4% were female patients as compared to 36.7% males..

Conclusion: Fungal infections especially candidemias are quite frequent in the intensive care units.

Keywords: Candidemias, Fungal infections, Intensive care unit

INTRODUCTION

Invasive fungal infections are increased in patients admitted to intensive care units (ICU) and are associated with high mortality[1,2]. These are the second most common infections in ICU after bacterial infections. The prevalence of fungal infections vary from 10 to 20%, and pose great threat to life with longer hospital stays and thus increased costs[1-3]. The majority of the life threatening infections are caused by well known opportunistic pathogens, like Candida albicans and Aspergillis fungus, while less common species include Candida glabrata, Candida krusei, Candida parapsilosis and Candida tropicalis[4-7]. Overall candidemias are one of the commonest cause of mortality with rates of up to 50%[2,8].

Pfaller and Diekema reported the crude mortality rate due to invasive candidemias around 0.4 deaths per 100000 population per year[5]. Geube M et al found out 28 cases of candida with associated mortality rate of 46.4%[9]. The microbiological diagnosis can be obtained by traditional approach such like macro and microscopic examination, fungal cultures and serological diagnosis[10,11].

Prevention from development of an infection and identification of probable risk factors are important goals in the ICU. We aimed to determine the frequency of fungal infections in patients staying for more than 5 days in the ICU as no data is available about their frequencies in our setups. Our study was to sensitize doctors to this aspect of fungal infections in ICU for early detection and treatment to decrease associated mortality and morbidity.

METHODOLOGY

This cross sectional observational study was conducted at the Intensive Care Unit, Military Hospital, Rawalpindi from 01 Jan 2012 to 30 June 2012. Thirty cases were conveniently enrolled in the study for investigation of fungal infections that had fever even after 05 days of being on broad spectrum antibiotics. Blood, urine and catheter tip samples were sent to Microbiology

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Department, Army Medical College, Rawalpindi for culture and sensitivity. Standard microbiological protocols were followed. Urine was cultured on and CLED (cysteine lactose electrolyte deficient) agar while blood and

Table-1: Demographic characteristics of the patients (n=30).

Age categories (years)	No. of patients (%)
< 30	11 (36.7)
30 to 59	11 (36.7)
60 or above	8 (26.7)
Mean age + SD	41.2 + 20.04
Age range (min – max)	13 – 79
Gender	
Male	11 (36.7)
Female	19 (63.3)

Table-2: Culture result and frequency in candidemia of the patients (n = 30).

	No. of patients	Percentage
Blood culture	7	23.4%
+Urine culture	(2)	(6.6%)
+Catheter tip culture	(2)	(6.6%)
Frequency of candidemias	7	23.4%

Table-3: Management of the patients in the intensive care unit (n = 30).

	No of patients (%)
Antibiotic administered	30 (100.0)
Antifungal administered	7 (23.4)
Duration of therapy (days)	
Up to 5	3 (10.0)
6 – 10	24 (80.0)
> 10	3 (10.0)

catheter tips on Sabouraud agar and declared negative if no growth occurred at four weeks. Microbiological diagnosis of only candidemias was possible in our pathology department as species identification facility is unavailable.

The data analysis was done using statistical package for social sciences (SPSS) version-17. Descriptive statistics were utilized to calculate mean and standard deviations for continuous data. Frequency and percentages were measured from the categorical data. The study outcome was determination of frequency of fungal infections (candida) in patients who had > 5 days of stay in the ICU.

RESULTS

There were 89 patients with duration of stay in ICU of more than 5 days, while a total of 30 patients were conveniently enrolled. The mean age of study patients was 41.2 + 20.0 years ranging from 13 to 79 years. An analysis of different age groups revealed that 11 (36.7%) patients were < 30 years, another eleven (36.7%) were between 30 and 60 years of age while 8 (26.7%) patients were of 60 years or above age. Female gender was in dominance with 63.3% proportion compared to 36.7% males. (Table-1)

As per study objective the frequency of candidemias was calculated which was found out to be 23.4%. Out of total 30 patients, 7 (23.4%) had blood culture positive for candida species. Out of these 2 (6.6%) had positive urine culture while 2 (6.6%) had positive catheter tip culture. (Table-2)

All our patients were on antibiotics while patients with candidemias were given antifungal treatment. Duration of therapy was 6-10 days in 80.0% patients while in 10% cases the duration was up to 5 days and another 10.0% had therapy of more than 10 days. (Table-3)

All data was collected on a proforma– attached as annex A.

DISCUSSION

The current study was planned to determine the frequency of fungal infections (candida) in patients admitted to ICU with 5 or above day stay over.

Fungal infections are quite common in the intensive care unit of our local setting. In the current study we found out 23.4% patients affected by candida pathogens. The incidence of candidal infections is on a rise specially, amongst critically ill patients. Vincent et al reported a similar incidence of 21% patients with fungal

infections in their study[1]. A study from the united states population reported the incidence of fungal infections due to candidemia to be 5 to 10%[12]. Compared to united states, studies from Europe have shown a lower incidence of candidemia with proportions ranging from 2-3% in the bloodstream isolates[13,14]. If we put a more broad look at geographical distribution of the pathogens, Candida glabrata isolates are more common in North America (23.5%), Candida albicans isolates are more common in Asia Pacific region (56.9%), with Candida parapsilosis (25.6%) and Candida tropicalis (17.0%) being more prominent in Latin American region[15].

In the current study female gender was in dominance with (63.3%) proportion while the average age of patients was 41.2 ± 20.0 years. Most of the patients (73%) were below 60 years of age and (27%) were 60 years or above age. Douka E and colleagues revealed a high mean age 68.0 years of their patients[16]. Though there is not much difference in the epidemiology of fungal infections according to age but Candida albicans is predominant in children than in adults. Various trials have revealed that Candida albicans remains, the most common fungal agent associated with invasive candida infection (ICI) regardless of age (55%), followed by Candida parapsilosis, Candida tropicalis, Candida glabrata, and krusei[17].

It is a well known fact that invasive fungal infections (IFIs) are associated with considerable morbidity and mortality even under optimal treatment conditions[18,19]. Delays in appropriate therapy can negatively affect patient outcome.

Morell et al revealed that timely administration of antifungal therapy is associated with improved outcome in patients with IFIs, particularly candidemia[20]. Therefore many intensivists recommend prophylactic antifungal in high risk cases like those on total parental nutrition (TPN), with chronic liver failure, diabetes, on immunosuppression. Whether prophylactic antifungals are better than empiric therapy or pre-emptive therapy is preferable is still controversial. As conventional diagnostic methods result in a late diagnosis of IFIs and unfavorable outcomes in critically ill patients new diagnostic tests like serological and poly merase chain reaction (PCR) for fungal infections is being followed.

Our study had limitations as we only had fungal cultures for candida to make our diagnosis. We did not have any sub typing of candida species available with us. Moreover neither candida mannan antigen nor candida antimannan antibodies assays were available locally.

CONCLUSION

In conclusion, we can say that fungal infections, especially candidemias are quite frequent in the intensive care unit. There is a need to critically monitor these patients and timely diagnose the underlying pathogens so that appropriate intervention can be opted. Despite availability of effective anti fungal pharmacological therapies the rate of mortality and longer hospital stays is a challenge for practitioners involved in critical care medicine. Furthermore, the risk factors and underlying etiological agents should be screened with robust clinical applications so that proper care could be given to these patients. More studies of large scale with vigorous methodological considerations are mandatory before generalization of the current results.

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