

ORIGINAL ARTICLE**Analysis of fungal infections among pediatric subjects: An observational study**¹Anil Kumar Gupta, ²Vinay Kumar Rai¹Associate Professor, ²Assistant Professor, Department of Paediatrics, Gold Field Institute of Medical Sciences, Faridabad, Haryana, India**ABSTRACT:**

Background: The present study was conducted for analyzing fungal infections among pediatric subjects. **Materials & methods:** A total of 100 pediatric subjects were enrolled in the present study. Only those subjects were enrolled which belonged to the age group of less than 15 years. Data extracted from the medical records included history, clinical presentation, biochemical variables and fungal pathogen characterization. Detailed treatment plans and effects were also collected. Characterization of fungal organisms was done. All the results were recorded in Microsoft excel sheet followed by statistical analysis using SPSS software. **Results:** A total of 100 pediatric subjects were analyzed. Among them, 59 were boys while remaining were girls. Out of these 100 subjects, fungal infections were seen in 23 percent of the pediatric subjects. Among these 23 subjects, 13 were boys while the remaining 10 were girls. Among these 23 subjects with fungal infections, Non-albicans Candida spp., Candida albicans and Aspergillus spp. were seen in 56.52 percent, 30.43 percent and 13.04 percent of the patients. **Conclusion:** By understanding the epidemiological and pattern of fungal infections in children, prompt treatment could be started.

Key words: Fungal, Pediatric**Corresponding author:** Vinay Kumar Rai, Assistant Professor, Department of Paediatrics, Gold Field Institute of Medical Sciences, Faridabad, Haryana, India**This article may be cited as:** Gupta AK, Rai VK. Analysis of fungal infections among pediatric subjects: An observational study. J Adv Med Dent Sci Res 2015;3(1):341-343.**INTRODUCTION**

A majority of children, at one time or other suffers some or the other form of fungal infection. For instance, if a child develops a rash on the buttocks or white patches in the mouth, it is as a result of fungal or yeast infection. Fungal infections which were quite rare at the beginning of this century are now increasingly growing at a rapid rate. This is probably due to the result of the increase in number of immunocompromised children.^{1, 2} Normally children have strong natural immunity to fungi. Only a couple of fungi out of thousands are pathogenic. Fungi are very good at taking advantage of some abnormality in the human host and, thus, virtually every fungal infection is opportunistic.^{3, 4}

Among immunosuppressed children, the impact of an invasive fungal infection can be devastating, with a high rate of morbidity and mortality. Neonates and children with primary and secondary immunodeficiencies are particularly at risk. Candida and Aspergillus spp. are the most commonly isolated organisms. Timely diagnosis and initiation of appropriate antifungal therapy is imperative for improving outcomes.^{5, 6} Hence; the present study was conducted for analyzing fungal infections among pediatric subjects.

MATERIALS & METHODS

The present study was conducted for analyzing fungal infections among pediatric subjects. A total of 100 pediatric subjects were enrolled in the present study. Only those subjects were enrolled which belonged to the age group of less than 15 years. Data extracted from the medical records included history, clinical presentation, biochemical variables and fungal pathogen characterization. Detailed treatment plans and effects were also collected. Diagnostic criteria were according to the Revised Definitions of Invasive Fungal Disease from the EORTC/MSG Consensus Group (2008)⁷. Characterization of fungal organisms was done. All the results were recorded in Microsoft excel sheet followed by statistical analysis using SPSS software.

RESULTS

A total of 100 pediatric subjects were analyzed. Among them, 59 were boys while remaining were girls. Out of these 100 subjects, fungal infections were seen in 23 percent of the pediatric subjects. Among these 23 subjects, 13 were boys while the remaining 10 were girls. Among these 23 subjects with fungal infections, Non-albicans Candida spp., Candida albicans and Aspergillus spp. were seen in 56.52 percent, 30.43 percent and 13.04 percent of the patients.

Table 1: Demographic data

Variable		Number (%)
Age group (years)	Less than 5	38
	5 to 10	39
	More than 10	23
Gender	Boys	59
	Girls	41

Table 2: Prevalence of fungal infections

Fungal infections	Number	Percentage
Present	23	23
Absent	77	77
Total	100	100

Table 3: Pattern of fungal infections

Fungal infections	Number	Percentage
Non-albicans Candida spp.	13	56.52
Candida albicans	7	30.43
Aspergillus spp.	3	13.04
Total	23	100

DISCUSSION

Invasive fungal infections in children appear to have increased over the past few decades primarily because there has been an increase in children with primary or secondary immune deficiencies. The growth in this population that is susceptible to fungal infections has been multifactorial, as a result of: an increase in neonates surviving preterm delivery, more intense chemotherapy regimens for the treatment of cancer, expanded indications for bone marrow and solid organ transplantation, and improved diagnostic and therapeutic modalities for identifying and treating primary immune deficiencies.^{7,8}

Candida spp. are important pathogens of nosocomial invasive infections, most commonly bloodstream infections. In a 1-year survey on a pediatric intensive care unit (ICU), Candida spp. caused 10% of all documented nosocomial infections. Similarly, in a recent case-control study involving children who had undergone cardiovascular surgery, Candida spp. were isolated in 15% of the recorded nosocomial infections.^{9,10}

A total of 100 pediatric subjects were analyzed. Among them, 59 were boys while remaining were girls. Out of these 100 subjects, fungal infections were seen in 23 percent of the pediatric subjects. Among these 23 subjects, 13 were boys while the remaining 10 were girls. Among these 23 subjects with fungal infections, Non-albicans Candida spp., Candida albicans and Aspergillus spp. were seen in 56.52 percent, 30.43 percent and 13.04 percent of the patients. In France, a 1-day national survey of nosocomial infections performed in 2001 included 21,596 children younger than aged 18 years (7.1% of all hospitalized children). Overall, 2.4% presented with a nosocomial infection (1.2% for newborns and 3.3% for children). ICI, in this study, accounted for 4.4% of all infections, regardless of which unit the

children were hospitalized in. The rate of nosocomial infections in children hospitalized in PICUs was approximately 15%.¹¹

Multiple published reports have suggested a steady rise in paediatric invasive candidiasis ever since the 1970s. In both children and adults, Candida albicans is the most frequently isolated species overall, accounting for 50–70% of invasive candidiasis, depending on the location and the patient population studied. Candida parapsilosis is the most common non-albicans Candida species found in children, accounting for 15–45% of the infections and, in particular, its incidence has been increasing among premature neonates. By contrast, species such as Candida glabrata and Candida krusei, which are important because of their reduced fluconazole susceptibility, are far less common in children than in adults.¹²⁻¹⁴

As contemporary medicine advances the treatment of life-threatening conditions such as malignancies, organ transplantation, and autoimmune disorders, invasive fungal infections have become a major complication. Candida species constitute the fourth most common pathogen isolated in nosocomial bloodstream infections. Cryptococcal meningitis caused by Cryptococcus neoformans and Cryptococcus gattii is the most common cause of fungal central nervous system infection in the world today, primarily producing disease in immunocompromised patients, but also causing disease in apparently normal hosts. The incidence of invasive aspergillosis (IA) caused by Aspergillus fumigatus has increased three-fold in the last decade, and IA mortality has correspondingly risen by over 300%. The Infectious Diseases Society of America listed A. fumigatus as one of only six infectious pathogens for which a substantive treatment breakthrough is urgently needed.¹⁵⁻¹⁸

CONCLUSION

By understanding the epidemiological and pattern of fungal infections in children, prompt treatment could be started.

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