Assessment of Infection Prevention and Control Measures in Pediatric Hematology Oncology Unit, Ain Shams University

W Ibrahim , M Ashraf, K Eltonbary

Ain Shams University, Cairo, Egypt

Introduction

There are various factors which contribute to the increased susceptibility to infections in Pediatric Hematology/Oncology (PHO) patients, most prominent of them being disruption of cutaneous and mucosal barriers (oral, gastrointestinal, etc.), microbial gastrointestinal translocation, and insufficient quantities and inadequate function of phagocytes(1).

Aim

To assess the currently applied infection prevention and control (IPC) measures among Pediatric Oncology and Hematology patients admitted to the inpatient unit

Objectives

To evaluate the health care professional's (HCP) practices and their vaccination status and and to explore areas of improvement of IPC measures.

Methods

A cross-sectional observational study was conducted at the Hematology and Oncology unit, Children's Hospital at Ain Shams University from April 2023 to September 2023. The practice and vaccination status of twenty HCPs including both physicians and nurses was also assessed. Laboratory investigations mainly included the results of the peripheral and central blood cultures. Laboratory-confirmed blood stream infection (LCBI) and central lines associated blood stream infections (CLABSI) were reported. Site-specific infection as pneumonia or urinary tract infection were diagnosed based on imaging and/or laboratory test (Respiratory panel urine culture and sensitivity). Febrile neutropenia episodes were documented and classified into high and low risk. Health care facility and guides were assessed, including: guides for neutropenic diet, source of water supply, isolation ,environmental cleaning, details about disinfectants usage. Dental and local mouth care and prophylactic and therapeutic antibiotic and antifungal use. Antiseptic and hand hygiene precautions(use of masks, gowns or gloves),health care professional (HCP) vaccination status were observed and reported at different time points.

Results

The study included 100 patients with a mean age of 7.35±3.78 years, no significant gender difference, males represented 52%. Thirty-one febrile neutropenia episodes were reported. Strict guides were followed during central lines, venous access or indwelling catheter application. HCP vaccination status was defective in annual flu vaccine, however all were fully vaccinated with hepatitis B and COVID vaccines. Mucositis was reported in 45 % and was significantly correlated with sepsis-related mortality. Among the laboratory confirmed blood stream infections (LCBI) staphylococcus aureus and staph coagulase negative dominated while in the reported central line associated blood stream infections (CLABSI) (15%), klebsiella was the commonest organism.

Laboratory confirmed blood stream infection and Central Line-Associated Bloodstream Infections

		Studied Patients (n=100)	
		N	%
LCBI (38)	No	64	64%
	Klebsiella	5	5%
	Staph	19	19%
	Candida	6	6%
	Pseudomonas	2	2%
	Klebsiella MDR	4	4%
CLABSI (17)	No	85	85%
	Klebsiella	6	6%
	Staph	4	4%
	Candida	3	3%
	Klebsiella MDR	2	2%

Summary

Staphylococcal infection and klebsiella were the commonest reported pathogens. Though strict sterile measures were followed, still coagulase negative staph was a common pathogen among the reported CLABSI(s). Mucosal barrier injury (MBI) was a significant risk for microbial translocation and morbidity.

Discussion

Children with hematological and/or oncological disease have a high risk for infections due to neutropenia, immunosuppressive therapy, impaired mucosal barrier, and CVC(1). In the current study, BSI represented the majority with 51%, followed by confirmed UTI(6%) and GI infections(5%).LCBI was confirmed in 38% with 6% fulfilling criteria for MBI-LCBI with candidal growth. The current study presents data on antibiotic and antifungal usage. Among antibiotics, Levofloxacin was the most commonly used prophylaxis(63%). In the current study, regarding dental practices, only 2% received pre-chemotherapy dental assessment and 36 % adhered to dental care including the use of extrasoft dental brush or regular mouth wash. Dental care, water supply and healthcare professionals' immunizations are important areas to improve in order to improve the PHO ward.

References

1- Lv H, Ning B. Pathogenesis of bloodstream infection in children with blood cancer. Experimental and therapeutic medicine. 2013; 5(1):201-4.