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PREDICTORS OF MORTALITY OF PEDIATRIC CANCER PATIENTS ADMITTED TO THE INTENSIVE CARE UNIT (ICU) IN A LOW MIDDLE INCOME COUNTRY (LMIC)

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BACKGROUND

Advances in cancer treatment have significantly improved survival rates for cancer patients, but this has also led to an increase in the number of pediatric cancer patients requiring ICU admission due to the severity of their illness and treatment complications. Understanding the predictors of mortality for this patient population is crucial for improving outcomes.

METHODS

Retrospective study including patients younger than or aged 18 years old at diagnosis of malignancy who were admitted to the medical ICU in The Children Cancer Hospital Egypt from January 1, 2019, to August 1, 2021. The primary objectives were to determine the mortality rate, identify the common causes of ICU admissions, and analyze the predictors of mortality among the pediatric cancer patients admitted to the ICU.

CONTACT INFORMATION

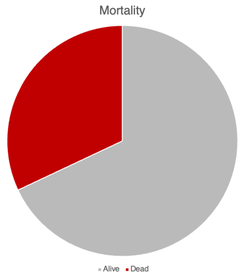
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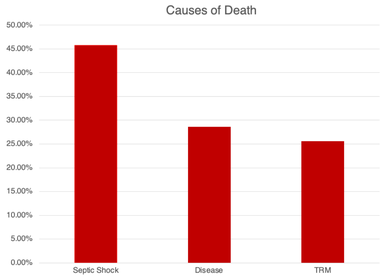
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RESULTS

A total of 1,501 patients were included. The most common diagnoses were hematological malignancies, including acute lymphoblastic leukemia (24%) and acute myeloid leukemia (13%). The most common causes of admission were sepsis (39%) and respiratory failure (31%). 17% of patients were admitted to the ICU on presentation as new cases. The mortality rate for the whole cohort was 32%. The most common causes of death were sepsis (45%) and disease progression/relapse (28.6%). Multivariable analysis identified higher mortality for patients admitted with septic shock (OR= 6.01, 95%CI 3.97-9.23, P<0.001) and respiratory failure (OR= 6.35, 95%CI 4.13-9.97, P<0.001), patients with progressive disease (OR= 1.86, 95%CI 1.38-2.50, P<0.001), those transferred from inpatient wards (OR= 1.63, 95%CI 1.20-2.22, P= 0.002) and patients with longer ICU stay (OR= 1.04, 95%CI 1.04-1.06, P<0.001).





Characteristic	OR[1]	95% CI[1]	p-value
AGE	0.96	0.94, 0.99	0.002
LOS_Inpatient	1.01	1.00, 1.01	0.046
LOS_ICU	1.04	1.03, 1.06	<0.001
transfer_from			
ER	—	—	
IP	1.63	1.20, 2.22	0.002
disease_status_			
not progressive	—	—	
progressive	1.86	1.38, 2.50	<0.001
septic_shock			
no	—	—	
yes	6.01	3.97, 9.23	<0.001
respiratory_failure			
no	—	—	
yes	6.35	4.13, 9.97	<0.001
cerebral_failure			
no	—	—	
yes	2.96	1.86, 4.77	<0.001
hepatic_dysfunction			
no	—	—	
yes	6.01	1.88, 20.7	0.003
CVS_dysfunction			
no	—	—	
yes	2.91	1.91, 4.49	<0.001
renal_dysfunction			
no	—	—	
yes	5.43	2.95, 10.0	<0.001

[1]OR = Odds Ratio, CI = Confidence Interval

Multivariable analysis using logestic regression model

CONCLUSIONS

Pediatric cancer patients admitted to the ICU in LMICs have a high mortality rate, which confirms the need for targeted strategies to improve outcomes in this vulnerable population. Key approaches suggested by our research include early cancer diagnosis, optimized identification of early warning signs of critical illness, and decreasing sepsis-related mortalities by strict infection control, early diagnosis, and antimicrobial stewardship programs.

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