Barriers to Improve Outcome of Children with Acute Lymphoblastic Leukemia in Low-middle Income Countries

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Background

The survival outcome of childhood acute lymphoblastic leukemia has steadily improved during the last several decades, to a current rate of approximately 80%. This success has been attributed to more optimal use of anti-leukemic agents, intensification of treatment for high risk patients, refinement of risk stratification and improvements in supportive care

Despite recent improvement in the supportive care services, treatment related deaths remain one of the major problems that affect the outcome of pediatric acute lymphoblastic leukemia (ALL), especially in middle income countries

Objective

The study aimed to assess the incidence, risk factors and outcomes of treatment related complications during therapy of pediatric ALL

Materials & Methods

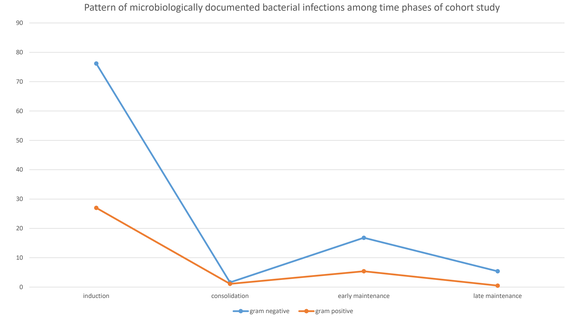
A Retrospective study included patients 434 patients, ≤ 18 years old with pediatric ALL, treated according to St. Jude total XV protocol at the National Cancer Institute, Cairo University from January 2012 to December 2017. All patients were reviewed and analyzed for treatment related toxicities, overall and attributable mortality rates

	total N=434	induction	consolidation	Early maintenance	Late maintenance
Overall mortality	142(32.%)	91(21%)	1(0.2%)	19(4.4%)	10(2.3%)
Infection	121(28%)	83(19%)	-	17(3.9%)	10(2.3%)
Cerebro-vascular	3(0.7%)	1(0.2%)	-	1(0.2%)	-
Organ damage	6(1.4%)	4(0.9%)	1(0.2%)	1(0.2%)	-
Disease related	12(2.8%)	3(0.7%)	-	-	-

Attributable mortality rates according to cause of death among treatment phases

Results

Out of the total group, there were 367 patients (84.5%), developed documented infectious complications, 58 (13%) had cerebrovascular complications, and 18 (4%) had organ damage. Bacterial infection was the most frequent throughout all treatment phases, diagnosed in 74.2%, followed by invasive fungal infection in 17.7% and viral infections in 8.0% of the patients. Gram negative infections were more predominant during all treatment phases (65% compared to 35% gram positive). The most frequent Gram negative was E-coli (37.7%), klebsiella (25.4%) and acinetobacter (16.4%). MDR was more frequently found among E-coli infection (52.2%). With median follow up of 101 months, the 5-year overall survival (OS) and event free survival (EFS) for the whole group were 67.3% and was 58.8% respectively. Overall mortality rate was 32.6%, infection related mortality constitutes 91.0% of them while the remaining was either due to organ damage or disease related. The attributable mortality rate was highest among E-coli (65.2%) followed by Klebsiella and acinetobacter (42.0% & 20.0%) respectively. The 5-year OS and EFS were significantly worse in those with infection complications (OS 37.7% versus 61.4%, P< 0.001) and (EFS 57% versus 84%, P= 0.006) respectively



Conclusions

Infectious complications are major obstacle to reach desirable outcome for pediatric patients with ALL in developing countries. Gram negative infection especially MDR remains a major challenge that warrants more attention and prompt intervention during treatment of those patients.

References

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