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Original Research Article

Survival Outcomes and Epidemiological Characteristics of Pediatric Leukemia: A Retrospective Cohort Study from a Tertiary Cancer Center in Western India

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ABSTRACT

Background
Leukemia represents the most common malignancy among children worldwide and contributes substantially to pediatric cancer mortality, particularly in low- and middle-income countries. Survival outcomes vary widely depending on disease subtype, treatment availability, and healthcare resources.

Objectives
To evaluate the epidemiological characteristics and survival outcomes of pediatric leukemia patients treated at a tertiary care cancer center in Western India.

Materials & Methods
A retrospective cohort study was conducted at the Gujarat Cancer and Research Institute (GCRI), Ahmedabad. Pediatric patients aged ≤18 years diagnosed with leukemia in the year 2019 were included and followed up for the period of five years till December 2024. Data were extracted from hospital-based cancer registry records and medical case files. Kaplan–Meier survival analysis was used to estimate overall survival, and regression analysis was performed to identify factors associated with mortality.

Results
A total of 424 pediatric leukemia patients were included in the study. The cohort comprised 65.6% males and 34.4% females, with a mean age at diagnosis of approximately 8.5 years. Acute lymphoblastic leukemia (ALL) was the most common subtype (77.4%), followed by acute myeloid leukemia (AML) (17%) and chronic myeloid leukemia (CML) (5.7%). The five-year overall survival proportion was 46.2%. Kaplan–Meier analysis demonstrated significant differences in survival according to leukemia subtype ($p<0.001$). In multivariate analysis, AML was associated with a significantly higher risk of mortality compared with CML (AOR=4.56; 95% CI:1.67-12.46; p=0.003).

Conclusion
The study demonstrates substantial variation in survival outcomes among pediatric leukemia subtypes, with AML showing significantly poorer prognosis compared with ALL and CML. Strengthening early diagnosis, treatment adherence, and supportive care services in tertiary cancer centers may improve survival outcomes among children with leukemia in India.

Keywords: Pediatric leukemia, Survival analysis, Kaplan–Meier, Childhood cancer, Epidemiology

INTRODUCTION

Cancer represents a significant cause of mortality among children and adolescents worldwide. Among pediatric cancers, leukemias are most frequently diagnosed, followed by tumors of the central nervous system, lymphomas, and various solid tumors.[1] Leukemia comprises a heterogeneous group of hematological malignancies arising from uncontrolled proliferation of immature leukocyte precursors within the bone marrow. Among the different subtypes, acute lymphoblastic leukemia (ALL) accounts for the majority of cases, followed by acute myeloid leukemia (AML) and chronic myeloid leukemia (CML). [2] Survival following a diagnosis of childhood cancer varies substantially across countries and is strongly influenced by the level of healthcare resources available. In high-income settings, cure rates exceed 80%, whereas in many low- and middle-income countries, survival remains below 30% due to limitations in early diagnosis, access to treatment, and supportive care. [3]

In India, data from hospital-based cancer registries under the National Cancer Registry Programme (NCRP) indicate that leukemia constitutes approximately 40% of all malignancies diagnosed among children aged 0–14 years, representing the single largest diagnostic category.[4] Although survival outcomes have improved in tertiary centers with standardized treatment protocols, they continue to lag behind those reported in high-income countries. Contributing factors include delayed diagnosis, infection-related complications, malnutrition, treatment abandonment, and disparities in access to specialized pediatric oncology services.[5]

Survival analysis provides a structured statistical framework for evaluating time-to-event outcomes in cancer research. The Kaplan-Meier estimator enables calculation of survival probabilities over specified follow-up intervals, while the Cox proportional hazards model allows assessment of independent prognostic factors influencing mortality risk. These methods are widely applied in oncological studies to generate clinically relevant survival estimates and risk stratification models. [6]

Although several studies have evaluated pediatric leukemia outcomes at national and international levels, there is limited institution-specific evidence from tertiary cancer centers in India that examines both epidemiological characteristics and survival outcomes using retrospective cohort designs. Hospital-based studies play a critical role in generating real-world evidence regarding disease patterns, treatment outcomes, and survival trends in specific populations. Such data are essential for evaluating the effectiveness of existing treatment protocols and identifying areas for improvement in Pediatric oncology care. Furthermore, survival data from tertiary care centers can contribute to strengthening cancer control programs and improving healthcare delivery for children with leukemia. Therefore, the present study aimed to evaluate the epidemiological profile, leukemia subtype distribution, and overall survival outcomes among pediatric leukemia patients treated at a tertiary cancer center in Western India using Kaplan–Meier survival analysis and multivariable regression modelling

MATERIALS AND METHODS

Study Design
This study was conducted as a retrospective cohort study.

Study Setting
The study was carried out at a tertiary care cancer center - The Gujarat Cancer and Research Institute [GCRI], Ahmedabad in India with a dedicated pediatric oncology department providing diagnostic, chemotherapeutic, and supportive care services. The institution functions as a referral center for both urban and rural populations.

Study Period
The study included patients diagnosed in the year 2019. A five-year follow-up data were collected up to the most recent documented clinical visit or recorded death till December 2024.

Study Population
All pediatric patients aged 0–18 years diagnosed with leukemia (ALL, AML, or CML) during the study period and registered at the tertiary care center were eligible for inclusion.

Inclusion Criteria
• Confirmed diagnosis of leukemia based on bone marrow examination, immunophenotyping, and/or cytogenetic evaluation.
• Age ≤ 18 years at the time of diagnosis.
• Initiated treatment at the study center.
• Availability of baseline clinical records and follow-up data.

Exclusion Criteria
• Patients with incomplete medical records regarding diagnosis or outcome.
• Patients who were transferred to another institution immediately after diagnosis without follow-up data.
• Relapsed cases previously treated elsewhere.

Sample Size

The sample size for the present study was determined using a total enumeration approach. All pediatric patients aged 0–18 years diagnosed with leukemia (ALL, AML, and CML) and registered at GCRI in the year 2019 were considered for inclusion.

Based on hospital-based cancer registry records and medical file review, a total of 424 pediatric leukemia cases fulfilled the eligibility criteria and were included in the final analysis. Since this was a retrospective cohort study utilizing existing institutional data, formal sample size calculation was not performed. Instead, all available eligible cases during the defined study period were included to maximize statistical power and improve the precision of survival estimates.

Data Collection Procedure

Data were extracted from hospital-based cancer registry records and medical case files using a pre-designed structured data extraction proforma. Baseline demographic and clinical information at the time of diagnosis was obtained from hospital records. To ascertain the survival status and follow-up information, additional data were obtained through active follow-up. Contact details available in the hospital records were used to reach patients or their caregivers through telephone calls. These follow-up calls were conducted by trained social health workers associated with the hospital. During the telephonic interaction, information regarding the current health status of the patient (alive, deceased, or lost to follow-up), date of last follow-up, and where applicable, the date and reported cause of death were documented.

For patients who were not reachable after multiple attempts or whose contact information was no longer valid, the last recorded hospital visit date was considered as the last known follow-up for survival analysis. All collected data were recorded in the standardized data collection form and subsequently entered into a secured database for statistical analysis.

Operational Definitions

Overall Survival (OS)

The length of time from either the date of diagnosis or the start of treatment for a disease, such as cancer, that patients diagnosed with the disease are still alive. In a clinical trial, measuring the overall survival is one way to see how well a new treatment works. Also called OS.[7]

Statistical Analysis

Data were entered into Microsoft Excel and analyzed using Jamovi V2.6.23 statistical software.

Descriptive Analysis
• Continuous variables: mean ± standard deviation
• Categorical variables: frequency and percentage
Survival Analysis
• Kaplan–Meier method was used to estimate overall survival probabilities.
• Survival curves were generated for:
- Overall cohort
- Leukemia subtype
- Gender
- Age group
- State

Multivariate Analysis

Regression analysis was performed to identify independent predictors of mortality. Variables with $p < 0.05$ in univariate analysis were entered into the multivariate model.
A p-value < 0.05 was considered statistically significant.

Ethical Considerations

The study was approved by the Institutional Ethics Committee of The Gujarat Cancer and Research Institute. As this was a retrospective record-based study, informed consent was waived. Confidentiality of patient information was maintained by anonymizing data during extraction and analysis.

RESULTS

Table-1 presents the descriptive statistics for age and overall survival (OS) among the study participants stratified by gender. A total of 424 patients were included, comprising 278 males and 146 females. The mean age at diagnosis was slightly higher among males (8.86 ± 5.39 years) compared to females (7.71 ± 4.98 years). The mean overall survival duration was comparable between both genders, with females demonstrating a mean survival of 37.21 months and males 37.72 months. The median survival time was 46.5 months for females and 43.5 months for males, indicating a similar survival pattern across genders within the cohort.

Table-1: Descriptive statistics of age at diagnosis and overall survival by gender among pediatric leukemia patients (n = 424)

Variables	Gender	N	Mean	Median	SD
Age (years)	Female	146	7.71	7	4.98
	Male	278	8.86	8.5	5.39
Overall Survival (months)	Female	146	37.21	46.5	29.58
	Male	278	37.72	43.5	28.04

Table-2 illustrates the distribution of study participants across different age groups categorized into 5-year and 10-year intervals. In the 5-year age classification, the highest proportion of patients was observed in the 5-9-year age group, followed by the 0-4-year group. Males constituted a greater proportion of the cohort across all age groups, accounting for 65.6% of the total study population, while females represented 34.4%. In the 10-year age grouping, the

majority of patients were below 10 years of age, indicating that leukemia diagnosis occurred more frequently in early childhood within the study population.

Table-2: Age and gender distribution of pediatric leukemia patients (n=424)

5 years age group	Gender	Counts	% of total
0-4	**Female**	46	10.80%
	Male	81	19.10%
5-9	**Female**	49	11.60%
	Male	70	16.50%
10-14	**Female**	31	7.30%
	Male	64	15.10%
15-19	**Female**	20	4.70%
	Male	63	14.90%
Total	**Female**	146	34.43
	Male	278	65.57
10 years age group	**Gender**	**Counts**	**% of total**
0-9	**Female**	95	22.40%
	Male	151	35.60%
10-19	**Female**	51	12.00%
	Male	127	30.00%

Table-3 summarizes the geographic distribution of patients according to their district and state of residence. Most patients originated from districts within Gujarat, with Ahmedabad contributing the largest proportion of cases for both males and females. A considerable proportion of patients also belonged to neighboring states such as Rajasthan and Madhya Pradesh, reflecting the referral nature of the treatment center. Approximately three-quarters of the patients were residents of Gujarat, while the remaining patients were from other states, highlighting the regional catchment area of the hospital.

Table-4 presents the distribution of leukemia types and the survival status of patients at the time of follow-up. Acute lymphoblastic leukemia (ALL) was the most common morphological subtype, accounting for the majority of cases among both males and females. Acute myeloid leukemia (AML) represented a smaller proportion, while chronic myeloid leukemia (CML) was relatively rare. At the end of the follow-up period, 195 patients (45.99%) were alive, whereas 229 patients (54.01%) had died. Survival proportions were slightly higher among females compared to males.

Table-3: Geographic distribution of pediatric leukemia patients by district and state

District	Male		Female	
	N	%	N	%
Ahmedabad	38	13.66	24	16.45
Banaskantha	23	8.26	7	4.79
Surat	13	4.67	6	4.12
Amreli	10	3.6	2	1.38
Anand	10	3.6	3	2.05
Bhavnagar	10	3.6	2	1.37
Rajkot	10	3.6	7	4.79
Surendranagar	9	3.24	3	2.05
Jamnagar	8	2.88	3	2.05
Mehsana	8	2.88	1	0.68
Kheda	7	2.52	3	2.05
Vadodara	7	2.52	3	2.05
Devbhoomi Dwaraka	6	2.16	1	0.68
Gandhinagar	6	2.16	1	0.68
Gir Somnath	6	2.16	4	2.74
Junagadh	5	1.8	2	1.37
Kachchh	5	1.8	4	2.74
Panchmahal	5	1.8	2	1.37
Dahod	4	1.44	6	4.12
Arvalli	3	1.08	1	0.69
Mahisagar	3	1.08	3	2.05
Porbandar	3	1.08	2	1.37
Sabarkantha	3	1.08	1	0.68
Chhota Udepur	2	0.72	0	0
Narmada	2	0.72	1	0.68
Valsad	2	0.72	6	4.11
Bharuch	1	0.36	0	0
Botad	1	0.36	2	1.37
Morbi	1	0.36	2	1.37
Patan	1	0.36	5	3.42
Navsari	0	0	1	0.69
Tapi	0	0	3	2.06
Outside	66	23.73	35	23.98

Table-5 presents Kaplan–Meier survival estimates for the study cohort at multiple follow-up intervals up to 60 months. The overall survival probability declined

progressively over time, decreasing from 73.3% at 6 months to 46.2% at 60 months. Age-specific survival patterns indicated slightly higher survival probabilities among younger children in the early follow-up period. Survival estimates also varied according to leukemia subtype, with CML demonstrating markedly higher survival probabilities compared to ALL and AML. These findings highlight differences in prognosis according to disease morphology and follow-up duration.

Table-4: Distribution of leukemia morphology and survival status among study participants (n=424)

	Male		Female	
	N	%	N	%
Morphology				
ALL	218	78.41	110	75.34
AML	47	16.92	25	17.12
CML	13	4.67	11	7.5
Survival Status				
Alive	126	45.32	69	47.26
Death	152	54.68	77	52.74

Table 5: Kaplan–Meier survival distribution according to demographic and clinical variables

Variables		Respondents	Deaths	Survived (%)	P value
All cohorts		424	229	195 (45.99)	-
5 years age group	0-4	127	64	63 (49.61)	0.89
	5-9	119	63	56 (47.06)	
	10-14	95	56	39 (41.05)	
	15-19	83	46	37 (44.58)	
10 years age group	0-9	246	127	119 (48.37)	0.58
	10-19	178	102	76 (42.7)	
Gender	Female	146	77	69 (47.26)	0.97
	Male	278	152	126 (45.32)	
State	Outside	101	57	44 (43.56)	0.56
	Gujarat	323	172	151 (46.75)	
Morphology	ALL	328	175	153 (46.65)	0.00058 *
	AML	72	47	25 (34.72)	
	CML	24	7	17 (70.83)	

Figure-1 illustrates survival curves according to leukemia subtype. Patients diagnosed with CML demonstrate significantly better survival compared with those with ALL and AML. In contrast, AML patients show the lowest survival probability throughout the follow-up period, indicating a poorer prognosis relative to other leukemia subtypes.

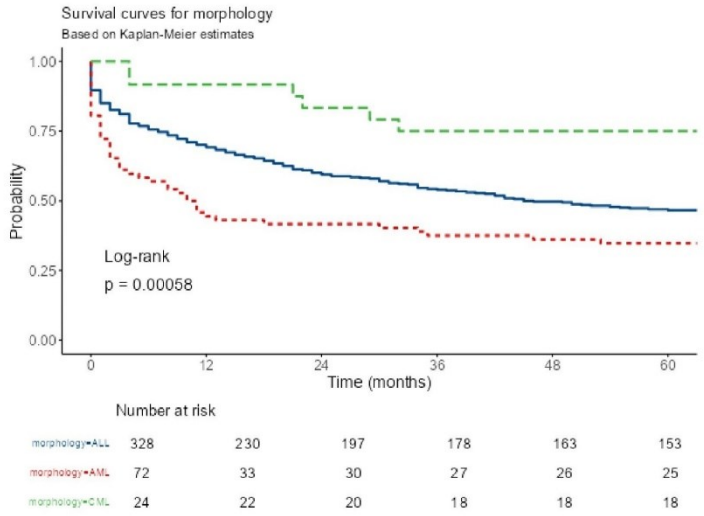

Figure-1: Kaplan–Meier survival curves according to leukemia morphology

Figure-2 illustrates the Kaplan–Meier survival curves stratified by 5-year age groups. Although minor differences in survival trends are observed between age categories, the overall pattern of survival decline remains similar across groups. Younger age groups demonstrated slightly better survival during the early follow-up period, though these differences were not statistically significant.

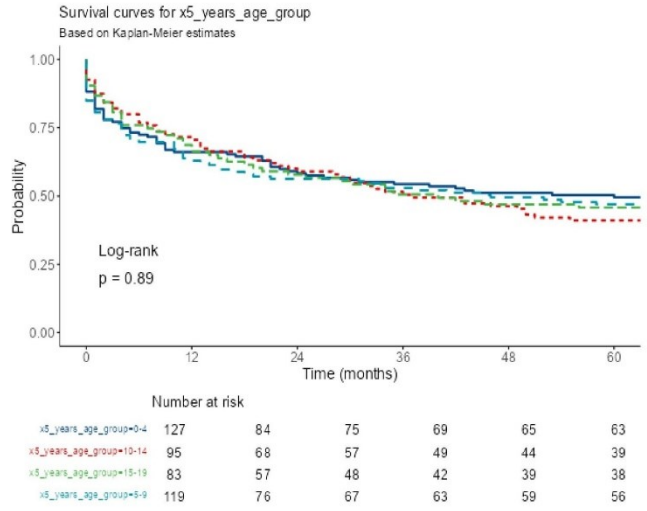

Figure-2: Kaplan–Meier survival curves according to 5-year age groups

Table-6 shows the association between selected demographic and clinical variables and survival status among pediatric leukemia patients. State-wise distribution of patients and the broader classification of Gujarat versus outside Gujarat were not significantly associated with survival outcomes (p = 0.5911 and p = 0.5751 respectively). However, leukemia morphology showed a statistically significant association with survival status (p = 0.0081). A higher proportion of deaths was observed among AML patients, whereas CML patients demonstrated relatively better survival outcomes. These findings suggest that leukemia subtype plays a significant role in determining survival in the study cohort.

Table-6: Association between demographic and clinical characteristics and survival status among pediatric leukemia patients using Chi-square test (n = 424)

Chi-square (Test of Independency)		Alive (N=195)	Death (N=229)	Total (N=424)	p value
5 Years Age Group	0-4	63.0 (32.3%)	64.0 (27.9%)	127.0 (30.0%)	0.632
	5-9	56.0 (28.7%)	63.0 (27.5%)	119.0 (28.1%)	
	10-14	39.0 (20.0%)	56.0 (24.5%)	95.0 (22.4%)	
	15-19	37.0 (19.0%)	46.0 (20.1%)	83.0 (19.6%)	
10 Years Age Group	0-9	119.0 (61.0%)	127.0 (55.5%)	246.0 (58.0%)	0.247
	10-19	76.0 (39.0%)	102.0 (44.5%)	178.0 (42.0%)	
Gender	Male	126.0 (64.6%)	152.0 (66.4%)	278.0 (65.6%)	0.704
	Female	69.0 (35.4%)	77.0 (33.6%)	146.0 (34.4%)	
State Wise Distribution	Gujarat	151.0 (77.4%)	172.0 (75.1%)	323.0 (76.2%)	0.591
	Chhattisgarh	1.0 (0.5%)	0.0 (0.0%)	1.0 (0.2%)	
	Daman And Diu	1.0 (0.5%)	0.0 (0.0%)	1.0 (0.2%)	
	Jharkhand	0.0 (0.0%)	1.0 (0.4%)	1.0 (0.2%)	
	Madhya Pradesh	9.0 (4.6%)	17.0 (7.4%)	26.0 (6.1%)	
	Rajasthan	29.0 (14.9%)	34.0 (14.8%)	63.0 (14.9%)	
	Uttar Pradesh	4.0 (2.1%)	5.0 (2.2%)	9.0 (2.1%)	
State	Gujarat	151.0 (77.4%)	172.0 (75.1%)	323.0 (76.2%)	0.575
	Outside	44.0 (22.6%)	57.0 (24.9%)	101.0 (23.8%)	
Morphology	CML	17.0 (8.7%)	7.0 (3.1%)	24.0 (5.7%)	0.008*
	ALL	153.0 (78.5%)	175.0 (76.4%)	328.0 (77.4%)	
	AML	25.0 (12.8%)	47.0 (20.5%)	72.0 (17.0%)	

Table-7 presents the Kaplan–Meier estimated overall survival probabilities of the pediatric leukemia cohort across successive follow-up intervals from 6 to 60 months. At 6 months, the survival probability was 73.3% (95% CI: 69.3–77.7) with 113 deaths recorded among 316 patients at risk. Survival progressively declined over time, reaching 57.8% at 24 months and 52.4% at 36 months. By the end of the 5-year follow-up period (60 months), the estimated overall survival was 46.2% (95% CI: 41.7–51.2). These findings indicate a gradual reduction in survival probability with increasing duration of follow-up among children diagnosed with leukemia.

Table-7: Overall Survival Probability of the Pediatrics Leukaemia Cohort at Different Follow-up Intervals

Variables	Time (months)	Number at risk	Deaths	Survival	95% confidence interval	
					Lower	Upper
Overall Survival	6	316	113	73.3	69.3	77.7
	12	285	30	66.3	61.9	70.9
	18	267	18	62.0	57.6	66.8
	24	247	18	57.8	53.3	62.7
	30	239	10	55.4	50.9	60.4
	36	223	13	52.4	47.8	57.3
	42	217	7	50.7	46.2	55.7
	48	207	8	48.8	44.3	53.8
	54	200	7	47.2	42.6	52.2
	60	196	4	46.2	41.7	51.2

Table-8 presents the results of the regression analysis evaluating factors associated with survival. In the univariate analysis, age group, gender, and state of residence were not significantly associated with mortality risk. However, leukaemia morphology showed a statistically significant association with survival outcomes. AML demonstrating higher odds of death compared to CML (OR= 4.84; 95% CI: 1.22-7.77, p < 0.05). In the multivariate analysis, patients with AML demonstrated a significantly higher risk of mortality compared with those with CML (AOR= 4.56; 95% CI: 1.67-12.46, P <0.003). Similarly, patients with ALL also showed increased risk relative to CML, indicating that leukaemia subtype is an important independent predictor of survival in this cohort. Overall, ALL has slightly better prognosis in comparison with AML.

Table-8: Univariate & Multivariate Analysis of Factors Associated with Survival

Variable	Univariate						Multivariate				
	Predictor	Z	P	Odds ratio	95% confidence interval†		Z	P	Odds ratio	95% confidence interval†	
					Lower	Upper				Lower	Upper
5 years age group	0-4	-	-	1	-	-	-	-	-	-	-
	05-09	0.293	0.769	1.079	0.649	1.795	-	-	-	-	-
	10-14	1.348	0.178	1.462	0.842	2.539	-	-	-	-	-
	15-19	0.791	0.429	1.26	0.711	2.234	-	-	-	-	-
Gender	Female	-	-	1	-	-	-	-	-	-	-
	Male	0.135	0.893	1.029	-	-	-	-	-	-	-
State	Gujarat	-	-	1	-	-	-	-	-	-	-
	Outside	0.651	0.515	1.166	0.681	1.554	-	-	-	-	-
Morphology	CML	-	-	1	-	-					
	ALL	2.392	0.017*	3.087	0.735	1.851	1.23	0.027**	2.78	1.121	6.87
	AML	3.05	0.002*	4.844	1.226	7.772	2.96	0.003**	4.56	1.67	12.46

*P value obtained from Bivariate analysis significant at $p<0.05$, † 95% CI= 95% Confidence Interval
**P value obtained from Logistic regression analysis, statistically significant at $p<0.05$

DISCUSSION

This retrospective cohort study evaluated epidemiological characteristics and survival outcomes among 424 pediatric leukemia patients (aged 0-18 years) treated at a tertiary cancer center in Western India, revealing ALL predominance (77.4%), mean overall survival of approximately 37.5 months, and subtype-specific Kaplan-Meier estimates (e.g., 46.2% at 60 months overall, with CML showing superior prognosis). These findings provide valuable real-world evidence regarding survival patterns and disease distribution among pediatric leukemia patients treated in a tertiary cancer center and highlight the continued disparities in survival outcomes between leukemia subtypes in resource-constrained settings.

In the present study the mean overall survival was 46.2%. Global evidence demonstrates substantial disparities in childhood cancer survival between high-income and low- and middle-income countries (LMICs). The CONCORD-3 study reported survival rates exceeding 80% for childhood leukemia in many high-income settings, whereas considerably lower survival has been observed in resource-limited regions. This difference may reflect challenges such as delayed diagnosis, treatment interruptions, infection-related complications, and limited access to specialized pediatric oncology care in LMIC settings.[6] Likewise, previous Indian studies have reported overall survival for pediatric leukemia ranging between 45% and 81%, reflecting substantial variability across treatment centers. A review of national data by Rajat S. Arora and Brijesh Arora documented survival outcomes within this range in Indian tertiary care settings. [5] Comparable findings have also been reported from tertiary oncology centers in India. In a cohort of 65 children with acute myeloid leukemia, Kaplan–Meier survival analysis demonstrated a median overall survival of 14.6 months and a median event-free survival of 12.6 months, with early mortality largely attributable to severe infections and treatment-related toxicities. These findings underscore the significant impact of treatment-related complications and supportive care limitations on survival outcomes in pediatric leukemia patients treated in resource-limited settings. [8]

Acute lymphoblastic leukemia (ALL) dominated the cohort at 77.4%, followed by AML (17%) and CML (5.7%), consistent with national hospital-based registries reporting leukemia as 30-40% of pediatric malignancies in India. [9] The GLOBOCAN 2022 report indicates that leukemia accounts for the highest age-standardized incidence and mortality rates among childhood cancers globally.[10] Geographic concentration from Gujarat districts (75%) reflects GCRI's referral role, mirroring patterns in other regional cohorts where local residency aids early presentation.

In the present study, the five-year survival analysis showed that 70.83% of patients with CML survived, indicating a comparatively better survival outcome than those diagnosed

with ALL and AML within the study cohort. Similarly, registry data from Japan demonstrated that the five-year overall survival for CML exceeded 90%, representing the most pronounced improvement compared with other leukemia subtypes such as AML. [11] This aligns with a study conducted in Ahmedabad recently state that although CML represents a relatively rare form of childhood leukemia, accounting for approximately 3–5% of pediatric cases, treatment with targeted therapies has led to substantial improvements in survival outcomes.[12]

In the present study, patients with AML demonstrated a significantly higher risk of mortality (AOR= 4.56; 95%CI: 1.67-12.46, P <0.003). Similarly, study conducted in Iran found AML continues to demonstrate relatively poorer survival outcomes in children because of higher relapse rates and treatment-related complications compared with other leukemia subtypes, with a reported hazard ratio of 1.1; (95% CI: 0.1 to 13.9). [13] The findings of the present study are consistent with results reported from a study conducted in Turkey and a recent Indian systematic review, both of which also documented poorer survival outcomes among pediatric patients diagnosed with AML compared with other leukemia subtypes. [14,15]

Strengths and Limitations

The present study has several strengths and limitations. A key strength is the relatively large cohort of pediatric leukemia patients (n=424) derived from a tertiary care cancer center, providing valuable real-world evidence on epidemiological characteristics and survival outcomes. The inclusion of active follow-up through telephonic contact with caregivers helped improve ascertainment of survival status. However, the retrospective design relied on existing hospital records, which may have limited availability of certain clinical or socioeconomic variables. In addition, the single-center nature of the study may restrict generalizability of the findings to other healthcare settings.

CONCLUSIONS

This retrospective cohort study provides important insights into the epidemiological characteristics and survival outcomes of pediatric leukemia patients treated at a tertiary cancer center in Western India. Acute lymphoblastic leukemia was the predominant subtype, accounting for more than three-quarters of all cases. The overall survival proportion observed in the present cohort remains lower than that reported in high-income countries, reflecting persistent disparities in pediatric oncology outcomes in low- and middle-income settings. Survival analysis demonstrated significant differences across leukemia subtypes, with patients diagnosed with acute myeloid leukemia experiencing a substantially higher risk of mortality compared with those with chronic myeloid leukemia. These findings highlight the need for strengthened pediatric oncology services, improved supportive care, and early diagnosis strategies to enhance survival outcomes. Hospital-based survival studies such as the present investigation provide valuable real-world evidence that can inform clinical practice and guide public health policies aimed at improving childhood cancer care in India.

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