ASSOCIATION OF NUTRITIONAL STATUS OF PEDIATRIC PATIENTS DIAGNOSED WITH ACUTE LEUKEMIA AND OUTCOME OF INDUCTION CHEMOTHERAPY IN A TERTIARY HOSPITAL

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BACKGROUND

Acute Lymphoblastic Leukemia (ALL) comprises the majority of childhood leukemias. In the Philippines, the 5-year survival rate of Metro Manila children with ALL was 34%, compared to Asian American (87%) and Caucasian children (86%) in the United States. Patients from developing countries were seen to have a higher risk of infection, undernutrition, and poorer compliance to therapy. These aspects need to be the cornerstone of supportive care for patients with leukemia (Tandon, et.al., 2015). Malnutrition, especially in a child with leukemia, has been shown to complicate the course of treatment (Viana, et. al., 1994). Published data in the Philippines is still very much in want with regards to nutritional data on childhood leukemia.

OBJECTIVE

This study aimed to determine the association of nutritional status and outcome of induction chemotherapy among pediatric leukemia patients in a tertiary hospital in Quezon City

METHODOLOGY

This retrospective cohort study evaluated the association of nutritional status with outcome of induction chemotherapy in acute leukemia patients aged ≤19 years old at National Children's Hospital. Univariate and multivariate logistic regression associated nutritional status with outcome and with significance level set at a p value of ≤0.05.

Inclusion Criteria	Exclusion Criteria
All newly-diagnosed cases of leukemia in patients less than 19 years old	Comorbidities that require treatment with steroids or chemotherapeutic agents
Admitted at NCH from 2011 to 2019	Concomitant endocrinopathies or metabolic diseases
Started induction phase of chemotherapy at NCH. They were diagnosed by: • Bone Marrow Aspiration smears • Bone Marrow Biopsy • Leukemia Panels	CNS involvement upon diagnosis

RESULTS

Of 239 newly diagnosed pediatric leukemia patients, 176 (73.6%) were aged 1 to 10 years old, 151(63.2%) were males, 116 (48.5%) had wasting, stunting or concurrent wasting and stunting. 157 (65.7%) completed the induction phase of chemotherapy. Mortality rate was 18.4%.The odds of mortality among those with malnutrition were 2.29 times higher (95% CI 1.13 - 4.66) than those without malnutrition.

TABLE 1. CLINICAL DEMOGRAPHIC PROFILE, NUTRITIONAL STATUS, AND OUTCOME OF PEDIATRIC LEUKEMIA PATIENTS

Profile, n = 239	N (%)
Age (y)	
1	4 (1.7)
1 to 10	176 (73.6)
>10	59 (24.7)
Sex	
Male	151(63.2)
Female	88 (36.8)
Locality	
NCR	101 (42.3)
Non-NCR	138 (57.7)
Leukemia Type	
ALL	200 (83.7)
AML	29 (12.1)
Others	10 (4.2)
WBC Count (/mm3)	
<50,000	164 (68.6)
>/=50,000	75 (31.4)

Profile, n = 239	N (%)
Degree of wasting	
No wasting	163 (68.2)
Wasted	39 (16.3)
Severely wasted	30 (12.6)
Overweight	7 (2.9)
Degree of Stunting	
No stunting	166 (69.5)
Stunted	45 (18.8)
Severely stunted	28 (11.7)
Nutritional Status	
Normal	123 (51.5)
Malnourished	116 (48.5)
Total	**239 (100)**
Clinical Outcome	
Mortality and Treatment Completion, n = 239	
Completed	157 (65.7)
Not completed	38 (19.4)
Died	44 (18.4)
Remission, N=157	
With Remission	131 (83.4)
No Remission	26 (16.6)

TABLE 2. MORTALITY OUTCOME OF PEDIATRIC LEUKEMIA PATIENTS BY NUTRITIONAL STATUS

Nutritional Status, n=239	Mortality		Total
	Alive n (%)	Died n (%)	n (%)
Normal	100 (86.2)	16 (13.8)	116 (100)
Malnourished	95 (77.2)	28 (22.8)	123 (100)
Total	195 (81.6)	44 (18.4)	239 (100)

TABLE 3. MULTIVARIATE ANALYSIS OF THE FACTORS AFFECTING MORTALITY AMONG PEDIATRIC LEUKEMIA PATIENTS

Factors	Adjusted Odds Ratio		p-value
	Estimate	95% Confidence Interval	
Sex (Male: Female)	0.85	0.42 – 1.74	0.663
Locality (NCR: Non-NCR)	1.35	0.67 – 2.72	0.518
WBC (Less than 50: Above 50)	0.36	0.16 – 0.64	0.005
Age group (Up to 10: Above 10)	0.63	0.29 – 1.35	0.233
Nutritional Status (Malnourished:Normal)	2.29	1.13 – 4.66	0.02

CONCLUSION

There is a high prevalence of malnutrition in pediatric patients with acute leukemia undergoing induction phase of chemotherapy. Malnutrition is associated with a significantly higher likelihood of mortality.

RECOMMENDATION

Nutritional assessment and intervention in all pediatric leukemia patients even in the earliest stages of chemotherapy is vital. A study to include more recent years and of a wider range may be more reflective of current nutritional status and outcome of chemotherapy. Utilization of more suitable nutritional status assessment (MUAC and TSFT) for pediatric leukemia patients may yield more significant associations and conclusions.

REFERRENCES

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