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CLINICOPATHOLOGICAL CHARACTERISTICS AND OUTCOMES OF PEDIATRIC ACUTE LYMPHOBLASTIC LEUKEMIA IN ARMENIA

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INTRODUCTION

Acute lymphoblastic leukemia (ALL) is the most common childhood malignancy globally, requiring intensive multiagent treatment [1]. Prognosis has improved significantly over the last 50 years, with current remission rates in high-income countries over 90%, attributed to the implementation and progressive strengthening of modern treatment protocols and prognostic markers [2 3]. However, in developing countries, challenges such as social factors, economic limitations, inadequate access to supportive care, and genetic variability contribute to a less favourable perspective [4 5].

AIM

This study aims to provide comprehensive insights into the demographic characteristics, clinicopathological features and survival rates of pediatric ALL patients in Armenia.

METHOD

A retrospective analysis was conducted on pediatric patients diagnosed with ALL between January 2020 and December 2022 at the Pediatric Cancer and Blood Disorders of Armenia. This institution is the sole provider of diagnostics and treatment for pediatric ALL in Armenia, making it the primary source for data collection. Data were gathered from the medical records. The analysis focused on clinicopathological characteristics and outcomes of pediatric patients diagnosed with ALL. Statistical analysis was performed using IBM SPSS version 23 software.

RESULTS

The study in Armenia identified 83 cases of ALL, with an incidence rate of 4.03 per 100,000 children. The median age at diagnosis was 5.4 years, including 2.4% of infant leukemias (1.2% congenital). The male-to-female ratio was 1.3:1. Treatment was provided to 79 patients based on the ALLIC-BFM 2009 protocol, with a 2.4% abandonment rate. B-cell-precursor ALL accounted for 86.6% of cases, while T-cell-precursor ALL accounted for 13.4%. CNS involvement was observed in 3.6% of cases. Risk classification showed 39.2% as high-risk, 57% as intermediate-risk, and 3.8% as standard-risk. Common cytogenetic abnormalities were detected, including P16 gene deletion in 21%, IGH gene rearrangement in 18.5%, t(12;21)(q34;q22)TEL/AML1 in 14.8%, MLL gene rearrangement in 6.2%, cMYC gene rearrangement in 2.4%, and P53 gene deletion in 1.2% of cases. Philadelphia chromosome positivity was observed in 1.2% of cases. The poor response rate to prednisolone was 12.3%. On day 15, 31.0% of cases had the minimal residual disease (MRD) >10% in the bone marrow, and 23.4% experienced induction failure. Bone marrow transplant (BMT) eligibility was determined in 6.1% of the primary cases. The disease-specific mortality rate was 10%, with an induction mortality rate of 2.4%.

CONCLUSIONS

This retrospective analysis contributes to the understanding of pediatric ALL in Armenia, providing valuable data for future research, treatment optimization, and the development of targeted interventions to improve the prognosis and quality of life for pediatric ALL patients in the country.

REFERENCES

1. Inaba H, Greaves M, Mullighan CG. Acute lymphoblastic leukemia. Lancet. 2013;381(9881):1943-1955.

2. Irving J, Jesson J, Virgo P, et al. Establishment, and validation of a standard protocol for the detection of minimal residual disease in B lineage childhood acute lymphoblastic leukemia by flow cytometry in a multi-center setting. Haematologica. 2009;94(6):870- 874.

3. Pui CH, Yang JJ, Hunger SP, et al. Childhood acute lymphoblastic leukemia: Progress through collaboration. J Clin Oncol. 2015;33(27):2938-2948.

4. Sitaresmi MN, Mostert S, Schook RM, Sutaryo, Veerman AJP. Treatment refusal and abandonment in childhood acute lymphoblastic leukemia in Indonesia: An analysis of causes and consequences. Psychooncology. 2010;19(4):361-367.

5. Kulkarni KP, Arora RS, Marwaha RK. Survival outcome of childhood acute lymphoblastic leukemia in India: a resource-limited perspective of more than 40 years. J Pediatr Hematol Oncol. 2011; 33(6): 475- 479.

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