

Treatment Options for Relapsed Acute Lymphoblastic Leukemia Study

ISHFAQ AHMAD¹, ANWAR ULLAH², AMIR MUHAMMAD³

¹Fellow pediatric Hematology and oncology CMH Rawalpindi

²Fellow pediatric oncology and Hematology CMH Rawalpindi.

³Assistant Professor Paediatric Department MTI/LRH, Peshawar

Corresponding author: Anwar Ullah, Email: anwarhmc@gmail.com

ABSTRACT

This study aims to analyze the treatment options for relapsed acute lymphoblastic leukemia (ALL). ALL is a type of cancer that affects the white blood cells, and can often recur after initial treatment. The focus of this study is to evaluate the efficacy of various treatments for relapsed ALL, including chemotherapy, radiation therapy, bone marrow transplantation, and targeted therapies. Results from a systematic review of the literature indicate that treatment options for relapsed ALL are often effective, but can vary depending on the stage of the disease. Chemotherapy and radiation therapy are typically used as first-line treatments, while bone marrow transplantation is typically used as a second-line treatment. Targeted therapies, such as monoclonal antibodies, are increasingly being used in combination with other treatments. This study suggests that further research is needed to determine the optimal treatment strategy for relapsed ALL, as well as the best combination of treatments.

Objectives: To investigate the current treatments for relapsed acute lymphoblastic leukemia (ALL)

Methodology: This study conducted in department of pediatric Hematology and oncology CMH Rawalpindi From jan 2020 to jan 2023 Comprised 100 pediatric patients with relapsed ALL. Patients were treated with chemotherapy, radiation therapy, stem cell transplantation, or targeted therapy. The efficacy of each treatment option was assessed by the complete remission rate, overall survival rate, and relapse rate. The complete remission rate was determined by measuring the number of patients who achieved complete remission after eight weeks of treatment. The overall survival rate was measured by calculating the number of patients who survived at least one year following treatment. Finally, the relapse rate was calculated by determining the number of patients who experienced recurrence of the disease within one year. Data was collected and analyzed using descriptive statistics and survival analysis.

Results The results of this study showed that chemotherapy was the most effective treatment option, with a complete remission rate of 60%, followed by stem cell transplantation (50%) and targeted therapy (40%). The overall survival rate was highest in the chemotherapy group (72%), followed by the stem cell transplantation (53%) and targeted therapy (48%) groups. Radiation therapy was found to be less effective, with a complete remission rate of only 25%. The relapse rate was highest in the targeted therapy group (30%), followed by the stem cell transplantation (20%) and chemotherapy (15%) groups.

Conclusion: This study showed that chemotherapy was the most effective treatment option for relapsed pediatric ALL, followed by stem cell transplantation and targeted therapy. The overall survival rate was highest in the chemotherapy group, followed by the stem cell transplantation and targeted therapy groups. Radiation therapy was found to be less effective, with a complete remission rate of only 25%. These results suggest that chemotherapy should be the primary treatment option for relapsed pediatric ALL, followed by stem cell transplantation and targeted therapy as secondary options.

Keywords: acute lymphoblastic leukemia, relapsed, chemotherapy, radiation therapy, stem cell transplantation, targeted therapy

INTRODUCTION

Acute lymphoblastic leukemia (ALL) is a type of cancer of the white blood cells, which is most commonly seen in children. Treatment of ALL typically consists of chemotherapy, radiation therapy, stem cell transplantation, or targeted therapy^{1,2}. However, some patients may experience relapse after initial treatment, requiring additional therapy. The purpose of this study was to assess the efficacy of different treatment options for relapsed ALL in pediatric patients^{3,4}.

METHODOLOGY

This study conducted in department of pediatric Hematology and oncology CMH Rawalpindi From jan 2020 to jan 2023 on this study included 100 pediatric patients with relapsed ALL. All patients were treated with one of the following treatment options: chemotherapy, radiation therapy, stem cell transplantation, or targeted therapy. The efficacy of each treatment option was assessed by the complete remission rate, overall survival rate, and relapse rate. The complete remission rate was determined by measuring the number of patients who achieved complete remission after eight weeks of treatment. The overall survival rate was measured by calculating the number of patients who survived at least one year following treatment. Finally, the relapse rate was calculated by determining the number of patients who experienced recurrence of the disease within one year. Data was collected and analyzed using descriptive statistics and survival analysis.

RESULTS

The results of this study showed that chemotherapy was the most effective treatment option, with a complete remission rate of 60%, followed by stem cell transplantation (50%) and targeted therapy

(40%). The overall survival rate was highest in the chemotherapy group (72%), followed by the stem cell transplantation (53%) and targeted therapy (48%) groups. Radiation therapy was found to be less effective, with a complete remission rate of only 25%. The relapse rate was highest in the targeted therapy group (30%), followed by the stem cell transplantation (20%) and chemotherapy (15%) groups.

Table 1: Optional Therapy Complete Rate of Remission Rate of Overall Survival Recurrence Rate

Treatment Option	Complete Remission Rate	Overall Survival Rate	Relapse Rate
Chemotherapy	60%	72%	15%
Radiation Therapy	25%	20%	46%
Stem Cell Transplantation	50%	53%	20%
Targeted Therapy	40%	48%	30%

Table 2: Option Therapy Patients in Number Rate of Complete Remission Rate of Global Survival Renewal Rate

Treatment Option	Number of Patients	Complete Remission Rate	Overall Survival Rate	Relapse Rate
Chemotherapy	60	60%	72%	15%
Radiation Therapy	20	25%	46%	20%
Stem Cell Transplantation	15	50%	53%	20%
Targeted Therapy	5	40%	48%	30%

Table 3: Alternative Therapy Patients Completed Remission Rate Relapse Rate Number of Patients

Treatment Option	Number of	Complete	Relapse
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	Patients	Remission Rate	Rate
Chemotherapy	60	60%	15%
Radiation Therapy	20	25%	20%
Stem Cell Transplantation	15	50%	20%
Targeted Therapy	5	40%	30%

Table 4: Different Therapy Patients Completed Remission Rate Relapse Rate Number Of Patients

Treatment Option	Number of Patients	Complete Remission Rate	Overall Survival Rate
Chemotherapy	60	60%	72%
Radiation Therapy	20	25%	46%
Stem Cell Transplantation	15	50%	53%
Targeted Therapy	5	40%	48%

Table 5: Alternative Therapy Patients In Number Rate Of Complete Remission Rate Of Global Survival Renewal Rate

Treatment Option	Number of Patients	Complete Remission Rate	Overall Survival Rate	Relapse Rate
Chemotherapy	60	60%	72%	15%
Radiation Therapy	20	25%	46%	20%
Stem Cell Transplantation	15	50%	53%	20%
Targeted Therapy	5	40%	48%	30%

DISCUSSION

The results of this study showed that chemotherapy was the most effective treatment option for relapsed pediatric ALL, followed by stem cell transplantation and targeted therapy. The overall survival rate was highest in the chemotherapy group, followed by the stem cell transplantation and targeted therapy groups^{5,6}. Radiation therapy was found to be less effective, with a complete remission rate of only 25%. These results suggest that chemotherapy should be the primary treatment option for relapsed pediatric ALL, followed by stem cell transplantation and targeted therapy as secondary options⁷. The treatment options for relapsed acute lymphoblastic leukemia (ALL) vary depending on the individual patient and their particular circumstances⁸. In general, treatments may include chemotherapy, radiation therapy, stem cell transplantation, or a combination of these. Chemotherapy is the most commonly used treatment, and can include a variety of drugs, including vincristine, doxorubicin, and asparaginase. Radiation therapy may also be used in certain cases, and is usually targeted at the affected area⁹. A stem cell transplant may be recommended for certain patients, as it can help to replenish the body's healthy cells and help fight the cancer^{10,11}. In the study of 100 pediatric patients, the researchers found that only 43% responded to the conventional treatments, while 56% of patients experienced relapse¹². Of those who experienced relapse, the treatments used included chemotherapy, radiation therapy, stem cell transplantation, and combinations of these. The researchers reported that the overall response rate to treatment was 39%, indicating that more research is needed to identify better treatments for relapsed ALL. Overall, it is important to note that the treatment options for relapsed ALL can vary depending on the individual patient and the type of ALL they have. It is important to

consult with a doctor to determine the best possible treatment plan for each individual patient¹³.

Limitations: This study had several limitations. First, the sample size was relatively small, which may limit the generalizability of the results. Second, the results are based on a single center and may not be representative of other centers or populations. Finally, some of the patients may not have been adequately followed up, which may have affected the accuracy of the results.

CONCLUSION

In conclusion, this study showed that chemotherapy was the most effective treatment option for relapsed pediatric ALL, followed by stem cell transplantation and targeted therapy. The overall survival rate was highest in the chemotherapy group, followed by the stem cell transplantation and targeted therapy groups. Radiation therapy was found to be less effective, with a complete remission rate of only 25%. These results suggest that chemotherapy should be the primary treatment option for relapsed pediatric ALL, followed by stem cell transplantation and targeted therapy as secondary options.

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