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The Result of Post Chemotherapy Bone Marrow Recovery in Patients With Acute Leukemia and Lymphoid Malignancies

Elbegjargal.E [1], Oyundelger.N [1], Khishigjargal.B [1], Myadagsuren.S [1], Nansalmaa.A [1], Bulgan.D [1], Altanshagai.B [1], Baljinnyam.P [1], Chinbat.G [1], Otgonbat.A [2]

1. Hematology and Bone Marrow Transplantation Center of First Central Hospital of Mongolia
2. Mongolian National University of Medical Sciences, Ulaanbaatar, Mongolia

THE FIRST CENTRAL HOSPITAL OF MONGOLIA 1925

INTRODUCTION

Post-chemotherapy bone marrow recovery with leukemia patients is defined by increasing absolute neutrophil counts and platelet counts in the complete blood count (CBC). Recent studies have shown that IFR, a new routine and more sensitive parameter compared to others, can give the idea of the earliest morphologic change of bone marrow recovery after chemotherapy. During the period of marrow suppression, extensive monitoring of blood counts is required to assess hemopoietic recovery.

AIM

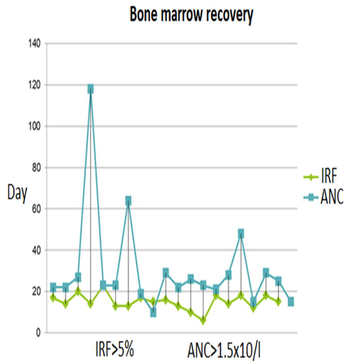
This study aims to evaluate post-chemotherapy and post-stem cell transplantation bone marrow recovery with patients with hematological malignancies by immature reticulocyte fraction and compare results with an absolute neutrophil count.

METHOD

The study was conducted using an observational cross-sectional and prospective cohort study based on clinical cases from January 2022 to February 2023 and involved twenty patients who underwent chemotherapy for acute leukemia and auto transplantation due to lymphoid malignancies. Before and post-chemotherapy, in the CBC, the immature reticulocyte fraction (IRF) was compared with the absolute neutrophil count (ANC) using the "Sysmex XN 2000" analyzer to determine the bone marrow recovery. Statistical analysis was performed using the Stata 12.0, and Paired t-test was used.

RESULTS

Before polychemotherapy, IRF was 14.48 ± 8.6%, ANC 4.4 ± 6.05x109/l; on the first day after polychemotherapy, IRF was 1.78 ± 2.9%, and ANC was 0.92 ±1.73x109/l respectively. Figure 1. The participant's bone marrow recovery days were calculated as IRF ≥ 5% and ANC ≥1.5 x 10^9/L in peripheral blood. The mean bone marrow recovery days were 15.15 ± 3.68 (CI [13.4; 16.8]) for IRF, and 30.45 ± 23.69 for ANC (CI [19.3; 41.5]), p=0.001, Figure 1. showing earlier IRF recovery by an average of 15 days. In 85% of all cases, IRF has indicated the earliest parameter of bone marrow recovery compared to ANC.



	Average value of before treatment	First day average value of after treatment	Days of bone marrow recovery	Range
IRF	14.4 ± 8.6%	1.7 ± 2.9%	15.5 ± 3.6	6-23 days
ANC	4.4 ± 6.05 x10^9/l	0.92 ± 1.7x10^9/l	30.45 ± 23.6	10-118 days

Figure 1. Comparison of Bone marrow recovery by average IRF abd ANC values

CONCLUSIONS

1. IRF can serve as an additional reliable parameter in patients who require an assessment of post-chemotherapy bone marrow recovery.

2. IRF can predict bone marrow recovery earlier than ANC count.

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CONTACT INFORMATION

Hematology and BMT center of First Central Hospital of Mongolia, Ulaanbaatar 210648, Mongolia

Lecturer Department of Hematology, School of Medicine. Mongolian National University of Medical Sciences, Zorig street, Ulaanbaatar 14210, Mongolia