The Prognostic Value of the Endothelial Activation and Stress Index (EASIX) Score, Platelet-to-Lymphocyte Ratio (PLR), and Neutrophil-to-Lymphocyte (NLR) in Myelodysplastic Syndrome Patients in Jordan after Adjusting for IPSS-R Risk Groups

Jawad Alrawabdeh[1], Marah Alzu'bi [1], Yazan Hamadneh [1], Nada Odeh [1], Montaser Alzyoud [1], Abdalla Awidi MD[1,2,3], Ahmad Magableh MD[3], Alaa Alshorman MD[3], Feras Al-Fararjeh MD[3], Tariq Aladily MD[3], Amer Zeidan MD[4], Hisham Bawa'neh MD[5]

[1]University of Jordan, Amman, Jordan, [2]Cell Therapy Center, University of Jordan, Amman, Jordan, [3]Jordan University Hospital, Amman, Jordan, [4]Yale Cancer Center and Smilow Cancer Hospital, New Haven, USA, [5]Al Basheer Hospital, Amman, Jordan

Abstract

To improve the prognostic ability of IPSS-R, we tested to see if adding the EASIX score, Neutrophil-Lymphocyte Ratio (NLR), or Platelet-Lymphocyte Ratio (PLR) along with IPSS-R improves prognostic accuracy of MDS and MDS/MPN patients. EASIX is an easy to calculate clinical biomarker calculated using LDH, creatinine, and platelets. Our study was done on a sample of 112 MDS and MDS/MPN patients at a tertiary university hospital in Jordan.. We show that an EASIX score higher than 1.72 is a significant predictor of mortality after adjusting for IPSS-R, gender, and bone marrow blasts (p = 0.037). PLR and NLR were not significant.

Background

Many prognostic scoring systems are used for MDS patients, with the most popular being the Revised International Prognostic Scoring System (IPSS-R) (1). Recently, another scoring system that included molecular parameters was published called the Molecular International Prognostic Scoring System (IPSS-M) (2). However, in many countries molecular data for individual patients is still far away from current clinical practice. We aimed to improve the prognostic capabilities of the IPSS-R using simple to calculate clinical biomarkers, such as the Endothelial Activation and Stress Index (EASIX) score, PLR, and NLR. EASIX calculated by multiplying LDH with creatinine and dividing by platelets.

Objective

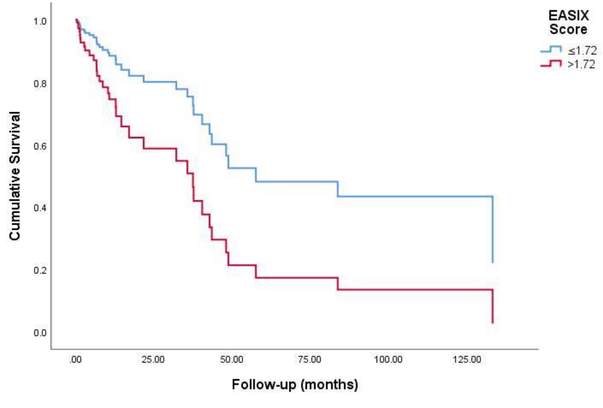
To determine the prognostic value of Endothelial Activation and Stress Index (EASIX) score, Neutrophil-Lymphocyte Ratio (NLR), and Platelet-Lymphocyte Ratio (PLR) measured at diagnosis in the prognosis of MDS patients after adjusting for IPSS-R scores.

Materials & Methods

This is an observational study in which registry data was collected prospectively between January 2007 and September 2021. The data were reviewed and analyzed retrospectively. The patients recruited in this study were followed up for an average of 3.59 years. The data collection procedure took place at Jordan University Hospital; one of the biggest referral centers for MDS patients in Amman, Jordan.

Results

There were 112 MDS and MDS/MPN patients recorded. The male to female ratio was 1.196. The median age at diagnosis was 59 years for the whole group. The X-Tile bioinformatics tool was used to calculate optimal cut-off points for each score. PLR and NLR were not significant after adjusting for IPSS-R in a multivariable cox regression model. The optimal cut-off for EASIX was 1.72. The EASIX score was significant (p= 0.037) after adjusting for IPSS-R, gender, and bone marrow blasts. patients with EASIX scores higher than 1.72 were more likely to have 'high' and 'very high' IPSS-R risk groups (p < 0.05).



Multivariable cox regression model (p < 0.05) of MDS patients based on the EASIX score

Summary

The data of 112 MDS and MDS-MPN patients were included in this study. Three scores were tested in an attempt to improve the prognostic ability of the IPSS-R for MDS patients, the Endothelial Activation and Stress Index (EASIX) score, Neutrophil-Lymphocyte Ratio (NLR), and Platelet-Lymphocyte Ratio (PLR). PLR and NLR scores did not significantly improve prognosis. The EASIX score with a cut-off point of 1.72 improved prognosis after adjusting for IPSS-R, gender, and bone marrow blasts.

Discussion

In conclusion, EASIX was found to be an independent predictor of survival in patients with MDS, unlike NLR and PLR. With that being said, EASIX scores should be utilized to help accurately estimate the prognosis of MDS patients early in the course of the disease. These findings need to be further explored and investigated in future studies with a larger number of patients, and in patients in different countries.

References

1. Assessing the Prognosis of Patients with Myelodysplastic Syndromes (MDS), *Cancers*
2. Molecular International Prognostic Scoring System for Myelodysplastic Syndromes, *Nejm Evidence*