IMMATURE PLATELET FRACTION AS A BIOMARKER OF SEPSIS IN ACUTE MYELOID LEUKEMIA PATIENTS RECEIVING CHEMOTHERAPY

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Introduction

Acute myeloid leukemia (AML) is characterized by clonal myeloid precursor proliferation with decreased differentiation into more mature cells which lead to an accumulation of leukemic blasts in the bone marrow, peripheral blood, and occasionally in other tissues and the development of normal red blood cells , platelets and mature granulocytes is decreasing.

Febrile neutropenia is a medical emergency that requires urgent evaluation, the timely administration of empiric broad-spectrum antimicrobials, and careful monitoring to optimize patient outcomes and diminish the risk of complications. A new definition of sepsis, termed (Sepsis-3) as life-threatening organ dysfunction caused by a dysregulated host response to infection.

Recently, non-invasive assessment of platelet turnover has been performed by measuring the immature platelet fraction (IPF). The percentage of reticulated platelets indicates the degree of platelets damage and the generation of platelets in bone marrow.

Aim of the work

To evaluate the immature platelet fraction in acute myeloid leukemia patients receiving chemotherapy as a predictor of onset of sepsis by comparing it to C reactive protein and serum ferritin.

Patients

30 patients diagnosed as AML admitted to the Hematology unit - Internal Medicine department, Alexandria University.

Inclusion criteria

1. Age more than 18 and less than 60 years.
2. Patients who will receive conventional chemotherapy (induction or consolidation)

Exclusion criteria:

1. Age less than 18 and more than 60 years.
2. Patients with co morbidities that make them ineligible for conventional chemotherapy.
3. Pregnant female patient.
4. AML (M3).

Methods

Immature platelet fraction measurement by flow cytometery : Regular blood assessment on days zero and day 22 of chemotherapy and day of on set of fever.

Results

Table (1): Correlation between IPF in day of fever, day 22 and different parameters:

	IPF in day of fever (n = 30)		IPF in day 22 (n = 29)	
	r_s	p	r_s	p
MPV	0.362	0.049*	0.514	0.004*
ALC	-0.052	0.786	-0.230	0.230
Retic count	-0.069	0.718	-0.120	0.534
CRP	0.392	0.032*		
Ferritin	0.159	0.400		
Procalcitonin	0.416	0.022*		
SOFA score	0.481	0.007*		

There was positive significant correlation between IPF level and MPV of the patients of our study in day of fever (rs 0.362, P value 0.049) in day 22 of chemotherapy (rs0.514, P value 0.004).

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There was positive correlation between IPF level and CRP of the patients of our study in day of fever (rs 0.392, P value 0.032)

There was correlation between IPF level and procalcitonin of the patients of our study in day of fever (rs 0.416, P value 0.022)

Table (2): Validity (AUC, sensitivity, specificity) for day of fever of IPF to prognosis positive blood culture (n = 14) from negative (n = 16)

	AUC	p	95% C.I	Cut off#	Sensitivity	Specificity	PPV	NPV
IPF	0.835	0.002*	0.686 – 0.984	>1.1	85.71	68.75	70.6	84.6

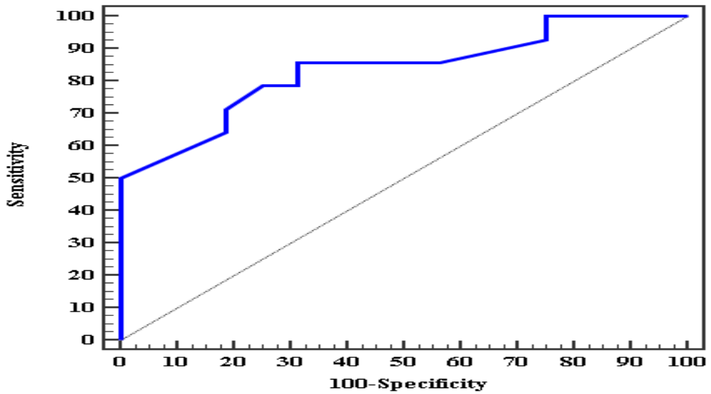

Figure (1) :ROC curve for day of fever of IPF to prognosis positive blood culture (n = 14) from negative (n = 16):

Conclusion

Immature Platelet Fraction As A Biomarker Of Sepsis In Acute Myeloid Leukemia Patients Receiving Chemotherapy in comparison to Crp, Ferritin and Procalcitonin