Cluster of differentiation 97 as a biomarker for detection of Minimal Residual Disease in common Acute Lymphoblastic Leukemia

Laila Sherif, Mervat Azab, Ghada Al-Akad, Marwa Zakaria , Sara Sorour

Zagazig University, Egypt.

Background/objectives

Minimal residual disease (MRD) is gaining importance nowadays both for therapy efficacy, follow up and relapse risk estimation. recent studies have high lightened potential markers that may improve the sensitivity of MRD detection by flowcytometry.CD97 is one of these markers which show over expression in pediatric ALL. In this study we aimed to asses the value of CD97 as biomarker for detection of MRD in pediatric ALL.

Materials and Methods

This cohort study was conducted on thirty newly diagnosed patients with B-lineage ALL. they were 16 males and 14 females with mean age of 8,38±4.21 and a range from(1 -18) year. 20 patients were low risk group and 10 patients were high risk group treated according to modified CCG 1991. a panel of monoclonal antibodies was used with special emphasis on CD10,CD19,CD34 andCD97at diagnosis and at day 14 post induction of chemotherapy for detection of MRD.

Results

Three patients(10%) presented with total leucocytic counts(TLC) ≥50 x10^3/mm^3 while twenty seven patients(90%) had TLC < 50 x10^3/mm^3. Mean multiparameter flow cytometry of CD19/CD97, CD34/CD97 and CD10/CD97 at day 0 was 57.15±21.74, 57.73±21.20 and 57.87±20.77 while at day 14 was 6.09±2.50, 10.67±8.89 and 5.97±2.44 respectively p value<0.001. CD97 was expressed in 81.5% of patients at diagnosis and wasn't detected at day 14 p value <0.001.one patient had blast counts >5% by light microscopy while twenty nine patients had MRD>0.1 by multiparameter flow cytometry at day 14 p valu<0.001.

Studied ALL patients				
Blast%	At day (0)	At day (14)	Test•	P-value
BM (%)				
Mean ± SD	73.29 ± 15.90	1.00 ± 1.46	-4.544	<0.001
Flow cytometry (%)				
Mean ± SD	72.11 ± 11.90	5.68 ± 7.90	-4.541	<0.001
Test	-4.544•	-4.541•		
p-value	<0.001	<0.001		

Studied ALL patients						
	At day (0)		At day (14)		Test§	P-value
	No	%	No	%		
CD97						
Absent	5	18.5%	27	100%	21.04	<0.001
Present	22	81.5%	0	0%	3	

§ McNemar test; p< 0.05 is significant. • Wilcoxon signed ranks test.

Conclusion

CD97 expression in combination with CD 10, CD 19 & CD 34 showed significant correlation with blasts by FCM post induction chemotherapy and it is a good marker for MRD tracing in pediatric ALL.