PROTEIN ARGININE METHYLTRANSFERASE 1 EXPRESSION LEVEL AND ITS PROGNOSTIC SIGNIFICANCE IN ADULT ACUTE MYELOID LEUKEMIA PATIENTS

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Introduction

AML is a haematological malignancy characterized by a wide range of mutated genes and a wide genomic architecture composed of preleukemic and leukemic clones that unfold progressively over time. Protein arginine methylation is a posttranslational modification that is activated by the PRMT family of which PRMT1 is the most predominant isoform. PRMT1 was reported to be upregulated in breast cancer, lung cancer and colon cancer and to promote the proliferation and transformation of cancer cells. While the detailed function of PRMT1 in adult hematopoietic stem and progenitor cells (HSPCs) self-renewal and differentiation is still largely unknown, the role of PRMT1 in normal adult hematopoiesis has recently been identified.

Aim of the Work

To evaluate the impact of the PRMT1 on response to induction chemotherapy in adult Egyptian AML patients.

Patients and Methods

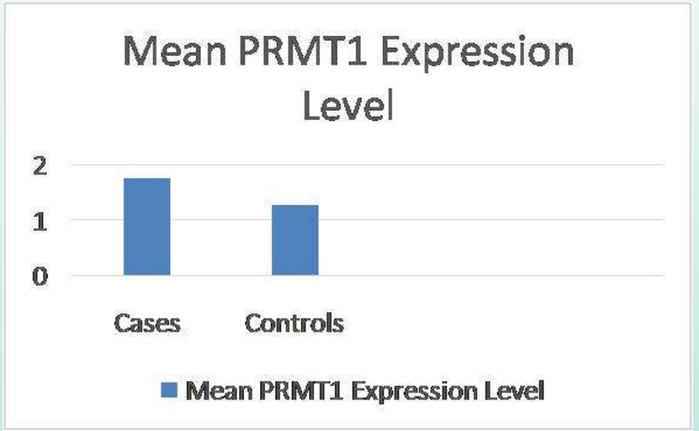
The presented study was conducted on 40 newly diagnosed AML patients in Alexandria University Main Hospital, Internal Medicine Department, Haematology Unit, from the period of December 2020 to August 2021. All of our patients were tested for PRMT1 gene expression level in bone marrow aspirate samples at time of initial diagnosis, as well as 20 healthy control subjects. Patients received standard [7+3] AML induction chemotherapy and follow up BMA assessment was done at day 28, assessing response to induction.

Results

Table : Correlation between PRMT1 expression level and response, relapse free survival and overall survival in AML cases (n =40)

	No.	PRMT1		U	P
		Mean±SD.	Median (Min.–Max.)		
Response					
Favourable	15	1.03±0.80	0.83(0.18-3.34)	113.0*	0.038*
Unfavourable	25	2.20±2.10	1.35(0.22-9.18)		
Relapse free survival$					
No Relapse	9	1.15±0.90	1.03(0.18-3.34)	21.50	0.529
Relapse	6	0.85±0.65	0.58(0.27-1.69)		
Overall Survival$					
Alive	9	1.15+0.90	1.03(0.18-3.34)	21.50	0.529
Died	6	0.85+0.65	0.58(0.27-1.69)		

SD: Standard deviation
U: Mann Whitney test
P: p value for comparing between different categories
*: Statistically significant at $p \leq 0.05$



Conclusion

Patients with a higher PRMT1 gene expression level were significantly less likely to achieve complete remission after standard induction chemotherapy than those with a lower PRMT1 expression level. FLT3 gene mutation positivity had no significant correlation with PRMT1 gene expression levels.