Multi-Drug Resistance P-Glycoprotein and CD34 in Patients With Acute Leukemia

Thesis submitted for the partial fulfillment of M.D. degree in Clinical and Chemical Pathology

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Abstract

This study was conducted on 66 patients presenting with acute leukemia. These patients included 31 ANLL patients, 28 ALL patients and 7 patients with biphenotypic leukemia. The ANLL patients were further classified using cytomorphological and immunophenotypic markers into 7 patients with M0, 2M_1, 10M_2, 6M_3, 4M_4, 1M_5 and 1M_6. ALL patients were classified into 19 pre-B type, 2 B type and 7 T-lineage.

The blast cells separated from BM or peripheral blood samples of these patients were tested for CD_{34} expression using flow cytometry and for MDR-1 P-gp expression using immunocytochemistry.

No difference was noted as regards CD_{34} expression in the three patient groups.

P-gp expression was significantly higher in ANLL than in the other 2 groups.

When assessing the influence of each of P-gp and CD_{34} expression alone and then their combined effect on the clinical outcome of the patients, 1 year after starting chemotherapy, P-gp expression was found to have a highly significant relation with the adverse outcome of patients with acute leukemia in general and ANLL in particular, while only a significant relation was found in ALL group.

CD_{34} was not found to be significantly associated with P-gp expression or with adverse clinical outcome of patients in any group.

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List of Abbreviations

ABR	Abnormally banding region.
ADA	Adenosine deaminase.
AEL	Acute erythroleukemia.
ALL	Acute lymphoblastic leukemia.
AMegL	Acute megakaryoblastic leukemia.
AML	Acute myelocytic leukemia.
AMMoL	Acute myelomonocytic leukemia.
AMoL	Acute monocytic leukemia.
ANLL	Acute non-lymphoblastic leukemia.
APL	Acute promyelocytic leukemia.
Ara-c	Arabinosyl cytoside.
at-MDR	Atypical multidrug resistance.
	Altered topoisomerase
ATP	Adenosine triphosphate.
ATRA	All-trans-retinoic acid
AUL	Acute undifferentiated leukemia
BCP	B-cell precursor
BMT	Bone marrow transplantation.
BSO	Buthionine sulfoximine
CALLA	Common acute lymphoblastic leukemia antigen
CLL	Chronic lymphocytic leukemia
CML	Chronic myelocytic leukemia
CNS	Central nervous system
CR	Complete remission
CSF	Cerebro-spinal fluid
CSF-GM	Colony stimulating factor-granulocyte macrophage
CSFG	Colony stimulating factor-granulocyte
Cy Ig	Cytoplasmic immunoglobulin
DFS	Disease free survival
DIC	Dissiminated intravascular coagulopathy
DM	Double minutes
DNA	Deoxyribonucleic acid
FS	Forward scatter
GAP	GTPase activating protein
GSH	Glutathione
GST	Glutathione S transferase
HDAC	High dose ara-c

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HLA	Human leucocyte antigen
HSR	Homogeneously staining region
IL	Interleukin
inv	Inversion
IRF1	Interferon regulatory factor 1
LRP	Lung resistance protein
MDR	Multidrug resistance
MDS	Myelodysplastic syndrome
MoAbs	Monoclonal antibodies
MRP	Multidrug resistance associated protein
MTs	Metallothioneins
NF1	Neurofibromin 1
P-gp	P-glycoprotein
PAS	Periodic acid schiff
PBS	Phosphate buffer saline
PCR	Polymerase chain reaction
Ph1	Philadelphia chromosome
RT-PCR	Reverse transcriptase-PCR
sIg	Surface immunoglobulin
SS	Side scatter
TCR	T-cell receptor
TdT	Terminal deoxynucleotidyl transferase
WBCs	White blood cells

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