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BAX gene as a novel expressed tumor associated antigen in acute lymphoblastic leukemia

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Background: The response of acute lymphoblastic leukemia (ALL) patients to cytotoxic drugs is markedly variable with unpredicted therapeutic outcome. Therefore, identification of new biomarkers is very crucial to envisage patient response to therapy. Among these possible biomarkers are BCL-2 family genes that are important determinants of chemotherapy-induced apoptosis. *Bax* gene is a pro-apoptotic gene, while *Aven & Survivin* are anti-apoptotic genes that their significance in diagnosis and prognosis of ALL remains a matter of controversy. Therefore, the aim of this study was to assess *Bax, Aven* and *Survivin* gene expression and its prognostic significance as regard overall survival (OS) and disease free survival (DFS) in ALL patients.

Methods: Amongst 57 patients diagnosed with *de novo* ALL, 32 patients were examined for *Bax, Aven* and *Survivin* expression, whereas, 25 patients were examined for *Aven* and *Survivin* expression. Patients were followed up for 15 months to evaluate survival.

Results: *Bax, Aven* and *Survivin* gene expression were positive in 25%, 59.6% and 66.7% of ALL patients respectively. Cumulative overall survival for Bax +ve ALL patients was 25% which was significantly (p=0.001) lower than that of Bax –ve (100%) ALL patients. The overall survival in patients with *Survivin* +ve, *Aven* +ve and –ve *Bax* was 100% that was statistically (p=0.019) higher than all other combination (66.7%). Moreover, disease free survival of the same group (14 patients) versus all other combination (18 patients) was statistically significant (P=0.011).

Conclusions: Whilst *Bax* expression in ALL patients was associated with bad prognosis, its absence showed improved survival, particularly in patients with *Aven* and *Survivin* concomitant expression. We showed that a single biomarker cannot reliably be used to predict response to therapy and it is likely that combination of biomarkers will be necessary to convey better prognostic criteria to ALL patients.

Biography

Amr Mohamed Gawaly is a Lecturer of Internal Medicine Department and Hematology Unit, Faculty of Medicine, Tanta University. He obtained his MBBCH in 2000, Master in Internal Medicine in 2005, and MD in Internal Medicine from Faculty of Medicine, Tanta University in 2011. He has attended several National and International seminars, workshops, and conferences related to stem cells, including stem cell transplantation, hematological disorders, clinical aspects of leukemia and lymphoma, training course for hematology and lymphoma, in Europe and Egypt. He is leading a group working on preclinical and clinical trials on the utility of stem cells in treatment of chronic leg ulcer and chronic leg ischemia.

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