

### **C3. THE ROLE OF FLOWCYTOMETRY IN MONITORING ACUTE MYELOID LEUKEMIA PATIENTS.**

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#### **INTRODUCTION**

The measurement of minimal residual disease, which reflects an assessment of the biology of acute leukemia is a posttreatment prognostic factor and is rapidly moving into the forefront in recent years, although the optimal timing of MRD for risk stratification and therefore treatment will probably be redefined in the near future. Detection of MRD by multiparametric flowcytometry is based on identifying leukemia associated immunophenotypes (LAIP) on the malignant cells. They are absent or extremely rare in healthy peripheral blood or bone marrow cells.

#### **AIM**

The purpose of this work was the study of LAIP and subsequent determination of BMR and evaluation of the prognostic value of BMR in patients with acute myeloid leukemia following induction treatment.

#### **MATERIAL AND METHODS**

The study included 164 adult patients hospitalized at the Clinical Hematology and Marrow Transplantation Unit Targu Mures with acute myeloid leukemia (AML). Immunophenotyping was performed from bone marrow or peripheral blood using 4 colors flowcytometry both at diagnosis and after induction treatment.

#### **RESULTS**

By using a large panel of combinations of monoclonal antibodies, leukemia associated immunophenotype could be detected in 90% of patients with AML. The most common LAIP were aberrant antigen expression (lineage infidelity) and asynchronous antigen expression.

After the 2nd course of induction treatment, out of the 164 cases diagnosed with AML, complete hematologic remission was achieved in 58 cases and incomplete hematologic remission (neutrophil count  $<1,0 \times 10^9/l$  and/or platelets  $<100 \times 10^9/l$ ) in 44 cases. In these cases the presence of MRD in bone marrow samples was studied by immunophenotyping. Minimal residual disease was detected in 29 cases. In univariate analysis the presence BMR after induction treatment had a negative impact on overall survival ( $p < 0.0001$ ). The multivariate analysis showed that the presence of BMR is an independent negative prognostic factor ( $p < 0.0001$ ).

#### **CONCLUSIONS**

Identification of LAIP being present in a significant proportion of cases of acute myeloid leukemia is a feasible approach to detect minimal residual disease. The presence of BMR after induction treatment is an independent prognostic factor in AML and has implications for risk stratification and treatment decision in patients with AML.