AML1/ETO Gene Expression and Prognosis of Acute Myelogenous Leukemia

Fun Kyung Cho, M.D.,¹ Fun Kyung Jung¹, Jeong Yeal Ahn, M.D.,² Sun Young Kyung, M.D.,¹
Ki Tak Ju, M.D.,¹ Soo Mee Bang, M.D.,¹ Yeoh-Hea Seo, M.D.,²
Dong Bok Shin, M.D.,¹, Jae Hoon Lee, M.D.,¹

¹Department of Internal Medicine and ²Department of Clinical Pathology,
Gachon Medical School, Gil Medical Center, Incheon, Korea

Background The t(8;21)(q22;q22) is associated with a relatively good prognosis and, in particular, with a good response to cytosine arabinoside. It is detected in approximately 7% of AML overall and 20% of AML M2 according to the FAB classification. Analysis of t(8;21) positive leukemic blasts has shown characteristic morphological and immunological features. Molecular characterization of the t(8;21) has shown that the breakpoints involve the AML1 gene on chromosome 21q22 and the ETO gene on chromosome 8q22. We studied incidence of AML1/ETO in adult AML, especially FAM-M2 and comparison of morphologic, immunophenotypic and clinical characteristics between positive and negative group of AML1/ETO in AML and analysed correlation of the results with other biological parameters.

Methods From May 1995 to Sep. 2000, fifty-nine patients with AML including twenty-nine AML-M2 were studied. RNA was extracted from leukemic cells and reverse transcriptase mediated PCR (RT-PCR) for AML1/ETO fusion transcripts was done. Chromosome study, immunophenotypic, clinical characteristics were analysed and statistical analysis was done.

Results The incidence of AML1/ETO gene was 22% in AML and 44.8% in AML-M2. The male to female ratio was 32 : 27 in AML and 17 : 12 in AML-M2. The median age was 43(range 14~86)years in AML and 43(range 14~77)years in AML-M2.

The morphologic finding of bone marrow in AML-M2 showed higher incidence of auer rods, large blast with prominent golgi and abnormal granules in AML1/ETO positive patients. There was no significant difference of immunophenotype. AML patients with AML1/ETO rearrangement had a tendency of higher remission rate to chemotherapy(81.8% vs 56.6%, p>0.05).

The overall survival(82.2 weeks vs 34.4 weeks, p=0.01) and progression free survival(51weeks vs 20weeks, p=0.01) in AML1/ETO positive group was longer than in negative group in AML. But there was no significant difference between both group in AML-M2 (OS; 82 weeks vs 16 weeks; p=0.07, PFS; 51 weeks vs 16 weeks; p=0.09).

Conclusion The data suggest that AML1/ETO rearrangement is detected frequently in AML, especially M2 and it is favorable prognostic factor. Thus, molecular diagnostic approaches should be routinely used to identify patients with this genetic subtype of AML.