Title: Cytogenetics and molecular biology in Acute Lymphoblastic Leukemia (ALL)

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Introduction :
Acute lymphoblastic leukemia is a group of heterogeneous diseases. Actually, 20% of acute leukemia cases are reported for adults against 80% for children. Several clinical, biological and therapeutic factors are essential for defining optimal treatment modalities. In children, acute lymphoblastic leukemia is known by the presence of recurrent genetic abnormalities. These abnomalities are described as specific markers which represent an important clinical aspect in the identification of significant risks. Cytogenetic analysis (karyotype along with, if necessary, adequate FISH analyzes) is an essential examination when diagnosing acute lymphoblastic leukemia (ALL)

Aims
Our focus in this study is to define the cytogenetic abnormalities considering some Moroccan patients and their frequency. A comparison of the cytogenetic profiles of cancer cells with other prognostic factors is also demonstrated with the evolution of ALL

Patient and methods
We established a descriptive study covering a period from 2014 to 2018 with an established diagnosis of ALL children and patients less than 20 years in the pediatric hematology and oncology department at the August 20th hospital. The data concerning cytogenetic profile were collected from patients' charts and we classified cytogenetic abnormalities according to French cytogenetic guidelines. The three identified groups are favorable, intermediate and unfavorable. In the Caryotype the sample containing the blasts is cultured and treated to obtain a sufficient number of mitotic cells which will be analyzed in conventional cytogenetics. The material used in this study is the bone marrow or the peripheral blood, when it contains blast cells. The Fish technique is used as a complementary test to confirm the prognosis of the ALL patient.

Results
141 Patients were collected for this study. The karyotype was performed on 105 patients. We analyzed 75 patients with B ALL. It was normal in 33 cases (37%). A hyperdiploidy between 51 and 65 chromosomes was found in 17 cases (17%). 10 cases showed karyotype failure. 25% of karyotypes were complex.
The use of molecular biology allowed the detection of MLL + gene in 4 patients, and BCR/ABL gene in 5 patients during this study.

Conclusion
The management of pediatric ALL has progressed enormously in these recent years, resulting in improved patient survival.
In our study we identified several cytogenetic abnormalities where the prognosis is unknown, as well as intermediate prognostic abnormalities, which encouraged us to set up a collaboration between hemato-biologists, geneticists and hematologists.