MINIMAL RESIDUAL DISEASE DETECTION IN OVARIAN CORTEX FROM LEUKEMIA PATIENTS BY EIGHT-COLOR FLOW CYTOMETRY

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Introduction: Ovarian cryopreservation and autograft of frozen/thawed ovarian tissue is a real option to preserve fertility in cancer patients. However, there is a concern regarding the possible presence of metastatic tumor cells in the implant, which could lead to the recurrence of the primary disease. We developed an original technique for minimal residual disease (MRD) detection in ovarian cortex by multicolor flow cytometry (FCM).

Materials and Methods: We used an automated dissociation protocol combining mechanical and enzymatic effects, allowing us to obtain an analysable cell population from ovarian cortical strips. Eight-color FCM strategy enabled us to assess the viability of the single cell suspension and to quantify neoplastic lymphoblasts by the identification of specific leukemic markers defining a leukemia associated phenotype (LAP). This technique initially developed for acute lymphoid leukemia (ALL) (Amiot C et al., 2013), has been adapted for acute myeloid leukemia (AML).

Results: Multicolor FCM was used to evaluate the presence of leukemic cells in cryopreserved ovarian cortex from 11 leukemia patients: 5 B-ALL, 2 T-ALL and 5 AML. The ovarian cortex of one T-ALL and 2 AML patients was positive for specific LAP by FCM. No molecular markers were available for those 3 positive patients.

Conclusion: FCM is useful for evaluating the presence of viable leukemic cells in ovarian cortex and this approach can potentially be applied to 100% of acute leukemia patient. Making available MRD detection techniques (FCM, PCR, xenograft), which can be used alone or together, is essential to control the risk of cancer re-seeding.