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Quantitative real-time polymerase chain reaction as an efficient molecular tool for detecting minimal residual disease in Moroccan chronic myeloid leukemia patients

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ABSTRACT. Chronic myeloid leukemia (CML) is characterized by *BCR-ABL* translocation and an increased number and migration of immature myeloid cells into the peripheral blood. The detection limit of the *BCR-ABL* transcript, particularly after treatment, is controversial. In the present study, we used quantitative real-time reverse transcription-polymerase chain reaction (RT-qPCR) to monitor *BCR-ABL* expression in Moroccan CML patients undergoing imatinib treatment, and compared the results with those of conventional PCR and fluorescence *in situ* hybridization (FISH). The aim of this study was to establish a new molecular tool for *in vitro* diagnosis of CML. In a retrospective comparative analysis, 20 CML Moroccan patients

who had received imatinib treatment (N = 20) were analyzed by real-time PCR, conventional RT-PCR, and FISH. Half of the samples analyzed (N = 10) were positive for *BCR-ABL* gene expression, while the other half (N = 10) were negative according to conventional PCR. Interestingly, 5 of the 10 samples shown to be negative by conventional PCR showed positive expression of the *BCR-ABL* gene according to RT-qPCR. The RT-qPCR results were confirmed by FISH, which revealed a high concordance (100%) rate. We found that real-time RT-qPCR is more reliable and should be used in Moroccan biomedical analysis laboratories to monitor CML progression, particularly for minimal residual disease, following imatinib treatment.

Key words: Chronic myeloid leukemia; BCR-ABL; Imatinib treatment; Molecular diagnostics; Moroccan chronic myeloid leukemia patients; Quantitative real-time polymerase chain reaction