Abstract

Chronic Myeloid Leukemia (CML) is characterized by the presence of Philadelphia chromosome, its resultant fusion gene (BCR-ABL) and fusion protein. Different transcript types of BCR-ABL occur due to different breakpoints in BCR gene and may show different prognostic significance. RT-PCR is by far the most reliable and efficient test for CML as the studies have shown high specificity and sensitivity of RT-PCR in qualitative and quantitative detection of BCR-ABL. In present study, we utilized RT-PCR technique to quantitatively detect BCR-ABL transcript in 48 CML patients and also determined the frequency of three BCR-ABL transcript variants (b3a2, b2a2 and e1a2) in the patients. Association of gender, age and hematological counts with BCR-ABL transcript type was also evaluated in the patients. FISH (results recorded from patient reports) and RT-PCR were compared for BCR-ABL detection in the patients. RNA was extracted from plasma and peripheral blood cells for the sake of comparison of both types of samples for BCR-ABL mRNA extraction and detection. Results showed that quality and quantity of RNA extracted from blood cells was much better than that of plasma. Mean (±SD) RNA yield (ng/µl) from plasma samples was 15.82 ± 4.52 and that from PB cells was 35.47 ± 12.7. The BCR-ABL/G6PD ratio in PB cells and plasma had a significant correlation ($p < 0.05$) but BCR-ABL/G6PD ratios from plasma samples were lower than that of PB cells samples. Overall good concordance was seen between FISH and RT-PCR in detection of BCR-ABL translocation in CML patients. FISH and RT-PCR showed concordance in 79.1 % samples. Among the BCR ABL transcripts detected in patients, the most frequent was b3a2, followed by b2a2 present in 32 (66.66%) and 10 (20.83%) respectively. Transcript e1a2 was not detected at all. No transcript was detected in 6 (12.5%) patients. No co-expression of transcripts was found in any of the patients. No significant correlation was found between transcript type and any of hematological parameter including hemoglobin count, platelet count and total leukocyte count ($p > 0.05$). Also, no significant correlation of transcript type with gender and age was found in the present study ($p > 0.05$). In conclusion, frequency of b3a2 was higher than b2a2 and e1a2 transcripts. There was no significant relation of gender, age and hematological counts with BCR-ABL transcript type. Plasma can be used as an alternative to blood cells for BCR-ABL quantification. FISH can be a reliable supplementary test to PCR for BCR-ABL detection.