

Telomerase activity in Philadelphia positive chronic myeloid leukaemia

Naglaa Abdel Rasoul¹, Nabil Elhalawani, Mohammed Hassan A Nafae, Dalal M Elkaffash, Zeinab I Mourad

Department of Internal Medicine, Faculty of Medicine, Alexandria University, Alexandria, Egypt.

PMID: 15724380

Telomerase is a specialized type of reverse transcriptase that catalyzes the synthesis and extension of telomeric DNA. Activation of telomerase and stabilization of telomeres are considered necessary for immortalization of tumor cells. Chronic Myeloid Leukaemia (CML) is a good example to investigate the reactivation of telomerase as; after a variable period in chronic phase, CML undergoes further evolution. The aim of this work is to study telomerase activity in patients with Philadelphia- positive CML and to compare the relative amount of telomerase activity between chronic phase, accelerated phase and blastic crisis. The study is conducted on 3 groups. Group I comprised ten newly diagnosed CML patients in chronic phase; five males and five females their ages ranged from 24-63 years ($X = 44.1 \pm 11.2$ years). Group II comprised ten patients in acute transformation (accelerated or blastic crisis phase); seven were males and three were females their ages ranged from 14 to 63 years ($X = 35.7 \pm 16.2$ years). Ten healthy subjects comprised the control group III; five males and five females their ages ranged from 14-50 years ($X = 31.8 \pm 12.4$ years). All patients were subjected to thorough history taking and clinical examination, complete blood picture with differential cell counts, bone marrow aspiration and/or biopsy, neutrophil alkaline phosphatase scoring by cytochemistry, immunophenotyping to identify the type of blast crisis, chromosomal analysis to detect Ph-positive cases, and measurement of telomerase activity by PCR-ELISA technique. Telomerase activity was highest in acute transformation with a range of (0.252-1.896) and mean of 1.521 0.496, while in chronic phase ranged between 0.67 and 0.743 with a mean of 0.305 \pm 0.109 and in normal controls the range was 0.45 to 0.195 with a mean of 0.102 \pm 0.048. The difference between groups was statistically significant. No correlation was found between the activity of the telomerase and hemoglobin, platelet, leucocyte counts, percentage of peripheral blood, bone marrow blasts, basophils, bone marrow cellularity, the type of crisis as well as leucocyte alkaline phosphatase scoring. In conclusion; The increased level of telomerase activity as noticed in the different stages of CML indicates its association with disease progression and can be used as a useful marker for evaluating development of the course.