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Correlation between pre and post treatment effect of imatinib and anti-oxidant status in chronic myeloid leukaemia patients

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Background: Chronic myeloid leukaemia (CML) is being a disorder marked by excessive proliferation of bone marrow elements and especially blood cells (leucocytes). Structural characteristics in CML, loss of leucocytes function, chromosomal translocation between chromosome 9 and chromosome 22 forming Philadelphia (Ph) chromosome and enlarged spleen result in an imbalance between free radical production and antioxidant defences. CML is generally associated with old age, hypertension, genetic mutation, environmental factors and oxidative stress.

Objectives: To determine the anti-oxidant status, micronutrients level in CML patients before and after treatment with imatinib.

Methodology: Comparative Study: Fifty (pre-treatment imatinib) patients of CML disease and fifty (post treatment imatinib) CML individuals' data were taken in the study. Blood sample were collected from Mayo Hospital, Lahore. 5.0 ml blood samples were taken and subjected to centrifuge at 3000-4000 rpm for 10-15 minutes for the separation of serum. The levels of oxidative stress biomarkers (GSH, SOD, AGES, NO, AOPP, MDA), serum electrolytes and micronutrients were estimated.

Results: NO level in CML (post treatment imatinib) patients was elevated remarkably (0.418 ± 0.077) as compared to CML (pre-treatment imatinib) patients (0.188 ± 0.244) and statistically significant (p -value <0.00). MDA level was also increased in (post treatment imatinib) CML patients (0.451 ± 0.076) as compared to (pre-treatment imatinib) CML patients (0.257 ± 0.159) and statistically significant (p -value <0.00). The level of advanced oxidation protein product (AOPP) in CML (pre-treatment imatinib) patients was decreased ($0.607 \pm 0.0.136$) as compared to CML (post treatment imatinib) patients (1.23 ± 0.271) and also statistically significant (p -value <0.00).

Conclusion: Present study concluded that strong association exists between oxidative stress, imatinib (TKI), micronutrients and serum electrolytes balance in CML patients. Pre- treatment imatinib patients of CML disease have increased lipid per oxidation leads to elevated level of MDA remarkably where as anti-oxidants decreases. Elevation in the nitric oxide, glutathione and superoxide dismutase; decrease level of vitamins are the cause for the progression of chronic myeloid leukaemia CML disease.

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