



Study of C-reactive Protein (CRP) in Chronic Lymphocytic Leukemia (CLL) Patients During Chemotherapy

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ABSTRACT

Background: Chronic lymphocytic leukemia (CLL) is characterized by a heterogeneous clinical course, ranging from stable to more aggressive disease. CRP is a sensitive, inexpensive and routinely available biomarker used for clinical diagnosis of acute and chronic inflammation.

Methods: A total of 86 consecutive treatment of patients with CLL and a control group comprised of apparently healthy individuals attending for periodic health examinations.

Results: The mean CRP level of patients with CLL was 59.377 mg/dL, high-CRP levels (109.83 mg/dL) whereas low-CRP values (3.91 mg/dL).

Conclusions: Markedly elevated levels of CRP was observed at the baseline stage in CLL patients, indicating significant inflammation and potential infection burden prior to chemotherapy initiation.

Keywords: CLL, CRP, Baseline.

INTRODUCTION

Chronic lymphocytic leukemia (CLL) is the most common adult leukemia in the Western world, affecting mostly elderly patients.¹ It is characterized by progressive accumulation of mature B-cells in the peripheral blood, bone marrow, lymph nodes, and spleen.² CLL generally has a relatively benign clinical course and treatment is only indicated when patients are symptomatic or have rapid progression of the disease.^{3,4} C-reactive protein (CRP) is a classical acute phase protein, produced by hepatocytes in response to inflammatory cytokines, particularly interleukin-6 (IL6).⁵ Plasma CRP is a sensitive, inexpensive and routinely available biomarker used for clinical diagnosis of acute and chronic inflammation.^{6,7}

C-reactive protein (CRP) is a classical acute phase protein, produced by hepatocytes in response to inflammatory cytokines, particularly interleukin-6 (IL6).⁸ Plasma CRP is a sensitive, inexpensive and routinely available biomarker used for clinical diagnosis of acute and chronic inflammation. Over the years, its clinical use has been broadened to include prediction and risk stratification of cardiovascular disorders and monitoring response to treatment of infection and inflammation. Circulating CRP levels are often elevated in patients with cancer (Citation4), and appear to be associated with an increased risk of developing cancer of any type.^{9,10}

MATERIAL & METHODS

Data were collected from confirmed diagnoses of Chronic Lymphocytic Leukemia (CLL) patients who meet the established diagnostic criteria and fulfill the inclusion criteria. The Chemiluminescent Microparticle Immuno Assay technique was used to determine the quantitative findings of CRP (C-reactive protein) test. This assay detects the levels of CRP (C-reactive protein in serum or plasma samples based on the principle of antigen-antibody binding. Assays only need to be calibrated once every thirty days, and the reagents have a lengthy shelf life of several months.

RESULTS

The mean value of CRP (baseline) is 59.377 and maximum value is 109.83 and minimum is 3.91 and the p-value is 0.0001 and is statistically highly significant. Out of the total 86 samples, the highest proportion was recovered from male patients (57%), while the lowest proportion was obtained from female patients (43%). Furthermore, males between the ages group of 66 to 70 years old were more infected (37%) while females between the age group of 56 to 60 and 61 to 65 years were infected at a rate of (27%) respectively.

Patient characteristics:

S. No.	Cycles	Mean/SD	Max.	Min.	p-value
1	Control	2.57/21.53	4.72	0.55	0.0001
2	Baseline	59.377/25.13	109.83	3.91	

DISCUSSION

The prevalence of CRP is 84 (97.67%). The mean value of CRP (baseline) is 59.377 and maximum value is 109.83 and minimum is 3.91 and the p-value is 0.0001 and is statistically highly significant. Another study by Elizete Negreiros found that the baseline serum CRP was high in 56 (82.3 %).¹¹ Another study by Soojung Hong et al. that the mean value of serum CRP prior to treatment was 4.7 ± 7.6 mg/dL; 0.3 ± 0.2 mg/dL in the normal CRP group and 8.4 ± 8.8 mg/dL in the high CRP group.¹²

Out of the total 86 samples, the highest proportion was recovered from male patients (57%), while the lowest proportion was obtained from female patients (43%). Furthermore, males between the ages group of 66 to 70 years old were more infected (37%) while females between the age group of 56 to 60 and 61 to 65 years were infected at a rate of (27%) respectively. Another study by Pulte and Brenner, analyzed the Surveillance, Epidemiology and End Results (SEER) database based on population based cancer registries during 1973–2006 in the US, and found improvement in survival among all age groups except in the elderly population (>75 years). They also noticed a lower survival rate of 52.7% for these patients and a better survival of 72% for patients younger than 44 years.¹³ Other study by Yair Herishanu et al found that the total

of 107 CLL patients with CLL were reviewed. More than half of the patients were males (n = 56, 52.5%), with a mean age of 71.8 years.¹⁴ A study by Elizete Negreiros found that the patients were predominantly male (61.8 %) and mean age was 34 years. Fifty-three (78 %) patients had advanced stage and (76.5 %) had B symptoms. The sample was predominantly male, comprising 42 (61.8 %) men and 26 (38.2 %) women, while median age was 34 years (15 to 68 years).¹¹

CONCLUSION

Markedly elevated levels of CRP was observed at the baseline stage in CLL patients, indicating significant inflammation and potential infection burden prior to chemotherapy initiation. The increased CRP level in patients with CLL is a potential marker for early cancer detection.

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