

Study of Leukemia and Lymphoma with Uric acid and Calcium levels with Pre and Post Chemotherapy.

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ABSTRACT

Background: Several metabolic abnormalities are reported in patients with lymphoma and leukemia before and after chemotherapy. Malignancies which are very sensitive to chemotherapeutic drugs often show a dramatic dissolution of tumor bulk soon after therapy is instituted. The main objective was to study the leukemia and lymphoma with Uric acid and calcium levels with pre and post chemotherapy. **Methods:** The study in LTBRKM Hospital Jagdalpur Chhattisgarh for a period of 2 years on 46 Patients. The age between 17 years and 75 years were included in this study. Permission from institutional ethics committee was obtained. All patients whom a diagnosis of Leukemia and lymphoma was confirmed were included in the study. **Results:** Out of 46 persons, in pre Uric Acid leukemia for 24 persons the mean value was 6.054 and standard deviation was 2.26. In Lymphoma for 22 persons the mean value was 7.123 and standard deviation was 4.21. In post uric acid leukemia for 24 persons the mean value was 6.142 and standard deviation was 6.87. And the mean value was 7.838 and standard deviation was 1.2 for post sodium leukemia, and the mean value was 7.868 and standard deviation was 0.74 was lymphoma. **Conclusion:** The changes in the renal and metabolic disturbances during pretreatment and post treatment were observed during the study period. Measurement of uric acid and calcium Values are important in both leukemia's and lymphomas.

Keywords: Leukemia, Lymphoma, Calcium Levels, Uric acid, Pre and Post Chemotherapy.

INTRODUCTION

Uric acid nephropathy is caused by rapid turnover of acute leukemic cells. Uric acid nephropathy is aggravated by dehydration, acidosis and therapy leading to tumor cell lysis.^[1]

Symptomatic hypocalcemia is the most common in patients with exceptionally high peripheral lymphoblast counts and some degree of renal insufficiency. These events may be caused by the increased endogenous phosphorous load resulting from the destruction of lymphoblasts, in the same fashion that purine release leads to hyper uricemia.^[2]

The prophylactic or therapeutic use of calcium in a hyperphosphatemic state may aggravate pre-existing metastatic calcification. The prophylactic administration of phosphate binding antacids prior to the initiation of chemotherapy in acute lymphoblastic leukemia may be warranted.^[3]

Involvement of the urinary tract in Burkitt's lymphoma is common when there is massive abdominal tumor, and may include ureteral

obstruction, urate nephropathy or renal cortical infiltration by tumor cells.^[4]

Lympho proliferative disorders frequently lead to hyperuricemia and acute renal failure due to urate deposition in the kidneys.^[5]

Chemotherapy is impressively effective in the initial treatment of most poorly differentiated lymphomas. The hyperkalemia previously observed after chemotherapy in acute lymphatic leukemia and poorly differentiated lymphoma was noted only in one of our patient.^[6]

MATERIALS AND METHODS

The study was conducted in LTBRKM Hospital Jagdalpur Chhattisgarh. Total number of patients was 46. All patients of Leukemia and lymphoma were assessed. Permission from institutional ethics committee was obtained. Patients above the age 17 years and below the age 75 years were included in the present study. Clinical examination includes full history and physical examination, chemistries of blood, and urine abdominal ultra-sonography and chest radiography. Uniform protocol was followed for investigations and management of the patients with lymphoma or leukemia. Supportive treatment included allopurinol (5 to 10 mg/kg/day) which was commenced in all patients shortly after diagnosis

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Marykutty & Kumar; Leukemia and Lymphoma with Uric acid and Calcium levels with Pre and Post Chemotherapy

confirmed. For the average sized adult patient the upper limit of normal creatinine was set at 1.3 mg/dl.

Inclusion Criteria:

- All patients whom a diagnosis of Leukemia was confirmed.
- All patients whom a diagnosis of Lymphoma was confirmed.

Exclusion Criteria:

- Patients less than 14 years of age.
- Patients more than 8 years of age
- Patients not willing for chemotherapy.

Statistical Analysis:

The data was analyzed as follows. The descriptive statistics were computed. These included the range, mean and standard deviation for quantitative variables and category frequency counts for qualitative variables. For statistical analysis t test was used.

RESULTS

Table 1: Age wise distribution of person with leukemia or lymphoma.

Age	No of persons with leukemia or lymphoma
15 – 20 Years	6
21 – 30 Years	10
31 –40 Years	11
41 – 50 Years	8
51 – 60 Years	4
61 – 75 Years	7
Total	46

[Table 1] shows age wise distribution. 46 persons with leukemia or lymphoma were admitted in the hospital. Out of 46 persons 6 persons were between age 15-20 years, 10 persons were between age 21-30 years, 11 persons are between age 31 – 40 years, 8 persons were between age 41-50 years, 4 persons are between age 51- 60 years and 7 persons between age 61-75 years.

Number of persons was more in the age group 31-40 years. And less number of persons in the age group 51-60 years.

Table 2: Serum Uric Acid in patient with leukemia or lymphoma prechemotherapy and post chemotherapy.

Group statistics diagnosis	No of persons	Mean	Standard deviation
Pre Uric Acid leukemia	24	6.054	2.26
Lymphoma	22	7.123	4.21
Post Uric Acid leukemia	24	6.142	6.87
Lymphoma	22	6.059	3.52

[Table 2] shows serum Uric Acid in patient with Leukemia or lymphoma prechemotherapy and post chemotherapy. Out of 46 persons, 24 persons were

of pre uric acid Leukemia and 22 persons were of Lymphoma. In pre Uric Acid leukemia for 24 persons the mean value was 6.054 and standard deviation was 2.26. In Lymphoma for 22 persons the mean value was 7.123 and standard deviation was 4.21.

Out of 46 persons, 24 persons were of post uric acid leukemia and 22 persons were of Lymphoma. In post uric acid leukemia for 24 persons the mean value was 6.142 and standard deviation was 6.87. In Lymphoma for 22 persons the mean value was 6.059 and standard deviation was 3.52.

Table 3: Serum Calcium in patient with leukemia or lymphoma prechemotherapy and post chemotherapy.

Group statistics diagnosis	No of persons	Mean	Standard deviation
Pre Calcium leukemia	24	8.583	0.59
Lymphoma	22	7.973	1.03
Post Calcium Leukemia	24	7.838	1.2
Lymphoma	22	7.868	0.74

[Table 3] shows serum Calcium in patients with leukemia or lymphoma prechemotherapy and post chemotherapy. Out of 46 persons 24 were of pre Calcium leukemia and 22 were of lymphoma. And the mean value was 8.583 and standard deviation was 0.59 for pre Calcium leukemia, and the mean value was 7.973 and standard deviation was 1.03 was lymphoma.

Out of 46 persons 24 were of post Calcium leukemia and 22 were of lymphoma. And the mean value was 7.838 and standard deviation was 1.2 for post sodium leukemia, and the mean value was 7.868 and standard deviation was 0.74 was lymphoma.

DISCUSSION

Siegel observed hyperuricemia, elevation of serum LDH and hyperphosphatemia with concomitant hypocalcemia.^[7]

Bresan and co- workers reported that hyperkalemia in non-Hodgkin's lymphoma was correlated with elevated levels of 1, 25(OH) 2 D3. This observation was soon followed by several reports confirming the same association with Hodgkin's disease.^[8]

Kabarow B in 1957 first noted a connection between vitamin D and humoral hyperkalemia in Hodgkin's disease.^[9]

Anderson J et al reported that hyperphosturia may not be entirely due to lymphoblast breakdown. Adrenal cortico steroids in pharmacological doses reduce the percent tubular reabsorption of phosphorous, causing a decrease of the serum phosphorous concentration.^[10]

Plimpton et al reported the pathogenesis of hypercalcemia in malignant diseases remains obscure, but there are several possible mechanisms.

Marykutty & Kumar; Leukemia and Lymphoma with Uric acid and Calcium levels with Pre and Post Chemotherapy

Parathyroid glands may be stimulated by a humeral substance from the malignant cells to secrete excessive amounts of endogenous parath hormone or these cells may secrete a parath hormone like polypeptide. Other possibilities include a vitamin D –like or a calcium binding substance being produced by the abnormal cells. A final mechanism may be direct release of calcium from bone by extensive infiltration with malignant cells.^[11]

CONCLUSION

The patterns of renal and metabolic disturbances observed during the pretreatment and post treatment period were concluded as follows. The hypocalcemic and hypocalciuric state observed in our study is probably due to a diet poor in calcium in the face of accelerated bone formation which is well known in lymphoma.

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