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General Medicine

STUDY OF CLINICO HEMATOLOGICAL CORRELATION OF PATIENTS WITH CHRONIC MYELOID LEUKEMIA (CML)

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ABSTRACT **Introduction:** Chronic myeloid leukemia is a slowly progressing type of blood cell cancer that begins in bone marrow. Chronic myeloid leukemia typically affects older adults. It is caused by a chromosome mutation that occurs spontaneously. Chronic myeloid leukemia (CML) is a myeloproliferative disorder characterized by a reciprocal translocation between chromosomes 9 and 22. Chronic Myeloid Leukemia (CML) is a disorder of proliferation which is unrestrained and excessive maturation proceeds fairly normally. The disease occurs chiefly between the ages of 30 and 80 years with a peak of 55 years. The main objective was to study the Clinico hematological correlation of patients with chronic myeloid leukemia. **Method:** The study was conducted on 50 patients in LTBRKM Hospital Jagdalpur Chhattisgarh. The study was conducted for a period of 3 year from 2016 – 2019. All patients with a diagnosis of Leukemia were assessed. Permission from institutional ethical committee was taken. Patients between 17 – 75 years were included. Clinical examination includes full history and physical examination, blood examination. **Result:** of 50 patients 5 were between age 15-20 years,12patients were between age 21-30 years, 15 patients are between age 31 – 40 years, 7 patients were between age 41-50 years.3 patients are between age 51- 60 years and 8 patients are between age 61-75 years. Out of 50 patients, 36 were males and 14 were females. **Conclusion:** The most common treatment method is chemotherapy. Bone marrow transplants, radiation are also available options. Chemotherapy is the most preferred method for treatment of leukemia.

KEYWORDS : Clinical profile, Hematological, Chronic myeloid leukemia.

Introduction: Chronic Myeloid Leukemia (CML) is a disorder of proliferation which is unrestrained and excessive maturation proceeds fairly normally. The disease occurs chiefly between the ages of 30 and 80 years with a peak of 55 years.

Chronic myeloid leukemia (CML) is a myeloproliferative disorder characterized by a reciprocal translocation between chromosomes 9 and 22. At the molecular level, the resultant fusion gene encodes a constitutively active Bcr-Abl tyrosine kinase, which has been shown to be necessary and sufficient to induce CML.[1]

CML was sub classified into (i) granulocytic and (ii) granulocytic megakaryocytic, depending on the morphology and distribution of the megakaryocytes in the bone marrow biopsy section. This histological classification of CML constituted an additional parameter in the diagnostic protocol of CML as it provided valuable information regarding the prognosis of individual patient.[2]

It was found that in patients with chronic myeloid leukemia (CML), immature granulated cells with characteristics of basophils react with antibodies against tryptase. However, it could not be clarified whether these cells are indeed basophils, belong to the MC lineage, or would represent an "intermediate cell.[3]

According to the infection hypothesis, diminished or delayed exposure to common viral or bacterial infections in infancy is a risk factor for childhood leukemia and possibly Hodgkin's lymphoma (19, 20). Because critical characteristics of the adult immune system are believed to be shaped by environmental exposures in early life, the timing, the type, and the number of episodes of infection may play a pivotal role, which cannot be assessed without a proper age stratification.[4]

Different dynamics of fibrosis and of neoplastic hematopoiesis and the rather low number of biopsies during periods with a major cytogenetic response might provide an explanation. The rather low number of metaphases usually not exceeding 50 and the negative influence of fibrosis on the aspirability of marrow cells may be further reasons, particularly when comparing them with the rather large amount of marrow evaluated by the morphometric measurements comprising about 0.8 105 cells on average.[5]

Method: The study was conducted on 50 patients in LTBRKM Hospital Jagdalpur Chhattisgarh. The study was conducted for a period of three years from 2016 to 2019;all patients with a diagnosis of Leukemia were assessed. Permission from institutional ethical committee was taken. Patients between 17 – 75 years were included. All patients were subjected to complete blood count analysis, lilac crest bone marrow aspiration and biopsies. Clinical examination includes full history and physical examination, blood examination, and urine abdominal ultra-sonography and chest radiography. Treatment included chemotherapy and supportive measures.

Inclusion Criteria:

- All patients whom a diagnosis of Leukemia was confirmed.
- All patients with informed consent form.

Exclusion Criteria:

- Patients less than 75 years of age.
- Patients more than 17 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.

Result: Table 1: Age wise distribution of the patients with leukemia.

Age	No of persons with leukemia
17 – 20 Years	5
21 – 30 Years	12
31 -40 Years	15
41 – 50 Years	7
51 – 60 Years	3
61 – 75 Years	8
Total	50

Table 1 shows age wise distribution. Out of 50 patients 5 were between age 15-20 years,12patients were between age 21-30 years, 15 patientsare between age 31 – 40 years, 7 patients were between age 41-50 years.3 patients are between age 51- 60 years and 8 patients are 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: Sex wise distribution of cases.

Sex	Total
Males	36
Females	14
Total	50

Table 2 shows sex wise distribution of cases. Out of 50 patients, 36 were males and 14 were females.

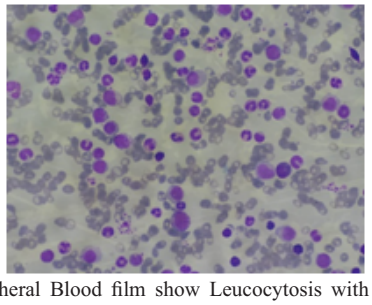
Table 3: Distribution of study subjects as per Hemoglobin%

Hemoglobin %in gm/dl	Total number of Patients	Percentage
< 5%	30	60%
5 -8.9%	18	36%
9 -11.9%	2	4%
>%12	0	0%
Total	50	100%

Out of 50 subjects 30 subjects i.e. 60% shows hemoglobin <5% and 18 subjects i.e36% shows hemoglobin 5 -8.9%.

Table 4: Distribution of study subjects as per Total leucocytes.

Total leucocytes	Number of patients	Percentage
50 – 1 lakh	2	4%
1 -2 lakhs	15	30%
2 -4 lakhs	33	66%
Total	50	100%



CML: Peripheral Blood film show Leucocytosis with all stage of myeloid cells from blast cells to neutrophils.

Out of 50 subjects, in 33 subjects i.e. 66% the leucocyte count was 2 -4 lakhs and in 15 subjects i.e. 30% the leucocyte count was 1 -2 lakh.

Table 5: Distribution of study subjects as per Platelet count.

Platelet count	Number of patients	Percentage
Less than 50,000	15	30%
50,000 – 1 lakh	30	60%
1 – 1.5 lakh	5	10%
Total	50	100%

Table 6: Distribution of study subjects as per Bone marrow blasts

Bone marrow blasts	Number of patients	Percentage
5 -10%	0	0%
10 -20%	0	0%
>20%	50	100%

DISCUSSION:

Drunker and colleagues4 discovered a molecule, imatinib mesylate, that inhibited bcr-abl kinase activity.4,5 This novel inhibitor was shown to be highly effective in blocking abl tyrosine kinase activity by binding and inactivating the adenosine triphosphate–binding pocket of abl6 in the leukemic cells in CML. It also inhibited the stem cell factor receptor c-kit (CD117)7 and the platelet derived growth factor receptor8 but had little effect on other tyrosine kinases.[6]

The hematopoiesis in the bone marrow was compared with the variables on peripheral hematological recovery, such as absolute numbers of blood leucocytes and granulocytes and time of appearance of reticulocytes in the blood; the day of the last thrombocyte transfusion was also taken as a measure of recovery of megakaryopoiesis.[7]

Previous investigations showed that survival decreases by 50% as one migrates from chronic phase through accelerated phase to blast crisis. Patients who undergo transplantation during remission after blast phase (also known as the second chronic phase) tend to have survival outcomes similar to accelerated phase cases, whereas survival of patients with CML in chronic phase is quite good, ranging from 60% to 80% at 5 years.[8]

The sensitivity of this method is higher than existing protocols for CML diagnosis. A 1: 105 dilution of 1, g of RNA from the Ph.'-positive K562 cell line still provided an easily detectable signal. One microgram of RNA is roughly equivalent to the amount contained in the cytoplasm of 100,000 K562 cells (10 pg. of cytoplasmic RNA per cell). Thus, the 1:105 dilutionscontain the RNA from about one K562 cell. Since just 1/10th of the reaction mixture was used for analysis, the positive signal represents the amplified product of less than one cell equivalent. This result demonstrates that diagnosis is feasible even when the leukemic cells are present in extremely small numbers.[9]

Mutation of the nucleophosmin (NPM) gene has recently been described as the most frequent mutation in acute myeloid leukemia (AML). NPM is a nucleus-cytoplasm shuttling protein already known to be involved in rearrangements in leukemia and lymphoma.[10]

CONCLUSION:

Leukemia can be fatal, but with early diagnosis, proper treatments, it can be put into remission. Treatment of leukemia is very complex. The most common treatment method is chemotherapy. Bone marrow transplants, radiation are also available options. Chemotherapy is a treatment method in which drugs are given to kill off the cancerous cells.

REFERENCES:

1) Yin Xu, MD, PhD, Andrea E. Wahner, MS, and Phuong L. Nguyen, MD.Progression of Chronic Myeloid Leukemia to Blast Crisis during Treatment with Imatinib Mesylate. Archives of Pathology & Laboratory Medicine: September 2004, Vol. 128, No. 9, pp. 980-985.
2) Yookarin Khonglah MD, Debdatta Basu MD and *Tarun Kumar Dutta MD Malaysian. Bone marrow trephine biopsy findings in chronic myeloid leukemia. J Pathol 2002; 24(1) : p37 - 43
3) Puchit Samorapoompichit, Hans P. Kiener, Gerit-Holger Schernthaner, John-Hendrik Jordan, Hermine Agis, Friedrich Wimazal, Mehrdad Baghestanian, Abdolreza Rezaie-Majd, Wolfgang R. Sperr, Klaus Lechner, and Peter Valent. Detection of tryptase in cytoplasmic granules of basophils in patients with chronic myeloid leukemia and other myeloid neoplasms.Blood.2001; 98(8):p2580 -83.
4) Andrea Altieri, Felipe Castro, Justo Lorenzo Bermejo, and Kari Hemminki. Number of Siblings and the Risk of Lymphoma, Leukemia, and Myeloma by Histopathology. Cancer epidemiology biomarkers prevention.2006; v15 (7).
5) G Buesche1 , R Hehlmann2 , H Hecker3 , H Heimpel4 , B Heinze5 et L. Marrow fibrosis, indicator of therapy failure in chronic myeloid leukemia prospective long-term results from a randomized-controlled trial.leukemia.2003 17, p2444–2453.
6) John L. Frater, MD, Martin S. Tallman, MD, Daina Variakojis, MD, Brian J. Druker, MD, Debra Resta, RN, Mary Beth Riley, RN, MSN ET AL. Chronic Myeloid Leukemia Following Therapy with Imatinib Mesylate (Gleevec): Bone Marrow Histopathology and Correlation with Genetic Status American Journal of Clinical Pathology, Volume 119, Issue 6, June 2003, Pages 833–841.
7) H van den Berg, Ph M Kluin, J M Vossen. Early reconstitution of hematopoiesis after allogeneic bone marrow transplantation: a prospective histopathological study of bone marrow biopsy specimens. J Clin Pathol 1990; 43:p365-369.
8) Qin Huang, MD, PhD, Yaping Wu, MD, David S. Snyder, MD, Karen L. Chang, MD, Marilyn L. Slovak. Clinical and Pathologic Analysis of 16 Cases of Relapsed Chronic Myeloid Leukemia after Stem Cell Transplantation.American Journal of Clinical Pathology.2007. Volume 128, Issue 4; Pages 565–570.
9) ERNEST S. KAWASAKI, STEVEN S. CLARKf, MAZIE ET AL. Diagnosis of chronic myeloid and acute lymphocytic leukemia's by detection of leukemia-specific mRNA sequences amplified in vitro.PNAS. 1988; 85 (15) p5698-5702;
10) Nicolas Boissel, Aline Renneville, Valeria Biggio, Nathalie Philippe, Xavier Thomas, Jean-Michel Cayuela, Christine Terre, Isabelle Tigaud, Sylvie Castaigne, Emmanuel Raffoux. Prevalence, clinical profile, and prognosis of NPM mutations in AML with normal karyotype.Blood.2005; v106 (10) p3618 -3620.