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Haematological Malignancies – A Clinico Haematologial Profile

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ABSTRACT

Introduction: Disease can emerge from any tissue in the body. Tissues with quickly duplicating cells are at more danger of having the disease. The haemopoietic framework is one of them.

Aim: The present study aims at knowing the break up of haematological malignancies, they are the clinico-haematological correlation; classify them by adapting the FAB classification and providing study based suggestions for better diagnosis and treatment of haematological malignancies Methods-In the present study, a total of ninety-eight cases of haematological malignancies were studied to evaluate the clinico-haematological spectrum of different types of haematological malignancies. Patients belonged to all age groups, the youngest being 1 year old and the eldest 86 years.

Results: Majority of cases were seen in 5th-7th decades. Majority of cases of ALL were below 20 years of age while AML was seen in all age groups. CML was commonly found in middle age whereas CLL was seen in the elderly. The male: female ratio was 2.92: 1. Common clinical signs included pallor, splenomegaly and/or hepatomegaly. In CML, weakness, abdominal fullness and pain, and fever were the common presenting feature whereas; splenomegaly was present in the majority of the cases. In laboratory investigations, the majority of cases of AML and ALL had severe anaemia (Hb <7gm. The total leukocyte count was raised in the majority of cases of AML while for ALL, the TLC varied from leucocytosis to severe leucopenia (1, 100-3, 20, 000/cmm). All the cases of AML had thrombocytopenia (mean 36,785/cmm), while the majority of cases of ALL also had decreased platelet count. Majority of cases of CML had thrombocytosis.

Conclusion: More studies are required on larger samples and with the help of more sophisticated diagnostic techniques to have a better idea of different subtypes of the individual malignancies and to achieve better therapeutic goals in this area. No doubt this is tedious work, but it is not impossible if a little attention is paid to this important health problem.

Key Words: Haematology, Malignancies, Myelodysplastic syndrome, Acute Lymphomas, Chronic Lymphomas

INTRODUCTION

The disease can emerge from any tissue in the body. Tissues with quickly duplicating cells are at more danger of having the disease. The haemopoietic framework is one of them. Malignancies of this framework are known as leukaemia and lymphoma. Leukaemia was perceived by Virchow in 1945 as a clinical element just because. Later specialists contributed a great deal by arranging this clinical condition. Lymphoma, carefully a harmful issue of the cells local to lymphoid tissue, was assembled alongside leukaemia due to the regular starting point of both. Haematological malignancies are relatively common, affect all ages and demonstrate extraordinary biologic, morphologic and clinical heterogeneity. It broadly includes Leukaemia, Acute & Chronic, Lymphomas, Chronic myeloproliferative disorders and Plasma Cell Dyscrasias.[1,2]

Previously Haemopoietic lymphoid malignancies, especially acute leukaemia were regarded as a devastating illness usually terminated by haemorrhage or infection. A change in the grave outlook of the disease was brought by the introduction of various chemotherapeutic agents especially folic acid antagonists. It has appeared that a therapeutic cure has been possible at least in some types of haematological malignancies. Due to this observation, the classification of haematological malignancies assumed increased importance, as now the management depends entirely on the exact type of hae-

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matological malignancies. The classification brings together conditions with similar clinical features using well-defined criteria, which are easily reproducible and have therapeutic and prognostic bearing.[3]

As haematological malignancies are rapidly progressive disease, early treatments are important and hence require early diagnosis. Though it is mainly haematological diagnosis, clinical suspicion is very important. Symptoms of the patient, findings on clinical examination can direct towards appropriate investigations. Also when the haematological investigations are confusing, the clinical presentation can point significantly towards the diagnosis of the particular type of haematological malignancies.[2]

MATERIALS AND METHODOLOGY

The present study was carried out in the department of pathology, Krishna Institute of Medical Sciences, Karad, for five years.

Selection of Patients:

Patients with a clinical and haematological suspicion of haematological malignancy attending the OPD or admitted in the hospital were included in this study.

Thus a total of 98 patients of Haematological malignancies were included in the study. A total of five cases of Myelodysplastic syndrome were also recorded.

At the time of the first examination, a detailed history was taken, such as fever, weakness, fatigue, weight loss, bleeding tendencies, ulcers, cough, expectoration, bone and joint pain, abdominal fullness or lump, pain in the abdomen, headache, loose motions, vomiting.

A detailed clinical examination was done at the time of diagnosis. This included:

a. General Examination with a recording of signs such as pallor, pyrexia, lymphadenopathy, bone tenderness, petechiae or ecchymosis, gum hypertrophy, ulcerative lesion over the mucous membrane.
b. Detailed systemic examination for assessing hepatomegaly, splenomegaly and generalised lymphadenopathy.

All the patients underwent baseline haematological investigation. This included Hb estimation, TLC, DLC, platelet count, reticulocyte count, ESR and peripheral blood smear examination.

Hb estimation, DLC, Total leukocyte count and platelet count was done by using 'Orphee Mythic' Automated Coulter.

Peripheral blood smear examination:

- PBS stained with Leishman's stain (Routine) was prepared for all the cases and examined.
- A differential count was performed and the morphology of all the abnormal cells noted. The platelet count was also noted.
- In cases of leukaemias with severe leucopenia, 'Buffy coat' smears were prepared and stained with Leishman's stain and examined for the presence of blast cells.
- A provisional diagnosis was made based on routinely stained peripheral blood smears.
  Special cytochemical staining was done in cases wherever needed. The stains included were Myeloperoxidase, Sudan black-B and Periodic acid Schiff.
  For all the cytochemical procedures fresh peripheral blood smears were used. The following results were obtained in the respective positive cases.
- MPO: - Positive reaction was indicated by brown-black granules in the cytoplasm.
- SBB: - Positive reaction was indicated by black granules in the cytoplasm.
- PAS: - Positive reaction was indicated by magenta coloured staining.

Bone Marrow Aspiration Study:

It was done in 68 of the 98 cases of haematological malignancies using the Salah's bone marrow aspiration needle. Body of sternum or posterior superior iliac spine was the site of aspiration.

Informed written consent of the patient or patient's relative was taken in all the cases and the procedure was done under total aseptic precautions after giving local anaesthesia with 3cc of 2% lignocaine.

Smears were prepared and air-dried. They were stained with Leishman's stain. Special stains like Perl's stain for iron, MPO and PAS were carried out wherever required.

Bone marrow aspiration smears were meticulously examined for the following parameters...

1. Cellularity
2. Predominant series
3. Myeloid: Erythroid ratio
4. Erythroid series cells
5. Myeloid series cells
6. Lymphocytes, plasma cells
7. Megakaryocytes
8. Iron stores
9. Abnormal cells or parasites

At least 500 cells were counted to obtain the differential leucocyte count.

Bone Marrow Trephine Biopsy

This is performed in cases where it was indicated either because of 'Dry Tap' marrow aspiration or a hypocellular aspirate. It was done using 'Jamshidi's needle'. The posterior

superior iliac spine was the preferred site for the procedure.

The skin was prepared with antiseptics, draped and local anaesthetic in the form of 2% lignocaine was infiltrated in the skin and the deeper tissues, especially the periosteum. After making a 3mm skin incision with a sterile scalpel blade, the biopsy needle was introduced pointing towards the anterior superior iliac spine into the bone cortex with a rotating movement and gently advanced after removing the stylet. An optimal specimen, approximately 3/ 4th inch (1-2 cm) long, 1/6 to 1/8 inch in diameter was obtained.

The biopsy specimen was gently removed through the proximal end with a long probe introduced through the distal cutting end and imprint smears were made. The specimen was collected in Zenker's fixative, decalcified in 14% EDTA solution for two hours and routinely processed in histopathology. Paraffin-embedded sections were stained using Haematoxylin and eosin and examined. Imprint smears were processed and examined similar to bone marrow aspirate smears.

Biochemical tests

The following tests were done:-

- Liver Function Tests like Sr. Bilirubin, Sr. Enzymes like AST and ALT, Sr.Calcium levels; Sr. Albumin and Sr. Globulin were done.
- Renal Function Tests like Blood Urea level, Sr. Creatinine and Sr. Uric acid were done.
  These tests were done in the biochemistry laboratory of the hospital using the methods routinely followed there.

Radiological Examination:

Routine chest Xray and abdominal ultrasonography were performed. X-ray of the spine and the skull were done in cases of Multiple Myeloma.

Other Tests like Serum electrophoresis and urine examination for Bence- Jones proteinuria were done in cases of Multiple Myeloma.

Cerebrospinal Fluid Examination:

It was done in patients of ALL having CNS symptoms. The smears were stained with Romanovsky stains and examined for the presence of any atypical cells.

RESULTS

AML (28.57%) is the commonest hematological malignancy, followed by ALL(21.43%), CML(15.31%), NHL(14.29%), CLL(9.18%), MM(9.18%) while HCL(1.02%),HL(1.02%) are the least common(Table 1).

Around 43% of the cases were in the 5th-7th decades. However, age incidence varies depending on the type of haematological malignancy(Table 2).

The incidence in males is higher as compared to females. M: F- 2.92: 1(Table 3).

Fever (48.98%) and generalized weakness (37.76%) were the commonest symptoms while bone pain (5.10%) and loss of weight (4.08%) were seen only in a small minority of cases(Table 4).

Fever and generalized weakness were the commonest presenting features in all the leukaemias. 50% 0f cases of NHL had lymphadenopathy(Table 5).

Progressive pallor (91.84%), splenomegaly (41.84%), and hepatomegaly (37.76%) were the commonest observed signs(Table 6).

Progressive pallor and hepatosplenomegaly are commonly observed signs in acute & chronic leukaemias. Majority of cases of CML (80%) had splenomegaly(Table 7).

M2 (46.43%) is the commonest subtype of AML, followed by M1 (21.43%), M3 & M0 (10.72% each), and M4 (3.57%). while two case could not be subtyped(Table 8).

L1 (42.85%) is the commonest ALL subtype, followed by L2 (28.57%), and L3 (9.52%). Four cases could not be subtyped(Table 9).

Severe anaemia is seen in the majority of cases of AML (71.42%) and ALL (61.90%). The Hb value varies from mild to a moderate degree in other haematological malignancies(Table 10).

All the cases of CML (100%) had leucocytosis, however, the total WBC count varies in different haematological malign (Table 11).

Thrombocytopenia is seen in the majority of cases in AML (100%) and ALL (80.95%). Majority of cases of CML (60%) had thrombocytosis. (Table 12).

Hypercellular bone marrow is seen in the majority of the cases. (Table 13).

Anaemia varies from moderate to severe degree in all the haematological malignancies. Mean TLC was highest in CML, while platelet count is markedly reduced in AML and ALL(Table 14).

DISCUSSION

Haematological malignancies are not uncommon in our country. Different studies have been conducted on various aspects of individual haematological malignancies in the past. The present study was undertaken to diagnose, analyse and classify haematological malignancies in our setup and correlate the clinical findings with the haematological data.

A total of 98 cases were evaluated in the study in 5 years from June 2003 to May 2008. Patients were from all age groups. Detailed clinical history and physical examination findings were obtained in all the cases wherever possible. All the necessary and relevant investigation findings were also obtained. In a few cases, already prepared peripheral blood smears and bone marrow aspiration or biopsy slides were sent to our hospital for review.

DISTRIBUTION OF SUBTYPE OF HAEMATOLOGICAL MALIGNANCIES

In the present study, AML (28.57%) was the most common type of haematological malignancy, followed by ALL (21.43%), CML (15.31%), NHL (14.29%), and CLL (9.18%), MM (9.18%), while Hodgkin's lymphoma & Hairy cell leukaemia (1.02% each) were the least common.

A total of five cases of myelodysplastic syndrome were also recorded in the study. All the cases encountered in this study belonged to the refractory anaemia category as per the FAB classification for Myelodysplastic syndromes. However, as MDS is considered to be a preleukaemic condition with a variable risk for development of acute leukaemia, it is not included as a haematological malignancy. Muhammad Idris et al.[6], in their study of 60 cases of haematological malignancies obtained similar distribution of cases. Another study conducted in Northern Pakistan showed that Leukaemia was second commonest cancer in males and third commonest cancer in females. The distribution of type of leukaemias was similar as seen in the present study.

In the present work, acute leukaemias (50%) were more common than chronic leukaemias (24.49%).In acute type; Acute Myeloid Leukaemia (28.57%) was more common than Acute Lymphocytic Leukaemia (21.43%). In chronic type, Chronic Myeloid Leukaemia (15.31%) was more common as compared to Chronic Lymphocytic Leukaemia (9.18%). This observation is similar to that made by other workers in oriental countries.[1,2]

In the present study, AML M2 was the commonest (46.43%) subtype of the AML (Table 6), followed by AML M1 (21.43%), M3 and M0 (10.72% each), and AML M4 (3.57%). Two cases of AML could not be typed because of loss of follow up of the patients because of referral of the patient to a higher centre for further typing and treatment and death of the patient respectively. Shome et al 1985[3] found AML M2 as the commonest subtype (31.5%) in his study.[10]

In the present work, ALL L1 was observed as the commonest subtype (42.85%) (Table 7) followed by L2 (28.57%) and L3 (9.52%). A similar observation was noted by Brearly et al 1979[4]. found L_1 in 59% and L_2 in 39% of the cases in her study of childhood leukaemias.[8,9]

AGE INCIDENCE

Patients from all age groups were obtained in the study, the youngest patient was of 1 year and eldest was 86 years of age. In the present study, most of the patients belonged to the older age group. Thus, Around 43% of cases were in the 5^{th}-7^{th} decades. This finding is similar to that observed by Muhammad Idris et al .[6]

SEX INCIDENCE

In the present study, the male preponderance is seen with a male: female ratio of 2.9: 1. This finding is similar to that observed by other workers.

CLINICAL FEATURES

In the present study low-grade fever, generalized weakness, fatigue and progressive pallor were the commonest symptoms. Pallor was the most frequently observed sign.

AML

In the present study fever as a presenting symptom was seen in 82.14%, weakness in 35.71% and bleeding in 17.86% of cases. These findings were not different from those obtained by Hassan and Quereshim et al 1993.[7]

ALL

In the present study fever (61.90%), weakness or fatigue (42.86%) and pain in the abdomen and abdominal masses (38.09%) were the most frequently noted symptoms.

In the present study, pallor was noted in 85.71% of cases of ALL while organomegaly (Hepatomegaly and/or splenomegaly) was noted in more than half of the patients. Lymphadenopathy was seen in approximately 20% of the cases. Similar observations were made by Boggs et al 1962,[8] Most of the clinical features common to all acute leukaemias are dependant on the basic features of the disease interference with the normal production of erythrocytes, leukocytes and platelets and the increased mass of neoplastic cells in the bone marrow and at other sites.

CML

In the present study, weakness (66.67%), abdominal fullness (33.33%) and fever (33.33%) were found to be the common symptoms. Majority of the patients (80%) had splenomegaly; pallor was present in 93% of the cases while 20% of cases had hepatomegaly. Similar findings were noted by Alexander et al 1995.[9,10,11]

CLL

In the present work, approximately 56% of cases presented with fatigue or generalised weakness, low-grade fever, abnormal masses and lymphadenopathy being other commonly encountered symptoms. Boggs et al 1966)[10] noted fatigue in

80% of his cases and abnormal masses being the next common finding (50%).

HCL

In the present work, one case of HCL was noted. The patient presented with generalised weakness and had progressive pallor and marked splenomegaly. Other workers namely Golomb HM et al. 1978[11], also noted weakness and fatigue as the common symptoms while splenomegaly was present in approximately 90% of the cases.

NHL

In the present study half of the cases of NHL had lymphadenopathy as the chief presenting feature followed by generalised weakness (28%), low-grade fever (21.43%), pain in the abdomen and abnormal masses (21.43%).

All the patients had pallor and more than 70% of the patients had lymphadenopathy. More than half of the patients had hepatomegaly (64.28%) and splenomegaly (50%). Muhammad Idris et al. [12]

Hodgkin's Disease

One case of Hodgkin's disease was noted in the present study. The patient was a 49-year-old male and presented with generalized lymphadenopathy having enlarged cervical, supraclavicular and inguinal lymph nodes and progressive pallor. In the study carried out by Muhammad Idris et al. [6]

MM

In the present study Bone tenderness and generalized fatigue were the commonest symptoms (33.33% each) followed by fever, abdominal fullness, breathlessness and vomiting.

Amongst the signs, approximately 78% of cases had pallor. Only a few patients (11%) had hepatomegaly. Muhammad Idris et al .[6]

MDS

Respiratory complains like breathlessness, cough with expectoration, fever and fatigue or weakness were the common presenting symptoms in cases of MDS in present work, while progressive pallor was the commonest sign present in all the cases followed by hepatomegaly and splenomegaly.

The respiratory complaints like breathlessness, cough with expectoration can be attributed to pneumonitis due to peripheral cytopenias whereas fatigue, weakness, exercise intolerance and lethargy can be as a result of unrecognised anaemia.

HAEMATOLOGICAL FEATURES

Haemoglobin Value

Anaemia was again classified as mild, moderate and severe corresponding to lower limit of normal to 10gm%, 10 to 7 g,% and below 7 gm%

The majority (78%) of cases of Multiple Myeloma had mild to moderate degree of anaemia with mean Hb of 7.9 gm%. One case of Hairy Cell Leukaemia was noted. The patient had severe anaemia with Hb value of 5.1 gm%. For MDS, 4 out of 5 cases had severe anaemia with a mean Hb value of 3.85 gm%. Muhammad Idris et al.[6] noted anaemia in all the cases in their study.

Total Leukocyte Count

In the present study, the Total leukocyte count for AML was in the range from 300- 2, 36, 000/ cmm (Table 14). 17.85% of the patients of AML presented with subleukaemic blood picture (Table 11). Boggs et al [8] noted it in 29% in 3.3% of their cases.

In the present study, the majority of the patients of AML (64.28%) had leucocytosis. Similar findings were noted by other workers like Boggs et al.[8] who noted leucocytosis in 51.85% and 45.65% of their cases respectively. Muhammad Idris et al.[6] also obtained mean TLC value of 45, 000/ cmm in their study for AML.

In the present study, all the cases of CML had leucocytosis. The range for TLC was 44, 800- 2, 72, 400/ cmm with the mean TLC value of 1, 55, 170/ cmm. Barbara Bain et al. [12], in their study, noted that the leucocytosis on the peripheral blood smears is the most important histologic finding.

In the present study, one case of Hodgkin's lymphoma was detected with WBC count of 2500/ cmm i.e. leucopenia. In Plasma Cell Dyscrasias, 66.67% of cases had WBC counts within normal limits. The range of TLC was 5, 500- 26, 400/ cmm with a mean value of 12, 400/ cmm. Muhammad Idris et al [6] noted the mean WBC count of 11, 333/ cmm, in cases of MM in their study.

Platelet Count

In the present study, all the cases of AML and the majority of cases of ALL (80.95%) had thrombocytopenia at the time of diagnosis. The range of Platelet count for AML was between < 15, 000 to 1.25 lacs/ cmm with a mean value of 36, 785/ cmm. For ALL, the range of platelet count was < 15, 000 to 3.15 lacs/ cmm with a mean value of 60, 000/ cmm. and colleagues noted that thrombocytopenia is extremely common in acute leukaemia with platelet counts well below 50, 000/ cmm.

Bone Marrow Findings

Bone marrow study was carried out in 68 out of 98 cases (69.38%).In cases of leukaemia, bone marrow aspirate formed the mainstay of diagnosis for its excellent morphological details. Majority of cases of haematological malignancies had hypercellular bone marrow (86.74%) while, 'Dry Tap' was obtained in occasional cases of ALL (2 cases), CML (1 case) and NHL (1 case). 'Dry Tap' might be obtained due to packed marrow, bone marrow fibrosis or due to increased marrow fibrosis. One case of ALL, who was on chemotherapy, had hypocellular bone marrow. In such cases where aspirate could not be obtained or was hypocellular as a result of dry tap, imprint smears were of great value for evaluation of morphologic details.

CONCLUSION

More studies are required on larger samples and with the help of more sophisticated diagnostic techniques to have a better idea of different subtypes of the individual malignancies and to achieve better therapeutic goals in this area. No doubt this is tedious work, but it is not impossible if a little attention is paid to this important health problem.

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REFERENCES

1. Advani GN, Jordan AG, Lupis CH, Longini RL. A thermodynamic analysis of the deposition of SnO2 thin films from the vapour phase. Thin Solid Films. 1979 Oct 1;62(3):361-8.
2. Prakash RK, Hooykaas PJJ, Ledeboer AM, Schilperoort RA, Nuti MP, Lepidi AA, Casse F, Boucher C, Julliot JS, Dénarié J (1980) Detection, isolation and characterization of large plasmids in Rhizobium. In: Newton WE and Orme-Johnson (eds) Nitrogen Fixation, vol 2. University Park Press, Baltimore, p 139–163
3. Shome DK, Ghosh K, Mohanty D, Das KC. Leukaemia in north-west India. Acta Haematologica. 1985;73(4):244
4. Brealey CJ, Lawrence DK. High-performance liquid chromatography of pirimiphos-methyl and five metabolites. Journal of Chromatography A. 1979 Jan 21;168(2):461-9.
5. Kaur R, Mittal N, Kakkar M, Aggarwal AK, Mathur MD. Otomycosis: a clinicomycologic study. Ear, nose & throat journal. 2000 Aug;79(8):606
6. Idris NM, Gnanasammandhan MK, Zhang J, Ho PC, Mahendran R, Zhang Y. In vivo photodynamic therapy using upconversion nanoparticles as remote-controlled nano transducers. Nature medicine. 2012 Oct;18(10):1580.
7. Qureshi MH. Tall fescue growth and nitrogen uptake as influenced by non-thermal residue management.
8. Boggs DR, Wintrobe MM, Cartwright GE. The acute leukemias: Analysis of 322 cases and review of the literature. Medicine. 1962 Sep 1;41(3):163-225.
9. Alexander JC. Fin de siècle social theory: Relativism, reduction, and the problem of reason. Verso; 1995.
10. Boggs DR, Sofferman SA, Wintrobe MM, Cartwright GE. Factors influencing the duration of survival of patients with chronic lymphocytic leukaemia. The American journal of medicine. 1966 Feb 1;40(2):243-54.
11. Golomb HM, Catovsky D, Golde DW. Hairy cell leukaemia: a clinical review based on 71 cases. Annals of Internal Medicine. 1978 Nov 1;89(5):677-83.
12. Bain B, Vas MR, LOWENSTEIN L. The development of large immature mononuclear cells in mixed leukocyte cultures. Blood. 1964 Jan;23(1):108-16.

Table 1: Frequency of Types of Haematological Malignancies

SR. NO.	HAEMATOLOGICAL MALIGNANCIES	NO.OF CASES	PERCENTAGE(%)
1	Acute Myeloid Leukaemia	28	28.57
2	Acute Lymphoid Leukaemia	21	21.43
3	Chronic Myeloid Leukaemia	15	15.31
4	Chronic Lymphoid Leukaemia	9	9.18
5	Hairy Cell Leukaemia	1	1.02
6	Non-Hodgkins Lymphoma	14	14.29
7	Hodgkins Lymphoma	1	1.02
8	Multiple Myeloma	9	9.18
	TOTAL	98	100

Table 2: Age Distribution in Haematological Malignancies

AGE GROUP	AML	ALL	CML	CLL	HCL	NHL	HD	MM	TOTAL
0-10	2(7.14)	10(47.62)	-	-	-	-	-	-	12(12.24)
11-20	4(14.28)	7(33.33)	1(6.67)	-	-	3(21.43)	-	-	15(15.31)
21-30	5(17.85)	1(4.76)	3(20)	-	-	1(7.14)	-	-	10(10.20)
31-40	6(21.43)	-	3(20)	-	-	2(14.29)	-	-	11(11.22)
41-50	2(7.14)	-	3(20)	1(11.11)	-	-	1(100)	1(11.11)	8(8.16)
51-60	5(17.85)	2(9.52)	3(20)	4(44.44)	-	3(21.43)	-	4(44.44)	21(21.43)
>60	4(14.28)	1(4.76)	2(13.33)	4(44.44)	1(100)	5(35.71)	-	4(44.44)	21(21.43)
TOTAL	28	21	15	9	1	14	1	9	98(100)

Table 3: Sex Distribution in Haematological Malignancies

TYPE	NO. OF CASES.OF	ANO. OF MALES	NO. OF FEMALES	RATIO M: F
AML	28	20	8	2.5:1
ALL	21	15	6	2.5:1
CML	15	10	5	2:1
CLL	9	9	0	-
HCL	1	1	0	-
NHL	14	10	4	2.5:1
HD	1	1	0	0
MM	9	7	2	3.5:1
TOTAL	98	73	25	2.92:1

Table 4: Frequency of Presenting Symptoms in Haematological Malignancies

PRESENTING FEATURE	NO. OF CASES n=98	PERCENTAGE (%)
Fever	48	48.98
Weakness/ Fatigue	37	37.76
Bleeding	10	10.20
Pain In Abdomen	21	21.42
Bone Pain/ Joint Pain	5	5.10
Loss of Weight	4	4.08
Swelling or LNpathy	12	12.24
Cough with expectoration/ Breathlessness	19	19.39
Loose Stool/ Vomiting	11	11.22
Others	3	3.06

Table 5: Frequency of Presenting Symptoms In Subtypes of Haematological Malignancies

C/F	AML	ALL	CML	CLL	HCL	NHL	HD	MM
Fever	23(82.14)	13(61.90)	5(33.33)	2(22.22)	0	3(21.43)	0	2(22.22)
Weakness	10(3.57)	9(42.86)	10(66.67)	5(55.56)	1(100)	4(28.57)	0	3(33.33)
Bleeding	5(17.86)	4(19.05)	1(6.67)	0	0	0	0	0
PIA	2(7.14)	8(38.09)	5(33.33)	2(22.22)	0	3(21.43)	0	1(11.11)
Bone pain	0	2(9.52)	0	0	0	0	0	3(33.33)

Table 5: *(Continued)*

C/F	AML	ALL	CML	CLL	HCL	NHL	HD	MM
Loss of Wt.	1(3.57)	1(4.76)	1(6.67)	0	0	1(7.14)	0	0
LN Pathy	1(3.57)	0	1(6.67)	2(22.22)	0	7(50)	1(100)	0
Breath lessness	8(28.57)	3(14.28)	2(13.33)	2(22.22)	0	2(14.28)	0	2(22.22)
Diarrhea/ vomiting	1(3.57)	4(19.05)	1(6.67)	0	0	3(21.43)	0	2(22.22)
Others	2(7.14)	0	1(6.67)	0	0	0	0	0

Table 6: Frequency of clinical signs in haematological malignancies

SIGNS	NO. OF CASES n=98	PERCENTAGE (%)
Pallor	90	91.84
Hepatomegaly	37	37.76
Splenomegaly	41	41.84
LNpathy	26	26.53
Sternal tenderness/ Bone pain	2	2.04
Petechiae Ecchymosis	1	1.02
Others	6	6.12

Table 7: Frequency of Clinical Signs in Subtypes of Haematological Malignancies

SIGNS	AML	ALL	CML	CLL	HCL	NHL	Hl	MM
Pallor	28(100)	18(85.71)	14(93.33)	7(77.78)	1(100)	14(100)	1(100)	7(77.78)
Hmegaly	10(35.71)	11(52.38)	3(20)	3(33.33)	0	9(64.28)	0	1(11.11)
Smegaly	8(28.57)	11(52.38)	12(80)	2(22.22)	1(100)	7(50)	0	0
LNpathy	6(21.43)	4(19.04)	1(6.67)	4(44.44)	0	10(71.42)	1(100)	0
Bn pain	0	1(4.76)	0	0	0	0	0	1(11.11)
Petechiea Ecchymosis	0	1(4.76)	0	0	0	0	0	0
Others	3(10.71)	1(4.76)	1(6.67)	0	1(100)	0	0	0

Table 8: Distribution of subtypes of AML

SUBTYPE OF AML	NO. OF CASES	PERCENTAGE (%)
Mo	3	10.72
M1	6	21.43
M2	13	46.43
M3	3	10.72
M4	1	3.57
NOT TYPED	2	7.14
TOTAL	28	100

Table 9: Distribution of Subtypes of All

SUBTYPE OF ALL	NO. OF CASES	PERCENTAGE (%)
L1	9	42.85
L2	6	28.57
L3	2	9.52
NOT TYPED	4	19.04
TOTAL	21	100

Table 10: Laboratory Findings: Hemoglobin Values

Hb. VALUES ANAEMIA	AML n=28	ALL n=21	CML n=15	CLL n=9	HCL n=1	NHL n=14	HD n=1	MM n=9
<7.0gm%	20(71.42)	13(61.90)	2(13.33)	2(22.22)	1(100)	3(21.43)	0	2(22.22)
7.0- 10gm%	7(25)	4(19.05)	11(73.33)	4(44.44)	0	6(42.86)	1(100)	4(44.44)
MILD Lower Limit of n to 10gm%	0	2(9.52)	2(13.33)	3(33.33)	0	5(35.71)	0	3(33.33)
NORMAL FOR AGE AND SEX	1(3.57)	2(9.52)	0	0	0	0	0	0

Table 11: Laboratory Findings: Total Wbc Count

TOTAL WBC COUNT	AML n=28	ALL n=21	CML n=15	CLL n=9	HCL n=1	NHL n=14	HD n=1	MM n=9
< 4000/ cmm	5(17.85)	8(38.09)	0	0	1(100)	0	1(100)	0
4,0000 11,000/ cmm	5(17.85)	3(14.28)	0	1(11.11)	0	8(57.14)	0	6(66.67)
>11,000/ cmm	18(64.28)	10(47.62)	15(100)	8(88.89)	0	6(42.86)	0	3(33.33)

Table 12: Laboratory Findings: Platelet Count

PLATELET COUNT (LAcs/cmm)	AML n=28	ALL n=21	CML n=15	CLL n=9	HCL n=1	NHL n=14	HD n=1	MM n=9
<1.5	28(100)	17(80.95)	2(13.33)	6(66.67)	1(100)	6(42.86)	0	5(55.56)
1.50 4.5	0	4(19.05)	4(26.67)	3(33.33)	0	8(57.14)	1(100)	3(33.33)
>4.5	0	0	9(60)	0	0	0	0	1(11.11)

Table 13: Bone Marrow Aspiration in Haematological Malignancies

TYPE	NO. OF CASES	BONE MARROW DONE IN CASES	CELLULARITY			
			HYPER	NORMO	HYPO	DRY TAP
AML	28	20	20	0	0	0
ALL	21	14	11	0	1	2
CML	15	8	7	0	0	1
CLL	9	7	7	0	0	0
HCL	1	0	0	0	0	0
NHL	14	10	5	4	0	1
HD	1	0	0	0	0	0
MM	9	9	9	0	0	0
TOTAL	98	68	59	4	1	4

Table 14: Haematological Parameters (Mean Values) of Haematological Malignancies

LAB Feature	AML	ALL	CML	CLL	HCL	NHL	HD	MM
Hb gm%	5.85 (2.3- 12.4)	6.36 (2.0- 14.8)	8.4(4.7- 11.6)	8.5 (6.0- 11.8)	5.1	8.39 (4.8- 10.6)	7.9	7.99 (6.4- 10.4)
TLC /cmm	56, 150 (300- 2, 36, 000)	57, 910 (1, 100- 3.2lacs)	1, 55, 170 (44, 800- 2, 72, 400)	51, 912 (11, 000- 1, 61, 000)	2900	25, 876 (4200- 77, 000)	2500	12, 400 (5500- 26, 400)
PLT /cmm	36, 785 (<15, 000- 1.25lacs)	60, 000 (<15, 000- 3.15lacs)	4.08lacs (30, 000- 9.0lacs)	92, 000 (23, 000- 1.35lacs)	60, 000	1.78lacs (<15, 000- 3.90lacs)	2.25lacs	2.04 lacs (45, 000- 4.95 lacs)