

## Pattern of haematological malignancies among patients attending at the haematology department in a tertiary hospital

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### Abstract

**Background :** Hematological malignancies (HM) was comprise approximately 6.5% of all cancer incidences worldwide in 2012. Although prevalence of these malignancies are much lower in Asia and Africa then in Western countries. The incidence of these malignancies is drastically increasing in low-income settings. WHO predicts that the number of blood-related cancer cases would be increased about 48% in less developed countries by 2030 as compared to 2012.

**Objective :** In our study we tried to determine the current pattern of haematological malignancies among patients attending at the haematology department in a tertiary hospital.

**Methods :** This cross-sectional observational study was carried out in outpatients and inpatients department of Haematology, Dhaka Medical College Hospital, Dhaka from 13th August 2016 to 12th august 2017 for a duration of 12 months. Detail clinical history, examination findings and investigations of patients were recorded in a pre-designed case record form. All data were converted to tabulated forms to obtain statistical information by Using Microsoft Excel and SPSS 17 program.

**Results :** Out of 400 HM patients, most of them were male (66.75%) and remaining (33.25%) were female and male female ratio was 2.01:1. From rural were (71.25%) and remaining (28.75%) were urban population. Acute lymphoblastic leukaemia (ALL) patients were 87 (21.75%), mean age 25.4 years; Acute myeloid leukaemia (AML) patients were 81 (20.25%), mean age 36.5 years; Chronic myeloid leukaemia (CML) patients were 71 (17.75%), mean age 35.5 years; Non Hodgekin lymphoma (NHL) patients were 56 (14%), mean age 42.9 years; Acute promyelocytic leukaemia (APL) patients were 35 (8.75%), mean age 29.4 years; Multiple myeloma (MM) patients were 33 (8.25%), mean age 55.9 years; Hodgekin lymphoma (HL) patients were 24 (6.00%), mean age 33.8 years; Chronic lymphocytic leukaemia (CLL) patients were 7 (1.75%), mean age 61.9 years; Follicular lymphoma (FL) patients were 4 (1.00%), mean age 56.5 years; Mantle cell lymphoma (MCL) patient was 1 (0.25%), age 70 years and Burkitt lymphoma (BL) patient was 1 (0.25%), age 25 years.

**Conclusion :** Study result showed that acute leukaemias were more common than chronic cases. AML and APL (subtype of AML) were more than ALL. Individually APL was the 5th in position whereas ALL was the 1st and AML was the 2nd highest cases among the 11 types of HM found in this study. Percentage of CML was higher (3rd in position) than CLL (8th in position) among the studied cases. Among the lymphomas NHL was more common (4th in position) than HL (7th in position) and MM (6th in position). FL (subtype of NHL) which is low grade in nature was 9th in position among the eleven. MCL and BL was rare and each was 1 in number in this study.

**Key words :** Haematological Malignancies (HM), ALL, AML, CML, NHL, APL, MM, HL, CLL, FL, MCL, BL

DOI: <https://doi.org/10.3329/nimcj.v11i1.50735>

Northern International Medical College Journal Vol. 11 No. 1 July 2019, Page 415-418

### Introduction

Hematologic malignancies (HM) were accounted for 6.5% of all cancers around the world, including approximately 9.0% in the United States and Europe.<sup>1,2</sup> HM are the cancers of the blood and blood forming organs i.e. the bone marrow and lymphoid tissues. They are usually

clonal in origin and are quite often associated with Chromosomal abnormalities.<sup>3</sup> They may drive from either of the two major blood lineage: myeloid and lymphoid cell lines. The myeloid cell line normally produces granulocytes, erythrocytes, thrombocytes, macrophages and mast cells; the lymphoid cell produces B

lymphocytes, T lymphocytes, NK cells and Plasma cells. Lymphomas, Lymphocytic leukaemias and Myelomas are from the lymphoid line, while Acute and Chronic Myeloid leukaemias, Myelodysplastic syndrome's and Myeloproliferative diseases are myeloid in origin.<sup>4</sup>

These malignancies are induced by genetic damage or mutation in somatic cells, which can result from environmental agents such as chemicals, ionizing radiation and viral agents. The pattern of clinical presentation of these malignancies is variable and depends largely on the nature of the disease and it's extent. They have a worldwide distribution and can occur at all ages and in both sexes. Although, there are differences between the various types as regards the age and sex incidence, a changing pattern in the clinical presentation and distribution has been reported in various communities over the years.<sup>5-7</sup>

Acute leukaemias were reported to be the commonest form of leukaemias in Ethiopia, consisting 63.8% of all cases reviewed.<sup>8</sup> In the United States of America, it was reported that haemopoietic malignancies accounted for approximately 6-8% of cancer incidence in both sexes, the incidence of acute leukaemas being about 34 per million populations.<sup>9</sup>

The exact causes of most Haematological malignancies remain unknown, comparison of incidence pattern by disease subtype may provide critical clues for future etiologic investigations.

**Materials and Methods**

This Cross-sectional observational study was carried out in outpatients and inpatients department of Haematology Dhaka Medical College Hospital, Dhaka during 13<sup>th</sup> August 2016 to 12<sup>th</sup> august 2017 for duration of 12 months. Following purposive sampling a total 412 HM patients attended in outpatients and inpatients department, among them 12 cases were excluded as per study selection criteria. Finally, sample size was 400.

**Inclusion criteria:**

- All haematological malignancies.
- Ages 10 years to 81 years and both sexes.
- Both old and new cases.

**Exclusion criteria:**

- Doubtful diagnosis of haematological malignancies.
- Non haematological malignancies.

Detail clinical history, examination findings and investigations of patients were recorded in a pre-designed case record form. All data were converted to tabulated forms to obtain statistical information by Using Microsoft Excel and SPSS 17 program.

The research protocol was approved by the ethical committee of Dhaka medical college hospital. The aim and objectives of the study along with its procedure, methods, risks and benefits of this study were explained to the patient and his/her respondent's guardian in easily understandable local language

and then informed consent was taken from each patient or legal guardian for ethical consideration. The patient and his/her respondent's guardian assured to that all records would be kept confidential.

**Results**

In this study a total of 400 patients of haematological malignancies were analyzed. According to age, all patients were divided in four groups, 10-29 years, 30-49 years, 50-64 years and 65-81 years. Most of the patients, 157 (39.25%) were in the range of 10-29 years and minimum patients 33 (8.25%) were in the range of 65-81 years. Haematological malignancies were higher in male (66.75%) than female (33.25%) and male female ratio was 2.01:1. Patients from Rural were 285 (71.25%) and remaining 115 (28.75%) from Urban. Rural to urban ratio was 2.48:1 (Table I).

**Table I : Distribution of patients according to Socio-demographic character**

Age (Years)	Frequency (n)	Percentage (%)	
10- 29	157	39.25	
30-49	140	35	
50-64	70	17.5	
65-81	33	8.25	
Gender	Male n (%)	Female n (%)	Male to female ratio
400	267(66.75)	133(33.25)	2.01:1
Residence	Rural n (%)	Urban n (%)	Rural to urban ratio
400	285(71.25)	115(28.75)	2.48:1

In our study, ALL patients were 87 and their mean age was 25.4 years (age range- 13 to 70 years). AML were 81 patients where mean age was 36.5 years (age range- 13 to 79 years), CML patients were 71 and their mean age was 35.5 years (age range- 14 to 68 years), CLL patients were 7 where mean age was 61.9 years (age range- 45 to 70 years), APL patients were 35 where mean age was 29.4 years, NHL patients were 56 where mean age was 42.9 years, HL patients were 24 where mean age was 33.8 years, MM patients were 33 and their mean age was 55.9 years, FL patients were 4 where mean age was 56.5 years, MCL and BL patient was 1 in each group where age was 70 and 25 respectively (Table II).

**Table II : Age specific distribution of HM**

HM Types	Number of cases	Mean age	Range (Min-Max)
ALL	87	25.4	13-70
AML	81	36.5	13-79
CML	71	35.5	14-68
NHL	56	42.9	12-75
APL	35	29.4	14-65
MM	33	55.9	38-81
HL	24	33.8	14-60
CLL	07	61.9	45-70
FL	04	56.5	45-66
MCL	01	70	70
BL	01	25	25

In this study ALL patients were 87 (21.75%), AML patients were 81 (20.25%), CML patients were 71 (17.75%), CLL patients were 7 (1.75%), APL patients were 35 (8.75%), NHL patients were 56 (14%), HL patients were 24 (6.00%), MM patients were 33 (8.25%), FL patients were 4 (1.00%), MCL patient was 1 (0.25%) and BL patient was 1 (0.25%) (Figure I).

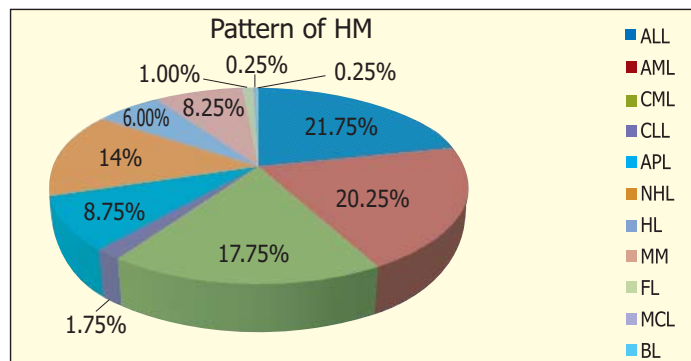


Figure I : Distribution of patients according to HM.

## Discussion

This study was done to determine the current pattern of Haematological malignancies in the study area. Among 400 study cases most of the patient 267 (66.75%) were male. The higher prevalence of HM in males might be the result of increased exposure to environmental and occupational risk factors, smoking, alcohol consumption as well as different hormonal and genetic background.<sup>10,11</sup>

In this study patient from rural area was higher 285 (71.25%) than urban area. Patient of rural to urban ratio was 2.48:1. In Bangladesh, over 70% of the population live in rural areas, most of the tertiary health care facilities for HM treatment are centered in the capital city, Dhaka.<sup>12</sup> Therefore, patients seeking treatment for HM travel to Dhaka and enter into government hospital like Dhaka medical college hospital due to their weak financial condition.<sup>12</sup>

Among the acute leukaemias AML including APL and ALL are the most prevalent HM affecting our population found in this study. ALL was 21.75% (n=87) mean age- 25.4 years, AML 20.25% (n=81) mean age-36.5 years and APL 8.75% (n=35) mean age-29.4 years, while these constituted 50.75% (n=203) of all HM cases (Table-II and Figure-I). The frequency of AML including APL was slightly higher than that of ALL in this study. Another study done in Bangladesh showed that AML was two times higher than that of ALL.<sup>2</sup> Another study showed that Acute myeloid leukaemias are being three times more common than acute lymphoblastic leukaemia.<sup>8</sup>

This study also showed that acute leukemias tend to affect relatively young adults. The mean age of onset for AML was 36.47 years including APL 35.5 years and ALL 25.38 years (Table II). A study showed that the median age of onset for AML was

35 years in Bangladesh, which was higher than that of India.<sup>13</sup> Apart from lower life expectancy prevailing in the Indian subcontinent, it is likely that elderly patients may not be reporting to the hospitals because of relatively rapid progression of AML.<sup>14</sup> APL was the fifth HM burden in Bangladesh according to this study (Table II). ALL occur in people of all ages but it exhibits bimodal age-specific curve with peak in youngest (<20 years) and older age (>50 years). In this study mean age was 25.38 years (Table II). In USA, approximately 60% of the cases occur in children under 20 years old.<sup>14</sup>

In this study we found that CML was the third most common type (17.75%, n=71), while CLL was the least frequent (1.75%, n=07) HM except some indolent lymphoma such as FL, MCL and BL (Table II and Figure I). The frequency of CML was higher than CLL. The pattern of CML occurrence is different in India and Africa where it is the most common form of leukemia.<sup>13,15</sup> In Sudan, the incidence of CML is very high, being the predominant cancer in men in last 25 years.<sup>16</sup> CLL is a rare hematological malignancy in Asia while this is the commonest form of leukemia affecting elderly in Western countries.<sup>17</sup> In Bangladesh and India, CLL is found to occur mainly in adults (median age~60 years).<sup>18</sup>

Malignant lymphoma constituted 20% of all HM in this study (Figure I). The frequency of NHL and HL observed in the present study was almost similar to the earlier report from Bangladesh. In that study, malignant lymphoma constituted 20.8% of all HM.<sup>2</sup> Out of 1052 lymphoma cases, NHL accounted for 80.4% while 19.6% was for HL.<sup>2</sup> NHL is one of the commonest cancers in developed countries, but the incidence is relatively lower in Asia.<sup>19</sup> On the other hand HL is the most common cancer of young adults in developed countries. The age distribution of HL is bimodal, the first being young adults (age 15–35 years) and the second being those in older individuals over 55 years old.<sup>20</sup> In this study, mean age of diagnosis was 33.75 years (Table II). The similar frequency of HL pattern was also observed in India where mean age of diagnosis was 31.9 years.<sup>21</sup>

There was no previous data found in Bangladesh regarding indolent NHL. In this study, indolent NHL constituted about 1.5% of all HM (Figure I). FL patients were 4 in number and their mean age was 56.5 years and age range was 45 to 66 years, MCL and BL patient was 1 and 1 in number and age was 70 and 25 years respectively (Table II).

In this study, the mean age of MM patients was 55.9 years. This accounted for 8.25% of all HM (Table II). A study showed that nearly 76.7% of the MM patients aged over 50 years. This accounted for 10.5% of all HM. In Western countries, the median age at diagnosis is 65–70 years, which is significantly higher as compared to Asian countries like India, Japan and China.<sup>22</sup>

## Conclusion

In this study we found more acute leukaemias than chronic cases and it is predominantly occur in the younger age. AML and APL were more than ALL. Individually APL was the 5<sup>th</sup> in position where ALL was the 1<sup>st</sup> and AML was the 2<sup>nd</sup> in position among the eleven varieties of haematological malignancies. More common chronic leukaemia was CML which was 3<sup>rd</sup> in position another one was CLL which was 8<sup>th</sup> in position. Among the lymphomas NHL was more common than HL and MM was in 6<sup>th</sup> position. FL was in 9<sup>th</sup> position. MCL and BL was rare.

Though this is a study with small number of patients, but yet a step in understanding the pattern of Haematological malignancies in Bangladesh. HM are increasing day by day, therefore, further large scale multi-center studies are necessary to understand the new epidemiology and pattern of haematological malignancies.

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