



## Pattern of hematological malignancies in adolescents and young adults in Bangladesh



Md. Mahbub Hasan<sup>a,b</sup>, Enayetur Raheem<sup>a</sup>, Tanvira Afroze Sultana<sup>a</sup>,  
 Mohammad Sorowar Hossain<sup>a,c,\*</sup>

<sup>a</sup> Biomedical Research Foundation, House # 7, Apartment # 1A, Road # 1/B, Chairman Bari, Banani, Dhaka 1213, Bangladesh

<sup>b</sup> Department of Genetic Engineering and Biotechnology, Faculty of Biological Sciences, University of Chittagong, Chittagong 4331, Bangladesh

<sup>c</sup> School of Environmental Science and Management, Independent University, Bangladesh

### ARTICLE INFO

#### Keywords:

Adolescents and young adults  
 Leukemia  
 Lymphoma  
 Hematological malignancy  
 Bangladesh

### ABSTRACT

**Introduction:** The adolescent and young adult (AYA) age group (15–39 years) bears distinct characteristics in terms of cancer biology, long-term health and treatment-related complications and psychosocial aspects. The overall scenario of cancer including hematological malignancies (HMs) is largely unknown in Bangladesh, where a significant proportion of people (44% of total population) belong to AYA age group. This study aims to describe the patterns of HM among AYA in the context of Bangladesh

**Methods:** Two previously published datasets (on hematological malignancies and childhood and adolescent cancer) were merged to construct a comprehensive dataset focusing exclusively on HMs in AYA age group. Univariate descriptive statistics were calculated and bivariate association were tested using Pearson's Chi-square test.

**Results:** A total of 2144 diagnosed HM related cases over a period of 2007–2014 were analyzed. Acute myeloid leukemia (AML) was the most frequent HM (35.1%) in AYAs, which was followed by acute lymphoblastic leukemia (ALL) and chronic myeloid leukemia (CML) constituting 22.7% and 20.8%, respectively. Among lymphomas, Non-Hodgkin lymphoma (NHL) constituted 13.9% of all HMs while 4.6% was for Hodgkin's lymphoma (HL).

**Conclusion:** This is the first attempt to provide a glimpse on the pattern and distribution of HMs among AYA in Bangladesh. Future studies are essential to get a better insight on the epidemiology, biology, potential risk factors and treatment outcomes for the AYA age group.

### 1. Introduction

Cancer incidence and survivors of cancer among adolescent and young adult (AYA) (aged 15–39 years) are different from pediatric and adult cancer populations in the perspective of cancer biology, long-term health and treatment-related complications and psychosocial aspects [1–3]. Importantly, the number of life-years affected by cancer among AYA is significantly higher considering any other age groups [4].

Due to the fact that more than one million (7.4% of all cancers) adolescents and young adults are diagnosed with cancers each year globally, cancers in this particular age largely understudied or neglected by pediatric and adult oncologists. This perception is present even in high-income countries (HICs) [2]. Arguably, the scenario would be much worse in low- and middle-income countries (LMICs). Due to a higher burden of communicable diseases in LMICs, the overall aspects of chronic diseases like cancer epidemiology, cancer care and

management get less priority both at policy and research level. Approximately 10% of all new cancer cases and 70% of their deaths have been estimated to occur in 15–39 age group in low- and middle-income countries while about 4% new cases and 50% of their deaths occur in high-income countries [5]. According to GLOBOCAN 2012 estimates, in HICs, the age-standardized incidence rate (ASR) is 58.4 per 100,000 for both sexes among AYA whereas it is 33.8 for LMICs. Interestingly, the ASR of SAARC (South Asian Association for Regional Cooperation) countries (which provide habitat for nearly 24% of world population) is 24.5 per 100,000 among AYA, possibly because of under-ascertainment, indicating inadequate cancer care system in these countries [5,6].

Hematological malignancies (HMs) comprise a significant proportion of all AYA cancers accounting for nearly 13% of all AYA cancer burden [5]. The reported incidence rate of HMs in HICs (ASR 8.2 per 100,000) is nearly double than in LMICs (ASR 4.5 per 100,000) among AYAs. In HICs, the proportion of lymphomas is significantly higher (2.5

\* Corresponding author at: Biomedical Research Foundation, House # 7, Apartment # 1A, Road # 1/B, Chairman Bari, Banani, Dhaka 1213, Bangladesh.  
 E-mail addresses: [sorowar.hossain@brfbd.org](mailto:sorowar.hossain@brfbd.org), [sorowar2002@gmail.com](mailto:sorowar2002@gmail.com) (M.S. Hossain).

**Table 1**  
Diagnostic distribution of haematological malignancies distributed by age: diagnosed 2007–2014.

HMs	Age Group (years)					Total	Male to Female ratio
	15–19	20–24	25–29	30–34	35–39		
ALL	94 (30.7%)	163 (30.9%)	110 (22.4%)	75 (18.2%)	45 (11.0%)	487 (22.7%)	2.5:1
AML	103 (33.7%)	169 (32.0%)	169 (34.5%)	160 (38.8%)	151 (37.0%)	752 (35.1%)	1.8:1
CML	37 (12.1%)	95 (18.0%)	98 (20.0%)	106 (25.7%)	110 (27.0%)	446 (20.8%)	2.2:1
CLL	2 (0.7%)	1 (0.2%)	2 (0.4%)	2 (0.5%)	7 (1.7%)	14 (0.7%)	2.5:1
HL	24 (7.8%)	29 (5.5%)	14 (2.9%)	20 (4.9%)	11 (2.7%)	98 (4.6%)	3.1:1
NHL	43 (14.1%)	63 (11.9%)	85 (17.3%)	38 (9.2%)	68 (16.7%)	297 (13.8%)	4.5:1
MM	1 (0.3%)	3 (0.6%)	3 (0.6%)	5 (1.2%)	9 (2.2%)	21 (1.0%)	2.7:1
MDS	2 (0.7%)	5 (0.9%)	9 (1.8%)	6 (1.5%)	7 (1.7%)	29 (1.4%)	1.2:1
Total	306 (100.0%)	528 (100.0%)	490 (100.0%)	412 (100.0%)	408 (100.0%)	2144 (100.0%)	2.3:1

times) than leukemias while the frequency of these two hematological cancer categories is similar in LMICs in AYA age group [5]. A recent study has shown that AYAs had significantly poorer survival rate than children with hematological malignancies including leukemias and lymphomas [7]. A number of factors such as delayed diagnosis, unique cancer biology, fewer or no clinical trials, lack of specific treatment protocols have been attributed to the poor improvement of survival rates for cancers in AYA [2].

To date, only a few hospital-based epidemiological reports are available [8–10] for the Bangladeshi population. Our previous studies mostly focused on the epidemiology of cancers in children and adults [8,10]. Approximately 70 million (44% of total population) people belong to AYA age group in Bangladesh [6]. Moreover, 60.77% of the economically active people are in the 15–39 years age-group [11]. Irrespective of the relative distribution of the various hematological malignancies, it must be noted that among the entire population, AYAs represent a significant percentage of the patients. However, due to the nonexistence of population-based cancer registries, the overall picture of cancer is unknown in this populous nation. Based on GLOBOCAN estimate, ASR of HM in Bangladesh is 2 per 100,000, which is relatively low (about 45%) as compared to the average ASR of LMICs (4.5 per 100,000) [5]. This article aims to draw attention towards this specific age group and to create awareness about their needs in respect of selection of treatment regimens, addressing therapy related complications and focusing on various concerns related to overall support systems from the society. To highlight the importance of AYA specific cancers, we report, for the first time, on the pattern of hematological malignancies among AYA in the perspective of Bangladesh.

## 2. Materials and methods

Researchers have considered different age ranges to define adolescents and young adults. In the present study, we used the definition of AYAs (age 15–39 years) as considered by the US National Cancer Institute [12]. We used two datasets (hematological malignancies dataset and childhood and adolescent dataset) to construct a comprehensive dataset that exclusively focused on HMs in AYA age group [8,10]. Data were collected over a period of 2007 to 2014 from 11 different tertiary level hospitals mostly located in Dhaka, except two hospitals outside of Dhaka city. Like other developing countries, medical record keeping system is often incomplete and therefore the exact geographic locations of patients were mostly unavailable. The detailed description data collection has been discussed in earlier published papers [8,10]. Diagnosis of HMs was made based on clinical features, blood counts, peripheral blood films and bone marrow morphology including cytochemical staining, and immunocytochemistry [8,10].

We merged the data sets using statistical software in order to maintain the data integrity and avoid potential duplication. The final dataset yielded 2144 individual cases of HMs under 15–39 years age group. Statistical analysis was performed with R Statistical Package [13] Version 3.3.2 in Windows environment. Univariate and bivariate

analysis were performed. Descriptive statistics such as counts and percentages were reported. Bivariate association was evaluated using Pearson's Chi-square test. When the expected numbers were small, Fisher's exact test was used.

## 3. Results

A total of 2144 diagnosed hematological malignancy related cases among AYAs extracted over a period of 2007–2014 from 11 different tertiary hospitals were included in this study. Of all the AYA patients, 1497 males accounted for 70% while 647 female patients accounted for 30%. Overall, there was a significant association between sex and age groups in terms of the occurrence of HMs (Pearson's Chi-squared: 12.6,  $p=0.013$ ). There were 306 cases of HMs in adolescents (15–19 years) with a male to female ratio of about 2.3:1. On the other hand, 1838 HM cases were diagnosed in young adults (20–39 years). Male preponderance of HM among the 20–24 years age group was not statistically significant (Fisher's exact test,  $p=0.114$ ).

Among the patients receiving treatment from hematology departments acute myeloid leukemia (AML) was the most frequent HM (35.1%) in AYAs, which was followed by acute lymphoblastic leukemia (ALL) and chronic myeloid leukemia (CML) constituted 22.7% and 20.8%, respectively. Among lymphomas, Non-Hodgkin lymphoma (NHL) constituted 13.9% of all HMs while 4.6% was for Hodgkin's lymphoma (HL). As expected, three hematological cancers including chronic lymphocytic leukemia (CLL), myelodysplastic syndromes (MDS), and multiple myeloma (MM) were diagnosed rarely among AYAs in Bangladesh (Table 1).

## 4. Discussion

To the best of our knowledge, this is the first report on the pattern and distribution of cancer exclusively focusing on the AYA age group (15–39 years) in Bangladesh. Our study has revealed that leukemias (79%) were the most common HMs in AYAs while lymphomas comprised of approximately 18% of all HMs. According to WHO estimates, this pattern appears to be the reverse of that reported in more developed countries, where lymphomas are the most frequent (70%) type of HMs in AYA [5]. In general, the incidence of leukemias is significantly higher in Asian countries. The proportions of leukemias and lymphomas incidences are found to be equally distributed in India (54.8% versus 43%) and other South-east Asian countries (55.8% versus 42.4%) in AYAs [5]. Lack of proper referral system in some participating centers might contribute to the unexpected higher prevalence of leukemias in AYAs in Bangladesh. It is possible that a small number of lymphomas cases might have been registered at the medical oncology department instead of respective hematology department. In order to know the actual pattern and distribution of HMs among AYA in Bangladesh, data from population-based studies are necessary.

Myeloid leukemias including AML and CML are the most prevalent leukemias among AYAs in Bangladesh, accounting for approximately

Download English Version:

<https://daneshyari.com/en/article/8433017>

Download Persian Version:

<https://daneshyari.com/article/8433017>

[Daneshyari.com](https://daneshyari.com)