Incidence of adult hematological malignancies in Benghazi Libya

Mohamed Lateiwish, Muftah Elsahati, Abdulhadi Haweel

Abstract
Introduction The hematological malignancies are a group of neoplasms that arise through malignant transformation of bone marrow derived cells. The great diversity seen in this group of disorders is a reflection of the complexity of normal haematopoiesis and the immune system. Aim of the study to estimate the pattern and the incidence rate of the hematological malignancies among Libyan population in Benghazi in the year 2009. Material and Method A retrospective study was carried out in ‘hematology unit – Jamhoria hospital – Benghazi (the only hematological unit). The data was extracted from the files of hematological malignancy patients who were diagnosed in the year 2009. SPSS was used for data analysis. Statistics used; mean, standard deviation, median and percentages. Incidence rates among the patients were also calculated. Results 71 cases of hematological malignancies were registered in the year 2009 in the hematology unit at Jamhoria Hospital. The overall incidence rate of the hematological malignancy among Libyan population in Benghazi was 17.74 per 100000, the most frequent malignancy was Non-Hodgkin lymphoma (25.3% of all the cases) and its incidence rate was 4.5 per 100,000 population. Acute lymphocytic leukemia, idiopathic myelofibrosis and Waldenstrom’s macroglobulinemia had the lowest frequencies (each 1.41%) and incidence rates (each 0.25 per 100,000 population). In conclusion, the distribution of the various hematological malignancies in this study is similar to the pattern that reported in other studies, and the incidence rates of various hematological malignancies seem to be lower than that recorded in other studies.

Key Words Hematological malignancies, Incidence rate.
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Introduction
The Hematological Malignancies (HMs) are a group of neoplasm that arises through malignant transformation of bone marrow derived cells. The great diversity seen in this group of disorders is a reflection of the complexity of normal haematopoiesis and the immune system. HMs, like other malignant disorders carry considerable morbidity and mortality, hence significant social and economic consequences (1). Assessing the magnitude of the problem among the population is essential for planning and implementing a cost-effective services for patients’ management. Benghazi is the second largest city in Libya and it is the principal city of Eastern Libya, with an area of 16,809 sq mi (43,535 km2). The city is located near the coastal plain. The city is surrounded by desert on three sides. The Mediterranean Sea is also located near to the city. The northern part of the city is surrounded by plateaus and rugged landscape. According to 2006 census Benghazi population (Libyan) was 622847. Herein, we conduct this study with the aim to estimate the pattern and the incidence rate (IR) of the HMs among Libyan population in Benghazi in the year 2009.

Subjects and methods
A retrospective study was carried out in Hematology unit – Jamhoria Hospital – Benghazi (the only hematological unit) The data was extracted from the files of hematological malignancy (HM) patients who were diagnosed in the year 2009. SPSS was used for data analysis. Statistics used; mean, standard deviation, median and percentages. Incidence rates (IRs) among the patients were also calculated in the mid-year of 2009, Benghazi population (Libyan) was 656480.738 (this data obtained from Benghazi population in 2006 with using of projection equation). As 60.95% of the population was ≥15 years, Benghazi adult population (Libyan) was 400125.0098 (this used as the denominator in calculating the IRs).

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Results

During the year 2009, 71 patients were diagnosed with 12 different types of HMs (fig.1). The age of the patients was ranged from 18 to 100 years. The median age was 54 years (table1). The overall IR of the HM was 17.74 /100,000 population. IRs of HMs per 100,000 population were as follows: Non-Hodgkin’s lymphoma (NHL) 4.5, Hodgkin’s disease (HD) 2.25, acute myeloid leukemia (AML) 2.0, chronic lymphocytic leukemia (CLL) 1.75, multiple myeloma (MM) 1.75, myelodysplastic syndrome (MDS) 1.75, chronic myeloid leukemia (CML) 1.25, essential thrombocytosis (ET) 1.25, polycythemia rubra vera (PRV) 0.5, acute lymphocytic leukemia (ALL) 0.25, aldenstrom’s macroglobulinemia (WM) 0.25 and idiopathic myelofibrosis (MF) 0.25 (fig.2). The most frequent malignancy was NHL (25.35%) and the least frequent malignancies were ALL (1.41%), WM (1.41%) & IMF (1.41%) (fig.1). Fig. (3) shows the distribution of patients according to the types of HMs—lymphoma (NHL & HD) (38.02%), leukemias (AML, CLL, CML & ALL) (29.58%), myeloproliferative disorders (MDS, PRV, ET & IMF) (21.13%) and plasma cell disorders (MM & WM) (11.27%). Fig. (4) shows the distribution of the lymphoma cases according to the type (NHL = 66.67% & HD = 33.33%). Fig. (5) shows the distribution of leukemia cases according to the type (AML = 38.10%, CLL = 33.33%, CML = 28.81% & ALL = 4.76%). Fig. (6) shows distribution of the cases with plasma cell disorders according to the type (MM = 87.50% & WM = 12.50%). Fig. (7) shows distribution of the cases with myeloproliferative disorders according to the type (MDS = 46.67%, ET = 33.33%, PRV = 13.33% & IMF = 6.67%).

Discussion

Comparison of the results in the current study will be with the IR of HMs in developed countries. A total of 71 cases of HMs were recorded at the haematology unit – Jamhoria hospital (teaching hospital) – Benghazi, during the year 2009 with 12 types of different HMs (fig.1). The IR of the HMs was 17.74 /100,000 population. NHL accounted 25.35% of all cases of HMs (1st frequent type of HMs) and HD accounted for 12.68% of all cases of HMs (2nd frequent type of HMs) (fig.1). The above results were in agreement with other studies (2). In the Middle East Cancer Consortium (MECC) registries, multiyear averages showed very high IR for lymphoma in Egyptians (16.3/100,000). This rate exceeded the United States of America (USA) Surveillance, Epidemiology and End Results (SEER) IR (15.3/100,000) – considered one of the highest in the world – as well as the rates of the other MECC populations (3, 4). IR of NHL was also higher among Egyptians (14.2/100,000) than in the other MECC populations and the US SEER IR (12.4/100,000), also considered one of the highest worldwide (3, 4). Among MECC registries, the IR of HD was high in Cypriots (3.0/100,000) and low in Egyptians (2.1/100,000) (3). The HD IR in USA SEER (2.4/100,000) (4), Jordan (2.5/100,000) (3) and Europe (2.4/100,000) were intermediate (2). In comparison with the above mentioned IRs, Benghazi IR was low in NHL (4.5/100,000) and intermediate in HD (2.25/100,000) (fig.2). Worldwide, over 250,000 people are diagnosed with leukemia each year, accounting for 2.5% of all cancers. CLL is the most common leukemia in Western countries accounting for approximately 30% of all leukemias in the USA (5). In the USA, in the 2004-2008 time period, the CLL IR was 4.2/100,000/year (4). In Europe, in the 2000-2003 time period, the CLL IR was 3.79/100,000/year (2). The incidence of CLL in Japan is at least 4–5 times lower than that in Western countries (6). In comparison with the above CLL IRs, the IR Of CLL in the current study (1.75/100,000) (fig.2) was low. AML is the most common of leukemias in Benghazi and accounts for 38.10% of leukemia cases in our group (fig.5), in contrast to Western coun-

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Myeloproliferative lymphoma

Distribution of hematological malignancies

Fig (3): Distribution of the patients according to the types of hematological malignancies

- Lymphoma: 38.02%
- Leukemia: 29.56%
- Plasma cell disorders: 9.54%
- Myeloproliferative disorders: 12.90%

Fig (4): Distribution of the lymphoma cases according to the type.

- HD: 66.67%
- NHL: 33.33%

Fig (5): Distribution of leukemia cases according to the type.

- CLL: 4.76%
- CML: 33.33%
- AML: 23.81%
- ALL: 30.17%

Fig (6): Distribution of the cases with plasma cell disorders according to the type.

- MM: 87.50%
- WM: 12.50%

Countries where CLL is the most common (5). In the USA and Europe, the incidence has been stable at 3 to 5 cases per 100,000 populations (2, 7). Worldwide, the incidence of AML is highest in the USA, Australia, and Western Europe (6). Benghazl IR of AML (2/100,000) (fig.2) is lower than that mentioned USA and Europe. CML represents about 14% of all leukemias with a fairly uniform incidence globally, affecting about 0.6-2 per 100,000 people per year (9). In USA, the IR is 1.6/100,000 people per year (10). In Europe, the IR is 1.67/100,000 people per year (2). Our CML IR (1.25/100,000) (fig. 2) is lower than that reported in USA and Europe. In adults, ALL is less common than AML. In the USA, the age-adjusted IR was 1.7 per 100,000 men and women per year (4). About 10,000 new cases are diagnosed in adults in Europe each year, with IRs between 2 to 4 per 100,000/year, roughly similar to the rates in other developed continents (1). In the current study, the IR of ALL (0.25/100,000) (Fig. 2) is lower than that in developed countries. In USA, from 2003 to 2007, an average of 11,954 new cases of MDS was diagnosed per year. The overall IR of MDS was 4.3/100,000 population (11, 12). In Europe, the IRs from different countries were as follows: France (7.7/100,000) (13), Germany (4.1/100,000) (14), Sweden (3.5/100,000) (15) and England (12.6/100,000) (16). In our study the IR (1.75/100,000) (fig. 2) is lower than that of USA and European countries. Worldwide IRs of MM vary from 0.4 to 5 per 100,000 person-years, with rates being higher in Western than in Asian countries (17). There is an increased incidence of MM in the West Indies (5/100,000) and this is double that observed in France, Italy or Europe (around 2 to 3/100,000) (18). A similarly high incidence of MM has been reported among Afro-Americans in the USA, where the IR of MM is about twice as high for blacks (9.3/100,000) as for whites (4.3/100,000) (19). In the current study, the IR of MM (1.75/100,000) (fig. 2) is low in comparison with the above results. WM is considerably less frequent than MM, with an estimated incidence rate of between 0.36 and 0.55 cases per 100,000 person-years at risk in the EU and USA (20-23). In our study only one case of WM was diagnosed IR = 0.25/100,000 (FIG. 2). In USA the IR of PV to be 2.3 per 100,000 persons per year (24). In southeast England, the IR of PV was 1.08/100,000, that of ET 1.65/100,000 and IMF 0.37/100,000 (25). In the city of Göteborg (Sweden), the yearly calculated incidence for PV was 2.8 per 100,000 population, for ET and IMF the corresponding figures were 1.5 and 0.4, respectively. The results for PV demonstrated the highest IR reported in literature so far (26). In comparison with the above results, our IRs of PV (0.5/100,000), ET (1.5/100,000) and IMF (0.25/100,000) (fig. 2) were low. In conclusion, the distribution of the various HMs in this study is similar to the pattern that reported in other studies, and the IRs of various HMs seem to be lower than that recorded in other studies.

Abbreviations

HEMATOLOGICAL MALIGNANCIES (HMs), HEMATOLOGICAL MALIGNANCY (HM), INCIDENCE RATES (IRs), INCIDENCE RATE (IR), NON-HODGKIN’S LYMPHOMA (NHL), HODGKIN’S DISEASE (HD), ACUTE MYELOID LEUKEMIA (AML), CHRONIC LYMPHOCYTIC LEUKEMIA (CLL),
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<th>Type of hematological malignancy</th>
<th>Minimum age</th>
<th>Maximum age</th>
<th>Mean</th>
<th>SD</th>
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</table>

**Fig (7):** Distribution of the cases with myeloproliferative disorders according to the type.

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