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Blood Malignancies: Case of Iran

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Abstract: History and purpose: Malignancy diseases are the Second cause of mortality in many countries that in these cases leukemia and lymphoma happen significantly incidence rates throughout the world particularly in Iran which cause remarkable mortality and serious diagnosis and treatment expenditures for both families and health system. Leukemia and lymphoma totally include about 11 percent of cancers in Mazandaran province by this regard they are in the second rank of prevalent cancers in this province. The purpose of this study is a general and specific description of leukemia and lymphoma in Mazandaran province which has not been implemented yet. *Materials and methods*: In this study, entire patient's data have been reviewed which have had certain diagnosis of leukemia and lymphoma with valid laboratory or pathology reports since 2001-2008. This data is collected by Babol health research site related to Tehran University of Medical Science. This research is a descriptive retrospective study. In this study, incidence rates based on age groups, gender, city of residence and type of malignancy have been calculated and analyzed. *Findings*: In Mazandaran province, 1146 cases of leukemia and lymphoma have been realized since 2001-2008. Leukemia and lymphoma occurs 5.9 in 100000 persons in average annually. The most incidence rates obtained at age of 70 or above (26.4) and the least ones were at age of 0-9 (2.3).The incidence rates in males and females are 7.1 and 4.8 respectively and the male to female's incidence ratio is 1.5. The most incidence rate is in Babol (7.3) and the least one is calculated in Neka and Tonekabon equally (1.5). According to the type of malignancy, non Hodgkin lymphoma, with 2.5 in 100000 have the most incidence rate and myeloid leukemia with 1.8 in 100000 have the least incidence rate. *Conclusion:* Given findings indicates clear differences of incidence rate based on age, gender, residence and type of malignancy. Therefore it's suggested that in addition to promote data collecting program, research projects should be programmed to define leukemia and lymphoma risk factors in this province.

Key words: Leukemia · Lymphoma · Blood malignancy · Incidence · Mazandaran

INTRODUCTION

Neoplastic disease are the second cause of death in most developed countries in the world, these diseases are the most terrible diseases today. In the among of them, leukemia and lymphoma have remarkable incidence in the world and Iran, especially in Mazandaran province of Iran. These diseases are seen in all age groups and cause remarkable mortality, so have a lot of diagnosis and treatment costs for families and health care system. Leukemia and lymphoma make up about 11.1% of all cancers in Mazandaran province and in this case are the second most common cancer in the province [1].

Leukemia and lymphoma are neoplastic diseases of the hematopoietic and immune systems with various clinical and pathological presentation and a wide range of factors, including genetic factors, physical and chemical exposures, infectious agents and other environmental factors have mentioned [2,3].

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Myeloid leukemia is a heterogeneous group of hematopoietic system neoplasm by infiltration of neoplastic cells into the blood, bone marrow and other tissues. This disease is identified and classified into acute and chronic types. [4,2] Malignant lymphoid cells are variable from very silent to very aggressive types. These cancers are created from the immune cells in different stages of their differentiation.

Some of the malignant lymphoid cells almost always are present in the leukemia and can be divided into acute and chronic types. Other malignant lymphoid cells such as solid tumors of immune systems are almost always present lymphoma.

Two important groups of these diseases are Hodgkin's disease (HD) and Non Hodgkin lymphoma (NHL) (2 to 4). Given that up to now, don' t study in description leukemia and lymphoma in Mazandaran province that show general and specific status of these diseases and due to the presence of cancer registration system in the north of the Iran in Babol Research Station(dependent to Tehran University of Medical Sciences), this research is achieved in partnership with station. Because of this study is the first comprehensive and detailed review of the rates of leukemia and lymphoma in accordance to ages groups, sex, incidence of year and city of residence, so the results of this study can be the basis for estimating of blood malignancies (leukemia and lymphoma) in Mazandaran province which is the basis to etiologic studies to ultimately reduce the burden of disease and improve health and reduce the years of life lost.

MATERIALS AND METHODS

This research is descriptive, cross sectional and retrospective study. In this research, the information of all patients of Mazandaran province for seven years that referred to one of the centers of pathology, cellology, oncology, chemotherapy and radiotherapy of private and public sectors in Mazandaran province and have a valid pathology or laboratory report of leukemia and lymphoma were studied. Repeated cases, double cases (overlapping) and cases with imperfect data were deleted. Data were collected by cancer registries form of Tehran University of Medical Sciences. These data consist of age, residence, race, religious and center or the doctor who was reported. Since Mazandaran province in religious and race have a homogenous population, these two variables were not studied.

In this study, the latest official census in the Mazandaran province and related city has been used. These population were used according to10 years old ages groups (8 ages groups), sex (male & female) and city of residence (15 city). According to ICD-10 classification, the blood malignancies are two general categories: leukemia and lymphoma. In leukemia group, lymphoid leukemia and myeloid leukemia and, in lymphoma group, Hodgkin's disease (HD) and Non Hodgkin lymphoma (NHL) were studied. To statistical analysis, the incidence of these diseases has been used and to eliminate of the age variable effect, the standardized morbidity ratio (SMR) was calculated and used.

RESULTS

In Mazandaran province, 1146 cases of leukemia and lymphoma have been realized since 2001-2008, then incidence rates based on age groups, gender, city of residence and type of malignancy have been calculated and analyzed.

Age Groups: Trend of increase in incidence of blood malignancies with increase age was seen. So that age groups of 70 years and above, with annual incidence 26.4per 100000, have shown the highest incidence rate and age group of 0 to 9 years with annual incidence 2.3 per 100000 have shown the lowest incidence rate (Figure 1).

Gender: Annual incidence rate of these malignancies in men was7.5per 100000 and in woman was 4.8 per 100000. The incidence ratio of male to female was 1.48.In men, Non Hodgkin lymphoma with annual incidence of 3.3 per 100000 have the highest portion (48.5%) and myeloid leukemia with annual incidence of 1 per 100000 have the lowest portion (13.2%) of these malignancies. In women Non Hodgkin lymphoma with annual incidence of 1.8 per 100000 have the highest portion (39.6%) and Hodgkin's disease with annual incidence of 0.8 per 100000 have the lowest portion (14.8%) of these malignancies (Figure 2).

City of Residence: Babol with SMR = 7.3 in average have the highest and Tone kabon with SMR = 1.4 in average have the lowest incidence rate annually.The highest incidence rate of these malignancies are in center of Mazandaran provinces and the lowest of that are in the west of Mazandaran provinces (Figure 3).

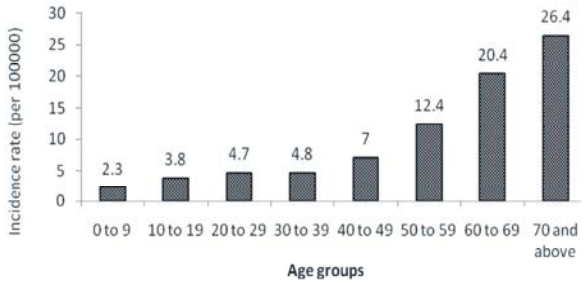

Fig. 1: Incidence rate of blood malignancies based on age groups in Mazandaran province

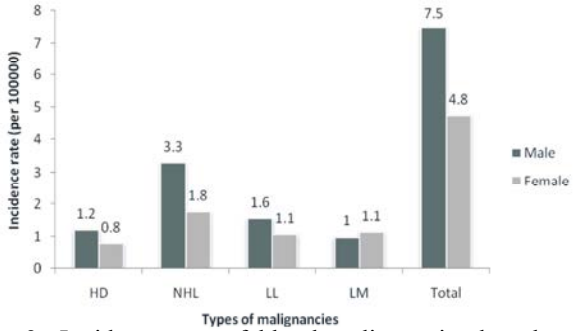

Fig. 2: Incidence rate of blood malignancies based on gender in Mazandaran province

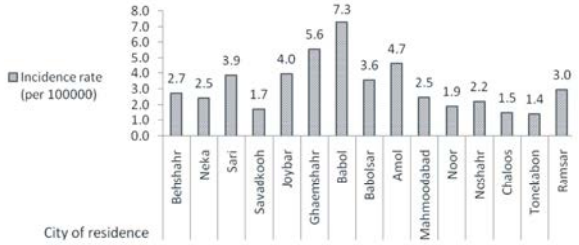

Fig. 3: Incidence rate (SMR) of blood malignancies based on city of residence in Mazandaran province

Type of Malignancy:

Hodgkin's Disease (HD): In the average have about 1 in 100000 incidence annually. The highest incidence rate was seen in the age group of 60 to 69 years (1.5) and the lowest incidence rate was seen in the age group of 0 to 9 years (0. 2). Incidence rate in the male was calculated 1.2 per 100000 and in the female 0.8 per 100000.male to female ratio is 1.5. The highest incidence rate was seen in Babol (SMR = 2) and the lowest incidence rate equally was seen in the both Neka and Tonekabon equally (SMR = 0.2).

Non Hodgkin Lymphoma (NHL): In the average have about 2.5 per 100000 incidence rate annually. The highest incidence rate was seen in the age group of 70 years and above (15.8) and the lowest incidence rate was seen in the age group of 0 to 9 years (0.3). Incidence rate in the male was calculated 3.3 per 100000 and in the female 0.8 per 100000.male to female ratio is 1.9. The highest incidence rate was seen in Babol (SMR = 1.8) and the lowest incidence rate was seen in Savadkooh (SMR = 0.3).

Lymphoid Leukemia: In the average have about 1.3 per 100000 incidence rate annually. The highest incidence rate was seen in the age group of 70 years and above (3.6) and the lowest incidence rate was seen in the age group of 40 to 49 years (0.8). Incidence rate in the male was calculated 1.6 per 100000 and in the female 1.1 per 100000.male to female ratio is 1.5. The highest incidence rate was seen in Babol (SMR = 1.6) and the lowest incidence rate was seen in Chaloos (SMR = 0.2).

Myeloid Leukemia: In the average have about 1.1 per 100000 incidence rate annually. The highest incidence rate was seen in the age group of 70 years and above (6.2) and the lowest incidence rate was seen in the age group of 0 to 9 years (0.1). Incidence rate in the male was calculated 1 per 100000 and in the female 1.1 per 100000.male to female ratio is 0.9. The highest incidence rate was seen in Ghaemshahr (SMR = 2.5) and the lowest incidence rate was seen in Mahmoodabad (SMR = 0).

DISCUSSION

Age Groups: Since the ages group of under10 years old have the lowest incidence rate (2.3 per 100000) and the ages group up to 70 years old have the highest incidence rate (26.4 per 100000), It shows that there are relationship between patient's age and morbidity of leukemia and lymphoma which this point were stated by researchers [2-4]. Synchronization of Increased incidence of Non-Hodgkin's lymphoma with increases age is shown higher than the rest of hematological malignancies. Lymphoid leukemia incidence is increased approximately in two periods, that one of it, is under 30 years old and other is above 50 years old and between the ages of 30 and 50 years, the incidence is relatively slow. Hodgkin's disease in the age 10 years and above has steady incidence rate. With increasing of age, the incidence of Myeloid Leukemia increases slowly while in the references were stated that Hodgkin's lymphoma is the most common malignancy among young adults 15 to 24 years [5] and the incidence of Hodgkin's disease has been relatively stable. Two periods of increased incidence is expressed, first around age 20 years and the other around age 80 years

[1,2,5]. It also stated that the incidence of Acute Myeloid Leukemia (AML) increases with age, so that 90 percent of this disease is seen around 40 years old and 10 percent in the children [2,4-6]. Until the middle of the fourth decade of life, the incidence of chronic Myeloid Leukemia (CML) increases with age gradually. The average age of onset of the disease is 53 years, then the incidence is accelerating [2,4]. Acute lymphoid leukemia (ALL) is often as children and young adult cancer so that 90 percent of the cases are seen in children and 10 percent of the cases are seen in adults [2,4,6]. Chronic Lymphoid Leukemia (CLL) is the most common form of leukemia in Western countries that more occur in adults and elderly and in the children is rare [2,4].

Gender: Overall incidence ratio of hematologic malignancies in the male to female is approximately 1.5 times. The difference in incidence rate between men and women, as stated in previous research, can show the possible impact of gender on the incidence of leukemia and lymphoma [2,5,7,8]. This difference could be due to sex hormones or differences in environmental exposures between the men and women while it has been reported that leukemia tend to involve men more than women [5,7,8]. Another report states that age adjusted incidence rate of Acute Myeloid Leukemia in the men is more than women (2.9 vs. 1.9) as well as age adjusted incidence rate of Chronic Myeloid Leukemia in the men is more than women (1.7 vs. 1) [2,4,8]. It also stated that age adjusted incidence rate of Chronic lymphoid leukemia, Hodgkin's disease and non-Hodgkin's lymphoma in the men is more than women [4,5,8] and in the last report of Mazandaran province stated that the overall incidence ratio of men to women in all types of leukemia and lymphoma is 1.5 [9,7].

City of Residence: Babol city with SMR = 7.3 has the highest incidence rate and Tonekaboon with SMR = 1.5 has the lowest incidence rate annually. Because the cities of the west province have better situation rather than to east provinces and the center of province have worst situation. As has been stated in various references it seems that residence and the geographical, economical, nutritional features and environmental exposures influence the difference in incidence rate [2,4-6], that among of them, probably physical and chemical exposures in the center of province are important.

Type of Malignancies: In this study, the total incidence rate of leukemia (Myeloid and Lymphoid) is obtained 2.4 per 100000 annually and incidence rate of lymphoma (HD & NHL) is obtained 3.5 per 100000, while the incidence rate of leukemia in the world have estimated 10 per 100000 [2,10]. Non-Hodgkin's Lymphoma has the highest annual incidence rate (2.5 per 100000) and Hodgkin's Disease has the lowest annual incidence rate (1 per 100000). The incidence rate of Acute Myeloid Leukemia is 2.3 per 100000 and The incidence rate of Chronic Myeloid Leukemia is 1 to 1.3 per 100000 [4,10] but in this study, the annually incidence rate of Myeloid leukemia (acute and chronic) is obtained 1.1 per 100000.

CONCLUSION

Given findings indicates clear differences of incidence rate based on age, sex, residence and type of malignancy. Therefore it's suggested that in addition to promote data collecting program, research projects should be programmed to define leukemia and lymphoma risk factors in this province. By making use of these results, as well as community education and implementing of some rules and regulations, reduce the risk of hematologic malignancies to reduce the burden of these diseases and years of life lost and ultimately improve the health of the community.

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