

Control and Prevention of Leukemia Cancer: A High Priority for Health Policy Makers

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Abstract

Leukemia is a metastatic and malignant disease for blood-making organs which is resulted due to incomplete evolution and problematic proliferation of white blood cells and its substrates in blood and bone marrow. Leukemia is responsible for 8% of total cancer cases and involves all age groups with different prevalence and incidence rate in Iran and whole the world and causes significant death toll and heavy expenses for diagnosis and treatment process.

Keywords: Blood-making organs; Blood disease; Myeloma; Incidence rate; Prevention report; Cancer records

Introduction

Although overall incidence is rare, leukaemia is the most common type of childhood cancer. It accounts for 30% of all cancers diagnosed in children younger than 15 years, but it is not limited to children and has higher incidence among adults with more complicated treatment process. Leukemia is classified to main four categories with different clinical symptoms: AML or acute myeloid leukaemia which mostly involves adults and consists about 30% of total adults' leukaemia cases, ALL or acute lymphatic leukaemia which is the most common type of disease among children and almost 80% of leukaemia cases among children is attributed to this type and finally, CML or chronic myeloid leukaemia which usually is seen among adults and CLL or chronic lymphatic leukaemia the most common type of leukaemia in adults which 90% of this type cases happens after 50 years old[1]. Also multiple myeloma or plasma cell myeloma is a malignant blood disease in which plasma cells involve by cancer. Multiple myeloma consists less than 1% of total cancer cases and less than 10% of total cancer cases and 10% of total blood malignancies and mostly involves old ones between 65-70 years old.

Methodology

Regarding increasing number of old age groups during past decades, multiple myeloma incidences have been increased. According to United state statistics, leukaemia incidence rate has been increased during 2002-2011. Also an incidence increase has been observed in a twenty years period in Netherlands among women between 50-64 years old and for Denmark between 1943-2003. In Iran, based on performed studies, blood malignancies have been surged during 1997-2003 for both sexes. Studies around the world show that blood malignancy incidence is increased by age [2]. Performed studies in Iran confirm increasing trend of blood cancer incidence by age increase so that age groups higher than 70 years old has the most incidence rate. Studies in Iran and other countries have shown that blood malignancies incidence is higher among men than women. Although the Etiology of Leukemia is unknown, but some environmental factors such as ionizing radiations, chemical materials such as benzene, pesticides, chemotherapy, smoking, genetic disorders, family history about CLL, infection with HTLV-1, financial and social level have been recognized as the risk factors for blood cancer as shown in (Figure 1). Some studies have confirmed changes in the Epidemiology and morphology trends of the cancers in some countries and Iran [3]. Considering different incidence rate around the world, so performed studies abroad the country cannot determine the cancer situation in Iran and also there

has not been yet any study about epidemiology, morphology and trend of this important disease during recent years in Iran and on the other hand, epidemiological studies are necessary for successful planning, therefore this study was done to evaluate epidemiology and morphology of blood cancer during 2003-2008. This is analytic cross-sectional study, carried out based on re-analysis national registry of cancer, and Disease Control and Prevention report of ministry of Health and Medical Education in Iran. Deputy for health of each university is responsible for health issues of the population and all health activities are managed by these deputies [4]. All deputies for health have been included in the NCR. Registrar would apply the national registration software which was developed by CDC. For pathologic centres, without software, the cancer records were gathered manually.

Discussion

The Cancer Office of CDC should provide techniques and funding supports. The data are transmitted every 3 months, by electronic file and also hard copy of Cancer Registry Data Collection Form'; this

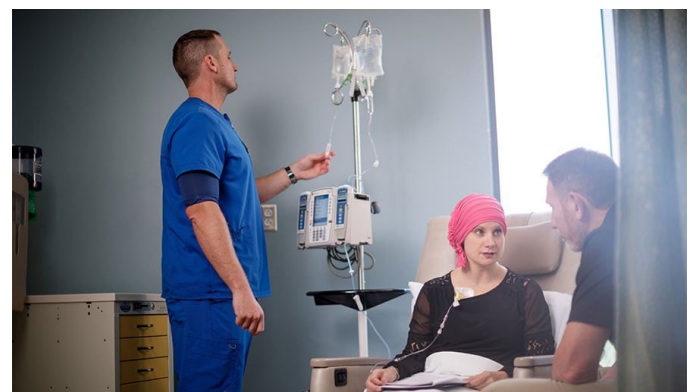


Figure 1: Chemotherapy for Leukemia.

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form is comprised of regarding patient's identity characteristics in addition to the name of biopsy-taker physician, name of hospital, location of which the biopsy is taken, clinical diagnosis and date of biopsy sent to histological laboratory and demographic information of the patients includes race and residence. Part II includes the most important findings of patient's clinical history [5]. The information includes primary location of tumour, date of cancer diagnosis, morphology and histology and its behaviour and diagnosis method. Physicians fill the form of clinical data and the official personnel fill the identity and demographic information. Quality control has been coordinated in five main areas by Cancer Office of CDC, Regarding completeness of coverage, completeness of details, accuracy of data, accuracy of reports, accuracy of interpretation and repeated cases are deleted from national data[6]. Surveillance of pathology is based on the cancer record in several selected provinces to compare it with the present pathology cancer record for a general and complete evaluation and also for the accuracy of the collected data [7]. IARC software provides a way to identify inaccuracies in data coding. Data were collected retrospectively reviewing all new hematopoietic and reticulo-endothelial systems cancer patients in Cancer Registry Centre report of health deputy for Iran during a 6-year period. Accordance of The International Classification of Diseases for Oncology Hematopoietic and reticulo-endothelial systems cancer was defined as ICD-O C42 [8]. This study investigated all cases of the morphology of Acute Myeloid Leukemia, Acute Lymphoblastic Leukaemia, NOS, Chronic Lymphocytic Leukemia and Multiple Myeloma as shown in (Figure 2). Statistical analysis, we calculated crude incidence rate and the Age-standardized incidence rate per 100,000 persons. We used direct standardized method using world standard population [9]. To describe incidence time trends, we carried out join point regression analysis using the software Join point Regression Program. As well to evaluate the morphological changes, were obtained the percentage allocated for kind of morphological types [10]. So to analysis morphology change percentage trends for six year, we carried out join point regression analysis using the software Join point Regression Program. The analysis included logarithmic transformation of the rates, maximum number of one join points, and minimum of six years between zero join points. All other program parameters were set to default values. The test of significance uses a Monte Carlo Permutation method [11]. Join point regression analysis involves fitting a series of joined straight lines on a log scale to the trends. The aim of the approach is to identify possible join points where a significant change in the trend occurs. In this study join point was a significant model. The final model selected was the most

parsimonious of these, with the estimated annual percentage change based on the trend within each segment. In describing trends, the terms significant increase or significant decrease signify that the slope of the trend was statistically significant [12]. All statistical tests were two sided. According to obtained results, blood cancer in Iran has an increasing trend. During a study which was done by Tahmasebi in Mazandaran province during 1996-2003, an increasing trend for 8 years period was observed, with non-Hutchkin lymphoma as the highest incidence rate and myeloma leukaemia has the lowest incidence rate. Farahmand et al. found during their study that standard incidence rate for blood cancer among children during a 8 years' time period i.e. 2000-2008 has been increased significantly for both sex groups and the highest incidence rate was related to ALL type[13]. Hejazi conducted a research in western Azerbaijan province in Iran for children less than 15 years old during 2003-2008 showed that acute blood cancer incidence has not a regular decreasing or increasing trend during studied years. In a study which was done by Rajabli from in Golestan province, standardized incidence rate for leukaemia among men and women were respectively 10.4 and 7.8, respectively [14]. Similar age standardized incidence rate for multiple myeloma among men and women were obtained equal to 2.1 and 2 which is higher than country and whole world. Based on last data released by United States, leukaemia incidence rate has been increased annually 0.2% from 2002 to 2011 and attributed death toll has been decreased on average 1% from 2001 to 2010. During a research which conducted in Korea from 1999-2008, blood cancer incidence has been raised from 10.2 to 13.7 and lymphatic myeloma and multiple myeloma were the most common types of malignant blood diseases. During a research which was done in Kazakhstan from 2003-2012, blood cancer incidence has been decreased from 4.3 to 3.2 and one study in Hong Kong showed a stable trend for blood cancer from 1990- 2008. Also performed study in Croatia showed a significant ALL stable trend for ALL incidence rate from 1988- 2009, meanwhile AML incidence has been decreased and CML incidence showed decrease for female but it has been stable among male group.

Conclusion

This study showed a stable incidence rate for ALL which is similar to England, USA and New Zealand. An increased incidence rate for CLL in Croatia is similar to Denmark and Netherlands.

Acknowledgement

None

Conflict of Interest

None

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Figure 2: Treatment of Leukemia.

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