Assessment of Some Environmental, Clinical and Laboratory Risk Factors in People with Leukemia under the Age of 20: A Systematic Review

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ABSTRACT

Introduction: Cancer is one of the major causes of death in the world and mortality rates are higher in developed countries. About one third of childhood cancers are blood cancer (Leukemia). Leukemia is high in children with high prevalence and mortality; still some of the risk factors are unknown. Therefore, this review study was conducted to determine some environmental, clinical and laboratory risk factors in people with leukemia under the age of 20.

Materials and Methods: The studies that were conducted in this research were written in English or Persian, Access to their full text was possible and published over the last 25 years, were included in the study and non-academic studies were deleted. The study was conducted in Persian and English by searching articles in the search engine, sites and databases scientifically Sid, Science direct, Google Scholar, Pub Med. In the first stage, 45 papers were found. Of these, 17 articles related to the subject, published in the last 25 years, were reviewed.

Results: According to the results of the studies, some variables and risk factors such as family history of cancer, the history of radiation exposure, the number of maternal pregnancies, the age of parents, the level of education of parents, the history of mother's use of mother's pill, smoking By the mother of a child during pregnancy, smoking by the child's father, the birthplace and residence of the child, and some other factors mentioned in result of this article, were observed in children with leukemia.

Conclusion: There were many environmental, clinical and laboratory factors in various studies that related to childhood leukemia. Also some of the characteristics of parents can be one of the factors affecting children with leukemia; Awareness of these issues can be effective in preventing this disease. It is advisable for the child to avoid these risk factors to prevent the risk of cancer.

Keywords: Leukemia, Cancer Children, Affected Child, Risk Factor, Environmental Factors

INTRODUCTION

Increasing the incidence of various types of cancer has addressed the researchers with several questions about the various causes of the disease (1). Cancer is the third leading cause of death in our country after heart disease and accidents (2).

The global burden of cancer is increasing due to aging and population growth as well as high-risk behaviors, especially smoking and environmental factors. Proper information on various cancers in specific geographical locations can help plan health services for the treatment and screening of high-risk groups (3). One of the causes of cancer is diabetes. Diabetes is the most common endocrine disorder (4). It is a metabolic disorder that reduces life (5-9). Complications of diabetes lead to an increase in mortality in people with diabetes. Low physical activity and the use of unhealthy foods have led to an uncontrolled increase in the prevalence of diabetes in the world (10-12). Patients with diabetes are more likely to develop cancer than the general population (13). Complications of diabetes are very common among patients. (4). among diabetic patients, depression is one of the most common psychiatric disorders (14).
Depression is one of the most common and debilitating problems for youth and adolescents. (15, 16). Depression and daily occupational stress may cause some disorders in people's intellectual, mental and physical health (17). The high occupational stress status is known as a known psychosocial factor in cardiovascular disease (18). Diabetes mellitus is one of the most common endocrine complications in thalassemic patients (20). Thalassemia syndrome is one of the hereditary blood diseases. In general, diabetes can have direct or indirect effects on many diseases. These complications are among them. (21-26).

Cancer is also the third leading cause of death for children ages 1 to 14 years old (27). Leukemia is the most common malignant neoplasm in childhood which accounts for 41% of malignancies in children under the age of 15 years and about 3,000 children and adolescents under the age of 19 are infected (28,29). Children with cancer also lose an average of 69.5 years of age (30).

The causes of leukemia are largely unknown (31). Considering that cancer is the second cause of death and the Diabetes Association cites the disease as a growing and costly cancer related and a major health concern (32). And that leukemia is high in children with high prevalence and mortality; still some of the risk factors are unknown. Therefore, this review study was conducted to determine some environmental, clinical and laboratory risk factors in people with leukemia under the age of 20.

MATERIALS AND METHODS
The studies studied were written in English or Persian. Access to their full text was possible and published over the last 25 years, were included in the study and non-academic studies were deleted. This study was conducted in Persian and English by searching articles in search engines, SID, Magiran, and Google Scholar, Embase, Research gate, Science direct, Google Scholar, Pub Med, Springer. In the first stage, 37 articles were found. Of these, 17 articles related to the subject, published in the last 25 years, were reviewed.

This study is a systematic review using the published articles in the last 25 years; it was about the risk of environmental, clinical and laboratory factors in people with leukemia under the age of 20 years. This review study was conducted based on the Broome method. The purpose of this method was to achieve the purpose of the study and to enhance the study's thorough understanding and comprehension. The method is based on three steps in the search of texts, data evaluation and data analysis. In the search phase of the texts, the studies after the retrieval were examined in terms of the criteria for entering the study in four stages. After obtaining the terms of entry into the study, the content of the study is evaluated and at the end the analysis of the data was done.

To achieve relevant studies, a wide range of key words were used which included leukemia, Cancer Children, Affected Child, Risk Factor and Environmental Factors, as a one-to-one search and combined with using the method "And" and "OR".

RESULTS
The results of various studies showed there was a significant relationship between the numbers of maternal pregnancies, the age of parents and the history of contraceptive use by mother with acute leukemia in children. The highest incidence of leukemia in the age group of 0-4 years was observed. The incidence rate in patients with blood groups A, O and Rh + was higher than other groups. The incidence of relapse in the age group of 5 to 10 years is 0.035 times the age group under 5 years. Children with Down syndrome also had leukemia.

Also, the age variable had a significant relationship with the relapse status of the patient (33-42). According to studies (33), the history of drug use during pregnancy, family history of cancer, a history of radiation exposure, and breast feeding were associated with the development of cancer. Finally, after multivariate testing, there were significant relationships between the two variables of drug use during pregnancy and family history of the disease.

According to some studies (35), there was a significant relationship between maternal pregnancy, parental age, parents' education and the history of contraceptive use by mother with acute leukemia in children. But finally, after performing a multivariate test, there was a significant relationship between mother's educational level, the history of contraceptive pills and the relationship between parents with acute leukemia in children.
In the study (36), significant risk factors associated with acute leukemia in children were: Father's occupation, smoking by mother of child during pregnancy, Tobacco use by the child's father Place of birth and residence, Contact Livestock, Father's Company in Chemical War, The number of family members more than 5 and the relative ratio between parents, Infection with viral diseases of chicken pox and mumps with acute leukemia, The inverse relationship was significant and was recognized as a protective factor. Also, in the study (37), the variables of contact with x-rays during fetal life, the presence of a smoker in the family, the history of using mother's contraceptive pill, Father's job contact with home-made chemicals and close to strong electrical power lines is one of the most important factors in the development of leukemia. Also, the most common clinical manifestations in the order of priority include lethargy and weakness, Fever, Foot pain, Cervical lymphadenopathy, Bleeding, pain in the abdomen and colds.

Also in studies such as third birthday and more children and the history of leukemia in close relatives significantly correlated with the risk of developing leukemia in the child. There was also a significant relationship between the birth weight of the child, History of keeping dogs or cats, Mother's age during pregnancy, number of brothers and sisters, there was no history of radiography in childhood and the risk of developing leukemia (33-50).

**DISCUSSION AND CONCLUSION**

Leukemia is high in children with high prevalence and mortality; still some of the risk factors are unknown. Therefore, this review study was conducted to determine some environmental, clinical and laboratory risk factors in people with leukemia under the age of 20.

The role of familial history of leukemia in children in the study is consistent with most of the other studies conducted. The findings of these studies indicate the potential role of genetic factors in the incidence of leukemia in children. In addition, it can indicate the association between environmental and infectious agents with leukemia. Because infectious and environmental factors are common between the child and relatives, especially the first-degree relatives.

The need for training and raising public awareness in order to avoid risk factors and screening in high risk individuals to improve prognosis. It seems that some of the characteristics of parents can be considered as an effective factor in the incidence of acute leukemia in children. Awareness of these issues can be effective in preventing this disease. Recurrence is higher in the age group of less than 5 years compared to the age group of 5 to 10 years, so this age group needs more attention and follow up. Some studies have shown that farmer being the father of a child, increasing the birth rate, keeping dogs or cats, the history of leukemia in close relatives is a risk factor for acute lymphoblastic leukemia. And blood leukemia seems to be caused by the interaction of genetic and environmental factors, like other malignancies.

The results of some studies, X-ray contact variables during fetal life, the presence of a smoker in the family, the history of using mother's contraceptive pill, Father's job contact with chemicals at home, up to high voltage power lines, the most important factors were the development of leukemia. Also, according to some studies, there was a statistically significant relationship between the number of maternal pregnancies, parent age, Parental education level and the history of contraceptive use was observed by a mother with acute leukemia in children, it seems that some of the characteristics of parents can be one of the effective factors in the development of children with acute leukemia Awareness of these issues can be effective in preventing this disease.

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