Clinical and Laboratory Finding in Children with Leukemia: a Systematic Review

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ABSTRACT

Introduction: *Cancer as a chronic disease after accidents and unintentional deaths is the third cause of mortality among children aged 1 to 14 years.Leukemia is strongly affected parents and their family due to high prevalence of childhood, high felony, high cost of treatment and long hospitalization. Therefore, this systematic review was conducted to assess Clinical and laboratory finding in children with leukemia.*

Materials and Methods: *This review study was carried out based on Broome method. The purpose of this method was to achieve the purpose of the study and to enhance the study's thoroughness and comprehension. The method is based on three steps in the search of texts, data evaluation and data analysis.The study was done by searching the search engines and scientific databases of articles include SID, researchgate, Sciencedirect, Google Scholar, Embase,elmnet, and PubMed in Persian and English.In the first stage, 37 articles were found. Of these, 23 articles related to the topic published in the last 30 years were reviewed.*

Results: *According to the results of the studies, the history of drug use during pregnancy, family history of cancer, a history of radiation exposure, and breastfeeding were associated with incidence the cancer. Also, there was a significant relationship between the number of maternal pregnancies, parental age, parents' education and the history of contraceptive use by mother with acute leukemia in children.*

Conclusion: *The results showed that some of the characteristics of parents can be one of the effective factors in the incidence of acute leukemia in children that 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.*

Keywords: *Leukemia, Cancer, Children, Children with Leukemia*

INTRODUCTION

Cancer is one of the major causes of death in the world and mortality rates are higher in developed countries (1). The incidence of cancer deaths is increasing, with at least about 8 million deaths per year due to cancer, according to World Health Organization statistics, the incidence of cancer deaths from 45% per year 2007 will reach 65% in 2030 (2).

The incidence pattern of different types of cancer varies among populations and is related to factors such as occupational, social, cultural, and racial, geographical and nutritional issues. In general, the incidence of certain cancers in some countries, such as Iran, China, Ireland and Chile, is increasing (3). One of the risk factors for cancer is diabetes. Diabetes is the most common endocrine disorder. (4) This disease is a chronic, metabolic and genetically

heterogeneous disease Which is characterized by an increase in blood glucose levels and a disorder of carbohydrate metabolism, protein and fatty acids (5-9). And it is also a major cause of death in the industrialized and developing world.Inappropriate combination (low physical activity and unhealthy foods) has increased uncontrolled diabetes prevalencein the world (10-12).Patients with diabetes are at higher risk for developing a variety of cancers than the general population (13).

Cancer as a chronic disease after accidents and unintentional deaths is the third cause of mortality among children aged 1 to 14 years (14).About a third of childhood cancers are leukemia. Leukemia is the most common malignant neoplasm in childhood, accounting for 41% of malignancies in children under the age of 15, and about 3,000 children and adolescents under the age of 19 years old Are

afflicted (15), (16). Children with cancer also lose an average of 69.5 years of age (17). The causes of leukemia, one of the most common malignancies in children, remain largely unknown (18).

So, given that studies such as Peterson et al. (19), Kavianpour et al. (20) examined the effects of chemotherapy on the executive functions of survivors of leukemia, the most reported difficulties are attention problems, memory, information processing speed and cognitive flexibility. Leukemia is strongly affected parents and their family due to high prevalence of childhood, high felony, high cost of treatment and long hospitalization. Therefore, this systematic review was conducted to assess Clinical and laboratory finding in children with leukemia.

MATERIALS AND METHODS

This study is a systematic review that using the articles published in the last 30 years in relation to the complications of chemotherapy in cancer patients was done. 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 thoroughness 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 keywords including leukemia, cancer, children, and children with leukemia have been used in "one-to-one", and the "AND and the OR" method. The studies studied were written in English or Persian, access to their full text was possible and published over the past 30 years, entered the study, and non-scientific studies were deleted. The study was done by searching the search engines and scientific databases of articles include SID, research gate, Science direct, Google Scholar, Embase, elmnet, and PubMed in persian and english. In the first stage, 37 articles were found. Of these, 23 articles related to the topic published in the last 30 years were reviewed.

RESULTS

The results of various studies showed that 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. Anti-E2 anti-HBV antigens were detected in up to 5% of patients with leukemia and 1.1% of healthy people.HGV viruses were detected in 2 to 5 percent of patients with leukemia. And the highest incidence of leukemia in the age group of 0-4 years was observed. The incidence of disease in subjects 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 0.35 times the age group under 5 years. Children with down syndrome were more likely to get leukemia. Also, the age variable has a significant relationship with the relapse status of the patient, so that the incidence of relapse in the age group of 5-10 years is 0.35 times the age group under 5 years. (21-30). Also, in some studies (21), the common symptoms of patients include bleeding, weakness and fatigue, respiratory symptoms, staining and fever. 90% of the patients had anemia and decreased platelet count. Leukocytosis and blast in peripheral blood were reported in 50% of cases. ESR increased in 90% of patients. Lymphanopathy was seen in 7.5% of cases and ESR increased in 90% of cases. According to studies (22), the history of drug use during pregnancy, family history of cancer, history of children with radiation, and breastfeeding were associated with the incidence of cancer.

Finally, after multivariate testing, there were significant relationships between two variables of history of drug use during pregnancy and family history of the disease. According to some studies (24), there was a significant relationship between the number of maternal pregnancies, the age of parents and parents, the level of education of parents and the history of contraceptive use by mother with acute leukemia in children. In the study (26), the significant risk factors associated with acute childhood leukemia were: father's occupation, smoking by the mother's mother during pregnancy, smoking by the child's father, the province of the place of birth and residence, contact with the animal, the father's company in the chemical warfare , The number of family members more than 5 and the relative ratio between parents, viral diseases of chickenpox and mumps with acute leukemia, had a significant negative correlation and were considered as protective factors.

Also in study (27), the variables include contact with x-rays during fetal life, the presence of a

smoker in the family, the history of contraception by the mother, the father's contact with chemicals and near home to the strong electrical power lines were among the most important factors in the incidence of leukemia. Also, the most common clinical manifestations were prioritization including palpitations and weakness, fever, foot pain, cervical lymphadenopathy, bleeding, abdominal pain, and cold fever.

Also in studies such as (18), (31-35), there were a significantly relationship between third and more births, retention of dogs or cats, and history of leukemia in close relatives and risk of leukemia and childhood cancer.

There was no statistically significant relationship between birth weight, mother's age during pregnancy, number of brothers and sisters, history of radiography in childhood and risk of leukemia.

DISCUSSION AND CONCLUSION

Cancer is one of the major causes of death in the world and mortality rates are higher in developed countries (1). Cancer as a chronic disease after accidents and abnormal deaths is the third leading cause of death in children between the ages of 1 and 14. (14) About one third of childhood cancers are leukemia (leukemia). Leukemia is the most common malignant neoplasm in childhood. Therefore, this systematic review was conducted to assess Clinical and laboratory finding in children with leukemia.

Diabetes also is a chronic disease and the most common disease caused by metabolic disorders. and is considered a global challenge (4), can be one of the causes of a variety of cancers-36) (45,but in this study, according to the studies, it has not been fully understood that diabetes affects or does not affect children's leukemia, and therefore further studies and further studies are needed.

The results of some studies (27), the variables of exposure to x-rays during fetal life, the presence of a smoker in the family, the history of contraception by the mother, the father's contact with chemicals and near home to the strong electrical lines were among the most important factors in the incidence of leukemia. The most common clinical manifestations of leukemia in some studies were weakness and lethargy, fever, cervical lymphadenopathy, bleeding, abdominal pain and cold, the main causes of these symptoms associated with anemia, reduced

white blood cell count and platelet count in circulation, abdominal cramps and lymph nodes. The onset of leukemia is usually intrusive and rapid. Clinical symptoms are usually non-specific and begin to appear as a disease. Specifically, parents will report that their child has been in good health.

Also, according to the results of some studies (24) that showed a statistically significant relationship between the number of maternal pregnancies, parents age, parents' education and the history of contraceptive use by mother with acute leukemia in children, it seems that some of the characteristics of parents can be one of the effective factors in the incidence of acute leukemia in children, and awareness of these issues can be effective in preventing this disease. The role of familial history of leukemia in children in the study (22) coincides with almost all other studies. The findings of these studies indicate the potential role of genetic factors in the incidence of childhood leukemia. In addition, it can indicate the association between environmental and infectious agents with leukemia, because infectious and environmental factors are common between children and relatives, especially the first-degree relatives. Education and increase public awareness in order to avoid the risk factors and screening in high risk patients is necessary to improve prognosis. It seems that some of the characteristics of parents can be an effective factor in the incidence of acute leukemia in children, and knowledge 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 a child's father, raising birth rates, keeping dogs or cats, and having a history of leukemia in close relatives are risk factors for acute lymphoblastic leukemia, and it seems that leukemia is similar to other malignancies in the effect of the interaction of genetic and environmental factors is caused.

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