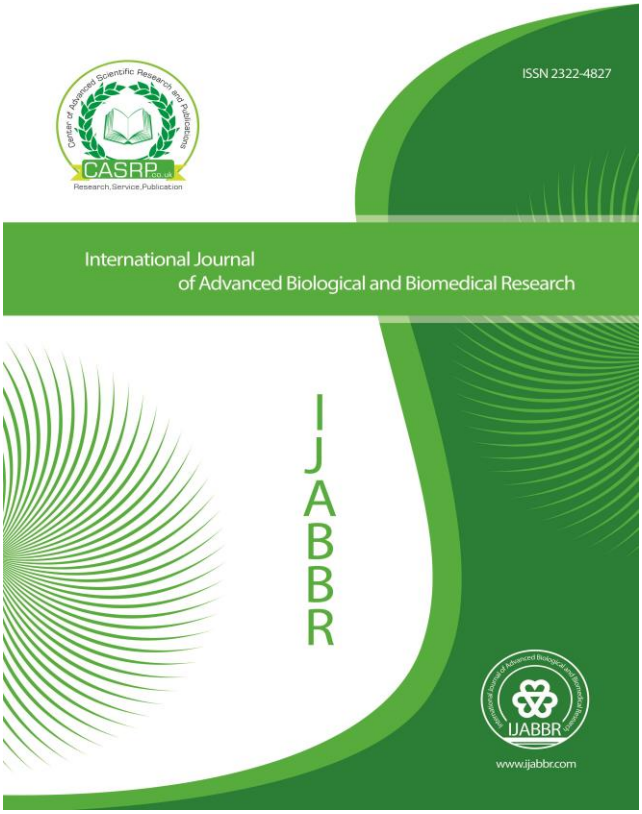

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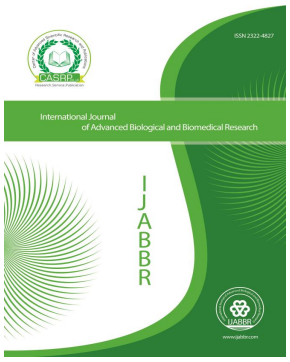

Original Article **Open Access**

Relationship between the human T- lymphotropic virus and myeloid leukemia, mycobacterium tuberculosis

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Abstract

Human T-cell lymphotropic virus type 1 , 2 (HTLV-1, 2) is endemic in Particular Areas of the world in which it is associated with myeloid leukemia.In this study, we described the prevalence of HTLV-1, 2 in myeloid leukemia and Mycobacterium Tuberculosis in Iran. We have worked with tissue and blood samples for 2 years. These were the same samples which were positive for myeloid leukemia, *Mycobacterium tuberculosis*,HTLV and were collected from Imam Khomeini hospital in Tehran, Iran. 100 cases were investigated (58% males, 42% females), the age of these samples were within 5 to 89 years old.In 65.7 percent of the leukemia rate HTLV-1 has been positive. Five cases (54%) were myeloid leukemia, 36.4% cases were not myeloid leukemia and 3 out of 8 cases (27.9%) unclassified lymphomas, were positive respectively. All 6 cases (100%) were adults with acute T-cell leukemia/lymphoma (ATLL) and *Mycobacterium tuberculosis* were positive. Among all cases, just one case has been positive for chronic myeloid leukemia and myeloproliferative disruption. Positive HTLV-1- show more in older ages than younger one. At younger ages offers less than negative items. According to our results, in Iran HTLV-1, 2

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is dramatically related to myeloid leukemia, and more studies are required for accurate connection with myeloma diseases and this area.

Keywords: HTLV-1, 2, Myeloid leukemia, Myeloma.

1. Introduction

Family of human T-lymphotropic viruses or human T-cell lymphotropic viruses (HTLV), are a group of human retroviruses that are known to cause a type of cancer, called adult T-cell leukemia/lymphoma and a demyelinating disease called HTLV-I associated myelopathy/tropical spastic paraparesis (HAM/TSP). The HTLVs belongs to a large group of primate T-lymphotropic viruses (PTLVs) (Manns et al., 1999). Members of this family that infect humans are called HTLVs, and the ones that infect Old World monkeys are called Simian T-lymphotropic viruses (STLVs) (Clark et al., 1985). Today, four types of HTLVs (human T-lymphotropic virus 1 [HTLV-I], human T-lymphotropic virus 2 [HTLV-II], HTLV-III, and HTLV-IV) and four types of STLVs (STLV-I, STLV-II, STLV-III, and STLV-V) have been identified. The HTLVs are believed to originate from intraspecies transmission of STLVs (Zhang et al.,1995). The original name of HIV, the virus that causes AIDS, was HTLV-III; this term is no longer in use (Bartman et al., 2008). The knowledge about HTLV-1 epidemiology is limited (Mori et al., 2002). The high prevalence was detected in Japan where more than 10% of the population are infected. The reasons for this extremely high prevalence has not been known. In some countries like Taiwan, Iran, and Fujian (a Chinese province near Taiwan), the prevalence is 0.1–1%. The infection rate is about 1% in Papua New Guinea, the Solomon Islands, and Vanuatu, where the genotype C is predominated (Einsiedel et al., 2011). Although it is present in some high-risk populations, including immigrants and intravenous drug users, in Europe HTLV-1 is still uncommon (Edlich et al., 2003). Among Americans, the virus is found in indiogenous populations and in descendants of African slaves from where it is thought to have originated (Beilke et al., 2003). The general prevalence is from 0.1 to 1%. In Africa the prevalence is not well known, but it is about 1% in some countries (Zeeb et al., 2004).

Acute myeloid leukemia (AML) is a type of blood cancer. AML usually develops from cells that would turn into white blood cells (other than lymphocytes) (Olière et al., 2001). Sometimes, though, it can develop from other types of blood-forming cells (Andrada-Serpa et al., 1989). Here is a basic information about the symptoms, risk factors, survival rates, and treatments for AML. Acute myeloid leukemia starts in the bone marrow, the soft inner parts of bones (Schuurman et al., 1989). With acute types of leukemia such as AML, bone marrow cells don't mature the way they're supposed to. These immature cells, often called blast cells, just keep building up (Garlet et al., 2010).Acute myeloid leukemias (AMLs) are infrequent yet,so virulent neoplasms are responsible for a large number of cancer-related death (Henry et al., 2007).

Mycobacterium tuberculosis is an obligate (Delacrétaz et al., 1987) pathogenic bacterial species in the family of Mycobacteriaceae and is the causative agent of most cases of tuberculosis (Tang et al., 2012). Tuberculosis is a most important global health problem, According to the report of WHO, “In 2012, an estimated 8.6 million people developed TB and 1.3 million died from the disease” (Tang et al., 2012; Sarvi et al., 2016).

At first, it is discovered in 1882 by Robert Koch. *M.tuberculosis* has an unusual, waxy coating on its cell surface (primarily due to presence of mycolic acid), which makes the cells impervious to Gram staining; M. tuberculosis can appear gram-negative and gram-positive in clinical settings (Laurian et al., 1986). So Ziehl-Neelsen stain, or acid-fast stain, is used instead (Stahl-Hennig et al., 2009). The physiology of *M. tuberculosis* is highly aerobic and requires high levels of oxygen. It is a primarily pathogen of the mammalian respiratory system which infects the lungs (Araújo et al., 2002). The most frequently diagnostic methods used for tuberculosis are tuberculin skin test, acid-fast stain, and chest radiography (Scoazecetal et al., 1988).

The relationships between retroviruses and hematologic cancer is better described in HTLV-1 and HIV infections. HTLV-1, 2 are the first human retroviruses discovered by Poiesz et al (Hayashi et al., 1990).There are case reports of HTLV-1 in non-AML myeloid malignancies (Altafulla et al., 1989). Myeloid malignancies and Tuberculosis can be seen in our hospital to HTLV-1. HTLV-1, is endemic in Iran, where there are prevalent of

unsigned blood donors and 33.15% chosen hospitalized patients, clinically suspicious to have 4.66% HTLV-1 related diseases,so we are going to study the prevalence of HTLV-1 in myeloid malignancies in Iran over 10 years.

2. Materials and methods

During the two years of blood samples from patients suspected myeloid leukemia Mycobacterium Tuberculosis bacteria collected from Tehran Imam Khomeini hospital. And also check records HTLV-1 and serology HIV tests by blood transfusion unit, and determine the hematologic malignancies and tuberculosis were examined at the same time.Diseases were examined by ELISA, and positive serum was tested by the Western blot method in a revered center. Myeloma was classified as myeloid leukemia. Immunophenotyping was not available.

3. Results and discussion

100 cases of histologically recorded hematologic malignancies and Tuberculosis (Table I) are composed of 58 males (59%) and 42 females (41%).The average range and sex distribution of any type was given in Table II. There was an age variability in positive HTLV-1.In this study the Myeloma and the acute form of AML make 63.7% of histologically recorded hematologic malignancies and myeloma is the most common hematologic malignancy in Iran. There was a significant relationship between positive HTLV-1, 2 and Myeloma here, from 76% of TB disease, 72.2% of TB, and all 6 cases of acute AML (63%) were positive HTLV-1. In Iran, the serum prevalence of HTLV-1, 2 in unsigned healthy blood donors is 57.2%. The positive HTLV-1, 2- items of TB may feature constitution of the Myelomatous kind of AML. In this study found an HTLV-1 spread of 86.1% in 88 cases of TB in Iran, an endemic HTLV-1 region.

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Table 1

The relationship between human lymphotropic virus and malignant diseases.

	Diseases	HTLV1	HTLV2	Age	Sex
1.	AML	25.23	14.12	25.12	74
2.	CML	47.12	35.1	47.23	84
3.	Myeloma	65.14	74	65.23	15
4.	hairy cell leukemia	35.2	58.23	85.12	25
5.	TB	56.2	32.25	35	65

Teble 2

Estimates the frequency of connections between the HTLV virus and malignant diseases.

Variable	Obs	Mean	Std. Dev.	Min	Max
AML	5	63.786	18.45407	36.12	85.12
CML	5	70.92	22.9826	35.12	95.12
Myeloma	5	76.444	20.58166	45.74	95.12
hairycell	5	58.296	29.34749	25.12	95.12
TB	5	72.924	23.75126	35.12	95.12

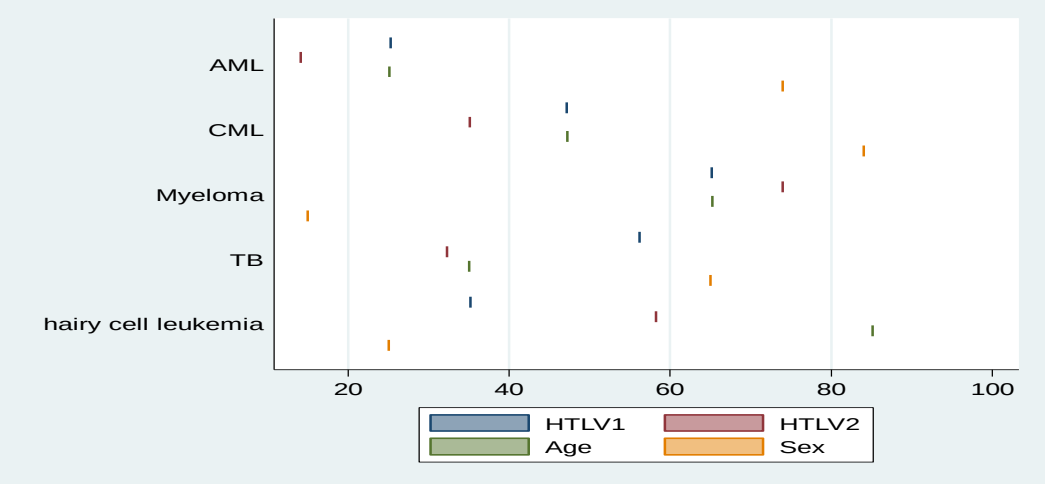

Fig. 1. Relationship between human T-lymphotropic virus and malignant diseases.

4. Conclusion

From the two seropositive chronic leukemias, one case is chronic lymphocytic leukemia and another is chronic myeloid leukemia. There is also a 65-year-old female with myeloproliferative disease. Mann et al. 1999 and Starkebaum et al. 1987, reported a case of HTLV-1 and B-cell chronic lymphocytic leukemia and a case of HTLV-1 and large granular lymphocyte leukemia respectively. We conclude that there is a relationship between HTLV-1 and Myeloid malignancies in Iran and this relationship is consistent with the findings of other studies; however, the association of Hodgkin disease that we see in these cases and its relationship with HTLV-1 needs other studies.

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