Screening For HTLV 1 & 2 Among Iraqi Patients With Lymphoma And Leukemia

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Abstract:

Background: A number of viruses are known to infect human lymphocytes and other blood components causing lymphoma and leukemia, among them are Human T-lymphotropic virus type 1 (HTLV-1) and Human T-lymphotropic virus type 2 (HTLV-2).

Objective: Find out the prevalence of HTLV 1&2 infections in Iraqi patients with lymphoma and leukemia and the association of this infection and the malignancy with other factors related to the patient himself or the surrounding environment he is living in.

Methods: The study was conducted in The National Center of Hematology in Al-Mustansiriya University for the period from July 2008 to May 2009. The sample consisted of a total 250 patients with lymphoma and leukemia, 120 males and 130 females, their mean age was (40.76±14.58) years and age range (13-79) years, they were from all over the Iraqi governorates. All patients were interviewed directly by similar questionnaire, measurements (height and weigh) and a sample of blood was taken from every patient and tested for the presence of the virus using ELISA technique.

Results: The study showed positive results for HTLV infection in 3 patients which is about (1.2%) of the sample

Conclusion: HTLV 1&2 infection is present in Iraqi patients complaining of lymphoma and leukemia with a prevalence of 1.2%.This is the first report in Iraq regarding HTLV 1&2 positivity among leukemia and lymphoma patients, the prevalence was lower than other countries, All factors and characteristics of patients were consistent with other studies regarding lymphoma and leukemia.

Keywords: *HTLV, Lymphoma, Leukemia*

Introduction:

A number of viruses are known to infect human lymphocytes and other blood components causing lymphoma and leukemia, among them are Human T-lymphotropic virus type 1 (HTLV-1) and Human T-lymphotropic virus type 2 (HTLV-2). The 2 viruses belong to the Retroviruses family, Retroviruses are a large and diverse family of enveloped, single-strand RNA viruses characterized by the unique replicative strategy that includes reverse transcription of the virion RNA into linear double-stranded DNA and the subsequent integration of this DNA into the genome of the cells.[(1)]

It has been estimated that 20 million persons worldwide are infected with HTLV-I, including 1.2 million in Japan. Other endemic areas are the Caribbean, parts of the south-eastern states of the USA, Melanesia and parts of sub-Saharan Africa, especially west and central Africa. Recently, HTLV-I infection has been found to be relatively common in southern Africa, particularly Natal. Northern Iran is another recently described area of HTLV-I infection with cases described in neighboring Middle East and central Asian countries. HTLV-II infection is found among native American Indians in North, Central and South America and was until recently considered a New World virus.[(2)]

Objective:

Find out the prevalence of HTLV 1&2 infections in Iraqi patients with lymphoma and leukemia and the association of this infection and the malignancy with other factors related to the patient himself or the surrounding environment he is living in.

Patients and Methods:

The study was conducted in The National Center of Hematology in Al-Mustansiriya University for the period from July 2008 to May 2009.

The study sample consisted of a total 250 patients with lymphoma and leukemia, 120 males and 130 females, their mean age was (40.76±14.58) years and age range (13-79) years, they were from all over the Iraqi governorates. A preliminary pilot study was done on a small group of patients (20 patients) in the same place.

All patients were interviewed directly by similar questionnaire, measurements (height and weight) and a sample of blood was taken from every patient and tested for the presence of HTLV 1&2 infection using ELISA technique.

Analysis of data was carried out using SPSS 11.5 (Statistical Packages for Social Sciences, version 11.5).

Enzyme immunoassay for detection of antibodies to HTLV I & II:

Wantai HTLV I & II, Double Antigen (Sandwich) ELISA Kit was used to detect the presence of antibodies against the virus. This kit is an enzyme-linked immunosorbent assay (ELISA) for qualitative determination of antibodies to HTLV I & II in human serum or plasma.

It is intended for use in screening of blood donors and for aid of the diagnosis of clinical conditions related to infection with HTLV I and / or HTLV II.

Results:

Results showed that Elisa test was positive only in 3 patients which is about (1.2%) of the sample, all 3 patients were females, all from southern governorates, all were leukemia cases (2 CML, 1 AML) as shown in table (1) and (2).

The commonest malignancy in the study sample was CML (76%) followed by Non-Hodgkin Lymphoma (7.2%) and ALL (6.4%) as shown in table (2).

There was positive family history of malignancy in (12.4%) of cases, the most frequent malignancy type was blood malignancy (29%) followed by GIT, bladder and uterine carcinoma (9.7%) as shown in table (3).

The association between blood malignancy, smoking, alcohol intake, tea intake and exposure to explosions are shown in table (4).

Table 1 : The frequency distribution of cases with blood malignancy by their result of HTLV ELISA.

ELISA	No	%
HTLV positive	3	1.2
HTLV negative	247	98.8
Total	250	100

Table 2 : The frequency distribution of cases of blood malignancy by their type of malignancy.

Type of malignancy	No	%	HTLV +
Leukemia - CML	190	76.0	2
Leukemia - AML	9	3.6	1
Leukemia - CLL	12	4.8	-
Leukemia - ALL	16	6.4	-
Hodgkin Lymphoma	2	0.8	-
Non-Hodgkin Lymphoma	18	7.2	-
Hairy cell Leukemia	3	1.2	-
Total	250	100	3

Table 3 : The frequency of malignancy in families of blood malignancy patients and its type.

Family history of malignancy		No	%
Yes		31	12.4
No		219	87.6
Total		250	100
Type of malignancy	Blood malignancy	9	29.0
	GIT malignancy	3	9.7
	Bladder malignancy	3	9.7
	Lung malignancy	2	6.5
	Liver malignancy	1	3.2
	Bone malignancy	2	6.5
	Uterine malignancy	3	9.7
	Prostate malignancy	1	3.2
	Other malignancies	7	22.6
Total		31	100

Table 4 : The association between blood malignancy, smoking, alcohol intake, tea intake and exposure to explosions.

		No	%	χ^2 , P-value
Smoking habits	Yes	56	22.4	152.352
	No	194	77.6	0
	Total	250	100	
Alcohol intake	Yes	6	2.4	453.152
	No	244	97.6	0
	Total	250	100	
Tea intake	Yes	239	95.6	415.872
	No	11	4.4	0
	Total	250	100	
Exposure to explosions	Yes	73	29.2	86.528
	No	177	70.8	0
	Total	250	100	

Discussion:

HTLV 1&2 infection is present in Iraqi patients complaining of lymphoma and leukemia with a prevalence of 1.2%.

A similar study conducted in India revealed a strong disease association of HTLV infection with hematological malignancies, High prevalence of anti-HTLV antibody was identified in the patients with hematological malignancies (8 of 86 patients, 9.3%) three of 22 (13.6%) patients with leukemia, 3 of 11 (27.3%) with cutaneous T-cell lymphoma (CTCL) and 2 of 53 (3.8%) with lymphoma were reactive for anti-HTLV antibody.[3]

Another study in Dominica, HTLV was seropositive in 38.6% (31/80) of all hematologic malignancies. Three of 6 cases of Hodgkin disease (50%), 16 of 36 (44.4%) of non-Hodgkin lymphoma, and 3 out of 8 unclassified lymphomas (37.5%) were seropositive; all 6 cases (100%) of acute adult T-cell leukemia / lymphoma (ATLL) were seropositive.[4]

A seroprevalence study for human T lymphotropic virus type-1 (HTLV-1) and HTLV-2 was conducted in Sao Paulo, Brazil among 2312 individuals; Antibodies to HTLV-1/2 were screened by enzyme-linked immunosorbent assay (ELISA) and confirmed by Western blot and / or radioimmunoprecipitation. It confirmed the presence of HTLV-1 in two cases or 3.5% of all hematological malignancies. In addition, it also demonstrated the presence of HTLV-2 (4.7%), and HTLV-1/2 (0.8%) in tribes of Amazonian Indians who lived in the eastern Amazon basin (southeastern State of Para).[5]

So the prevalence of HTLV infection in Iraqi patients with lymphoma and leukemia is lower than other countries which may be due to social factors and related to the ways of transmission of the virus which are less common in our community such as drug abuse and extramarital relations. This is the first report in Iraq regarding HTLV 1 & 2 positivity among leukemia and lymphoma patients. This result may be comparable with Sao Paulo study. Also this study is lower than Sao Paulo study, but still Iraqi population differ from Brazilian population in habits, cultural and social relations.

The commonest malignancy in the study group was CML (76%) followed by Non-Hodgkin Lymphoma (7.2%) and ALL (6.4%).

In a similar study in Pakistan the commonest malignancy was AML (35.39%) followed by ALL (19.15%) and Non-Hodgkin Lymphoma (15.39%) while CML was only (10.76%).[6] CML constitute more than three fourth of the cases in the study, while in Pakistan study it represented only 10%, The difference may be probably due to different cultural, social & environmental factors.

Cases with smoking history represent (22.4%) of all case, it was statistically not significant. A retrospective study was conducted in Italy to investigate the possible association between smoking and the risk of hematological malignancies. A small, but not significant, increase in malignancy was observed in smokers. Significant association was demonstrated between smoking and acute nonlymphoblastic leukaemia, and myelodysplastic syndromes. The duration and amount smoked increased the risk;

heavy smokers presented significant positive associations with overall malignancies, whereas light smokers did not present any significant association.[7]

Cases with history of alcohol intake represent (2.4%) of all case, it was statistically not significant. A study conducted in Oakland (USA) showed that alcohol drinking is associated with slightly lower risk of hematological malignancy, due largely to inverse relations to lymphocytic and myelocytic leukemia.[8]

Cases with history of tea intake represent (95.6%) of all case, it was statistically not significant. A cohort Study in Japan evaluated the association between green tea consumption and the risk of hematologic malignancies, it showed that green tea consumption was associated with a lower risk of such malignancies.[9]

Cases with history of exposure to explosions represent (29.2%) of all case, it was statistically not significant. A study analyzed the recorded cases of registered malignant diseases among children under 15 years of age in Basrah for the period (1990-1997) trying to find out the effect of depleted uranium on people health. This analysis showed a rise of 60% in children's leukemia from 1990 to 1997. Also a 120% increase in all malignant cases among children under the age of 15 for the same period was registered. The study also showed the shift of age distribution of leukemia cases towards younger than 5 years of age from 13% in 1990 to 41% of total cases in 1997.[10]

Conclusion:

HTLV 1&2 is present in Iraqi patients complaining of lymphoma and leukemia with a prevalence of 1.2%. This is the first report in Iraq regarding HTLV 1&2 positivity among leukemia and lymphoma patients, the prevalence was lower than other countries, All factors and characteristics of patients were consistent with other studies regarding lymphoma and leukemia.

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