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Full Length Research Paper

Seroprevalence of human T-cell lymphotropic virus type 1 infection (HTLV1) in different patients in the north of Iran

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Human T-cell lymphotropic virus type-1 (HTLV1) is a lymphotropic virus which can contribute to carcinogenesis in adult T-cell leukemia, myelopathy and other disorders. 20 million people are affected by this virus in the world. The aim of this study was to determine the incidence of human T-cell lymphotropic virus type 1 infection in patients referred to Emam's hospital laboratory in Sari. A cross-sectional study was done in 2009 to 2010 based on the different patients that were referred to Emam's hospital laboratory in Sari. Our samples were selected by simple random selection, after venous blood sample was centrifuged and reserved in -70°C. All the samples were tested by enzyme-linked immunosorbent assay (ELISA). An ELISA positive result was checked by Western blot (WB) assays. Out of 1200 cases, 776 were female (65%) with ages between 1 and 76 years old. Most of the cases were Mazandaranian (99%); although only one person was recorded as HTLV1 positive (0.08%). He was a 41 years old man, living in Sari, with high school education. He was married (one wife) without any risk factor in past medical history, such as surgery, transfusion and abuse of injection, but he had HBV infection. Most of the females were housewives and most of the males were non-governmental employees; moreover, diabetes was more common among them. The results of the samples show that 122 women were pregnant, 92 cases had transfusion and 642 cases had different surgery. It was observed that the incidence of HTLV1 infection was very rare in the north of Iran (Sari); therefore, the routine HTLV1 screening was not recommended.

Key words: Seroprevalence, human T-cell lymphotropic virus type-1 (HTLV1), patients, Iran.

INTRODUCTION

Human T-cell lymphotropic virus type-1 (HTLV1) is a retrovirus which predominantly infects the T-cell (Hollberg and Hafler, 1993) and has been recognized as the etiologic agent of a mature T-cell leukemia/lymphoma (ATL) and a chronic myelopathy known as HTLV1 – associated myelopathy (HAM) / tropical spastic paraparesis (TSP). Also, it is the cause of uveitis, chronic arthropathy, Hashimoto thyroiditis and pulmonary alveolitis (Osame et al., 1986; Gessain et al., 1985). HTLV1 infection can be transmitted through unprotected

sex, from mother to infant (in the course of breast feeding and transplacental), contaminated needles and blood transfusion (Monplaisir et al., 1993; Murphy et al., 1989). HTLV1 infection is endemic in certain geographical areas, including Japan, the Caribbean islands, Parts of Africa and Brazil (Yamaguchi, 1994; Cesarie et al., 1999; Shindo et al., 2002). In Iran, the first case of ATL was reported in 1986 and subsequently Mashhad has been recognized as an endemic area for HTLV1 infection (Farid et al., 1995).

Patients with different etiology such as: malignancy, major thalassemia, hemodialysis, Gastro-intestinal (GI) disorders (hepatitis) and diabetes are at high risk of contacting HTLV1 infection due to their need for repeated

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Table 1. Age distribution and blood transfusion of HTLV1 study in different patients in Sari, Iran (2009-2010).

Age (year)	Gender		Total number (%)
	Female number (%)	Male number (%)	
1-10	11 (1)	17 (1)	28 (2)
11-20	33 (3)	27 (2)	60 (5)
21-30	166 (14)	68 (6)	234 (60)
31-40	156 (13)	68 (6)	224 (19)
41-50	146 (12)	55 (4)	201 (16)
51-60	147 (12)	57 (5)	204 (17)
≥61	117 (10)	132 (11)	249 (21)
Total	776 (65)	424 (35)	1200 (100)
Blood transfusion	39 (3)	53 (5)	92 (8)

blood transfusion or needles (Taghavi and Fatemi, 2009). Therefore, this study was conducted to determine seroprevalence of HTLV1 infection in different patients from the central province of Mazandaran (Sari) in the north of Iran.

MATERIALS AND METHODS

A total of 1200 samples from different patients, such as different malignancies, diabetes mellitus, hepatitis and pregnancy were tested for HTLV1 specific antibodies from March 2009 to March 2010. Serum samples were screened for HTLV1 specific anti body using ELISA (ELISA, Diapro, Italy). All of the ELISA positive samples were confirmed by western blotting analysis (WBI HTLV1 blot 204 kit: gene lab diagnostic, Ltd).

A questionnaire including questions about demographic status, type of disease, transfusion, needles and surgery was fitted by the medial student. The data were analyzed using descriptive test and SPSS soft ware (Chicago. Lt. Version 12).

RESULTS

Out of the 1200 patients that were tested for HTLV1 specific antibody, the percentage of females was 65% (770) (Table 1).

The history of transfusion was 92 cases (7/7%). Of these patients with transfusion, females were 39 cases while males were 53 cases. Small and large surgery was 642 cases (53/5%) with one time surgery in 572 cases. In the female group, GI and urology surgery were more common and 122 persons were pregnant, while in the male group, urology, GI and orthopedic surgery were more common. More patients lived in Mazandaran province (1187, 99%), but more of the cases (934) become common, the more they move to Sari city (78%). The patients with other cases lived in other cities of Mazandaran province (Table 2), although few patients lived outside Mazandaran province (7, 1%). More

patients (65%) had primary or high school education (under-diploma) (Table 3). Also, it was observed that more patients had only one partner, while 14 cases were found with two partners (1/2%).

Basically, 340 cases were referred to the laboratory to fill the outpatient form (28/3%) (Table 4), but only one patient (41 years old) (0.08%) was found with hepatitis B infection, which supposedly resulted from HTLV1, without any history of surgery, transfusion or suspected needle. He had an under-Diploma education and was found with one partner.

DISCUSSION

In this study, we showed the results of the presence of HTLV1 infection among different disorders in the north of Iran (Mazandaran province). We evaluated different disorders including neurologic (such as multiple sclerosis, paralysis and tumor), gastrointestinal disorders (ulcer, inflammatory bowel diseases and tumors), hematology and oncology disorders (chronic anemia and malignancies), urologic disorders (renal stone, malignancies and urinary tract infection), obstetric and gynecology disorders (pregnancy and malignancies) and other disorders, such as diabetes mellitus, thyroid diseases, pneumonitis, dermatitis and polymyositis.

This study showed very low prevalence of HTLV1 infection in different disorders (0.08%). This is compatible with some other geographic low endemic areas, where the seroprevalence of HTLV1 is generally low (Payne et al., 2004), but this infection is endemic in certain parts of Iran including Mashhad (Razavi province), in the East north of Iran (Farid et al., 1995; Mirsadraee et al., 2007). This result was lesser than that shown in major thalassemic patients in Sari where five cases of positive form 288 (1/7%) was recorded (Unpublished by the author).

The prevalence of HTLV1 infection was 5/6 times higher in the type 2 diabetic population than the blood

Table 2. The distribution of life locations of our patients.

Location	Gender		Total number (%)
	Female number (%)	Male number (%)	
Sari	639 (53)	298 (24/5)	934 (77/5)
Neka	41 (3)	30 (2/5)	71 (5/5)
Behshar	23 (2)	12 (1)	35 (3)
Ghaemshar	33 (3)	36 (3)	69 (6)
Savadkoh	1 (0/1)	6 (0/5)	7 (0/6)
Joibar	16 (1/5)	10 (1)	26 (2/5)
Amol	6 (0/5)	5 (0/5)	11 (1)
Chaloos	2 (0/2)	1 (0/1)	3 (0/3)
Nooshahr	1 (0/1)	3 (0/2)	4 (0/3)
Mahmodabad	3 (0/2)	2 (0/2)	5 (0/4)
Tonekabon	2 (0/2)	2 (0/2)	4 (0/3)
Noor	1 (0/1)	3 (0/2)	4 (0/3)
Kiasar	4 (0/3)	4 (0/3)	8 (0/6)
Babolsae	3 (0/2)	3 (0/2)	6 (0/4)
Lahijan	1 (0/1)	-----	1 (0/1)
Gorgan	2 (0/2)	3 (0/2)	5 (0/4)
Semnan	1 (0/1)	2 (0/2)	3 (0/3)
Tehran	2 (0/2)	2 (0/2)	4 (0/3)
Total	776 (65)	424 (35)	1200 (100)

Lahijan, Gorgan, Semnan and Tehran are cities outside Mazandaran province.

Table 3. The education levels of different patients with HTLV1 in Sari, Iran (2009-2010).

Level	Gender		Total number (%)
	Female number (%)	Male number (%)	
Primary and high school	710 (59)	394 (32.5)	1004 (91.5)
University	95 (5)	26 (2)	85 (7)
Illiterate	9 (1)	4 (0/5)	15 (1/5)
Total	776 (65)	414 (35)	1200 (100)

donor group (Hjelle et al., 1990). Also, this infection was higher in neurological conditions such as T cell leukemia/lymphoma (ATLL), HAM/TSP, acute disseminated encephalomyelitis (ADEM), amyotrophic lateral sclerosis syndrome (ALS), myopathy, neuropathies and multiple sclerosis (MS) (Gastaldello et al., 2004; Iwasaki, 1990; Dalakas, 2006; Barkhaus and Morgan, 1988), but in our study, there were no positive cases in these groups. In other studies, HTLV1 infection and esophageal squamous cell carcinoma did not appear to have any significant correlation (Oger, 2007). In another study, concerning the prevalence of HTLV1, there was no statistical difference among the three groups including the representative population, neurological and non-neurological patients (1/2, 1/8 and 1/6%), in the Lome teaching hospital (Togo) respectively.

However, this was compatible with our study, but spastic paraparesis was the only disease that was significantly linked to HTLV1 (15/5%) (18). HTLV1 seroprevalence was 4/4% (75, 1727) in pregnancy cases (Carles, 2004), but all of the pregnant patients were negative. Therefore, this region is not an endemic area for this virus and perhaps this is the best explanation for it from a lower seroprevalence of HTLV1 among the high risk patients in this region.

Based on our results, the prevalence of the virus is lower than that in some other regions in Iran and other countries (Farid et al., 1995; Balogou et al., 2000). Conclusively, all evidence suggests that this virus is not endemic in this region of Iran (Sari, Mazandaran province); thus, there is no need for an HTLV1 screening test.

Table 4. Distribution of different disorders in different patients with HTLV1 in Sari, Iran (2009 to2010).

Disorder	Gender		
	Female number (%)	Male number (%)	Total number (%)
Diabetes mellitus	205 (17)	78 (6/5)	283 23/5
Orthopedic	42 (3/5)	45 (4)	87 (7/5)
Hepatitis	10 (0/8)	18 (1/5)	28 (2/5)
Hematologic	38 (3)	15 (1/25)	53 (4/5)
ENT	2 (0/16)	4 (0/58)	9 (0/81)
Malignancies	38 (3)	77 (5/8)	115 (9)
Obstetric	143 (11/9)	-----	143 (12)
Urologic	70 (5/8)	82 (6/8)	152 (12/5)
Gastrointestinal	87 (7)	35 (2/9)	122 (10)
Neurologic	45 (4)	38 (3)	83 (7)
Endocrinology	35 (2/9)	13 (1)	48 (4)
Dermatology	10 (0/8)	6 (0/5)	16 (1/5)
Respiratory	30 (2/5)	6 (0/5)	36 (3)
Cardiac	21 (1/75)	4 (0/3)	25 (2)
Total	776 (65)	424 (35)	1200 (100)

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