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Prevalence of HTLV-1 Antibody among Major Thalassemic Patients in Gorgan (South East of Caspian Sea)

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Abstract: In this study, the prevalence of HTLV-1 infection among the thalassemic patients was investigated. 181 thalassemic patients whom referred to Talghani hospital during, Oct. 2004-Sep. 2005 were participated in this study. HTLV antibody was determined using ELISA technique. In this procedure (Diapron laboratory kit) HTLV, positive samples tested by HTLV-1 western blot (kit, 2.4) to confirm, ELISA positive samples and also to detect the HTLV types. From 181 thalassemic patients, 93 (51.4%) were males. The age rate of these ranged 1-25 years, (mean of 14.11 ± 6.5). Of these subjects 169 patients (93.4%) were received packed cell at least one unite per month. 28(14.9%) of subjects were HTLV positive, while only 4.4% of them were confirmed by western blot and also for contamination with type-1 virus infection. Contamination with this virus increased, as the patients were getting older. The findings derived from this study indicated that among the thalassemic patients in Gorgan there were cases with HTLV-1, infection that was correlated with the other part of the country. It is therefore concluded; that further comprehensive studies are required to identify infected blood donations by blood donors in Gorgan.

Key words: HTLV-1 antibody, thalassemic patients, ELISA, Western blot, Gorgan

INTRODUCTION

HTLV-1 infects T-cells and it easily can be transmitted through blood and blood products such as whole Blood, packed cell and platelets; while there is not any report of infection for the patients whom receive plasma (Tavanai Sani, 2001). 2/3 of people receiving contaminated blood acquire the infection and the virus keeps itself permanent in the infected subjects. In human this virus infects T-cells and subsequently this cells become proliferated and specific immunity against HTLV-1 is stimulated. Following this event, the immune system destroys T-lymphocytes, which express the surface viral antigens. Those T-lymphocytes that do not express the antigens, remain alive, proliferate and may cause leukemia. These viruses are distributed all over the world (South of Japan, Caribbean region, South of United of States, some parts of Africa).

Nowadays, this virus is known as an etiologic factor for ALT and chronic degenerative neurologic called as TSP (tropical spastic paralysis) diseases (Farid and Shirdel, 1999). Some studies showed that HTLV-1 is endemic in Mashhad and in the South of Khorasan in the East of Iran (Tavanai Sani, 2001; Farid and Shirdel, 1999).

The endemicity of HTLV-1 depends on various factors such as environmental, social, behavioral and health factors (Farid and Shirdel, 1999). In endemic areas and in regions where HTLV-1 is epidemic, seroconversion is seen in 44-63% cases after receiving HTLV-1 infected blood derivatives.

According to the study in Khorasan province, one fifth of infected subjects are those people whom received blood more than once. It is suggested that all of blood donors have to be examined for the HTLV-1 in order, to prevent the transmission of this virus to other people after the performance of proper serologic tests (Tavanai Sani, 2001). It should be mentioned that there is not any specific antiviral drug to cure the diseases. So the only way is the preventative measure, such as dismantling the HTLV-1 positive blood component.

The frequency of this virus among the families, with infected members is high. As it was mentioned before blood is one of the main ways for the virus transmission.

Thalassemic patients that receive repeated blood transfusions are considered high-risk targets in regard to HTLV-1 infection. The region where this present study was carried out was Golestan province neighboring the North Khorasan, which is an endemic area for this virus.

There are also some reports about the presence of this virus in Golestan province and as for as this virus increases the cancer risk and ALT, this study was set up to investigate the prevalence of HTLV-1 infection, among the thalassemia major patient in Gorgan.

MATERIALS AND METHODS

In this descriptive cross-sectional study, blood was taken from 181 thalassemic patients referred to Talghani hospital for receiving the periodical blood transfusion during, Oct. 2004-Sep. 2005. The serum samples from the patient's blood was separated and kept frozen at -20°C . At the time of blood sampling, a questionnaire was filled for every patient containing the demographic and the required variable for this study. Enzyme Linked Immunosorbant Assay (ELISA) technique was used to investigate the presence of HTLV-1 antibody against the virus. The positive test for HTLV-1 antibody, subsequently were followed up for further positive test confirmation and virus typing using the Western-Blot method (HTLV Blot 2.4. Genelab Diagnostic's Ltd.). The true positive tests and identified virus types were recorded. SPSS software was used to analyze the data, using statistical tests such as Chi-square test.

RESULTS

From 181 thalassemic patients whom referred to Talghani hospital in Gorgan, 93 patients (51.4%) and 88 patients (48.6%) were male and female respectively. The age of these subjects were between 1-25 years with mean age of 14.11 ± 6.5 . 28 subjects live in the families of 6-9 people and 153 live in families of 2-5 people. The mean of family member was 4.23 ± 1.44 . From the 181 patients, 169 subjects (93.4%) received packed cell only once a month. 86 patients had parents who had familial relation. The history of blood diseases was present among 36 (19.9%) patients' families.

ELISA test showed that out of 181 thalassemic patients 28 subjects (14.9%), were HTLV antibody positive, but the western Blot (as a confirmatory test for ELISA) confirmed only 8 true HTLV-1 positive cases (4.4%).

The prevalence of HTLV-1 by Western Blot tests according to the various ages are gathered in (Table 1), but the highest infection rate was shown among the age group of 21-25 years. The rate of infection caused by this virus in patients receiving packed cell components either once or twice a month was 4.1 and 8.3%, respectively.

Table 1: Frequency of HTLV-1 Antibody with Western blot test in age groups of thalassemic patients in Gorgan

Variables	Western blot		
	Positive No. (%)	Negative No. (%)	Total No. (%)
Age groups			
1-5	-	15 (100.0)	15 (8.3)
6-10	1 (2.9)	34 (97.1)	35 (19.3)
11-15	2 (4.3)	44 (95.7)	46 (26.4)
16-20	3 (4.8)	60 (95.2)	63 (34.8)
21-25	2 (9.1)	20 (90.9)	22 (12.2)
Total No. (%)	8 (4.4)	173 (95.6)	181 (100.0)

DISCUSSION

The findings from this study showed that, 4.7% of the thalassemic patients had HTLV-1 antibody using western Blot technique. These results are in partial agreement with other studies carried out both in Iran and other parts of the world (Italy) 4.8% (Agliaño *et al.*, 1998), Shiraz (Iran), 3.12% (Sotoodeh and Tabei, 1994), Shiraz (Iran) 3% (Arjmandi, 2001), Hormozgan (Iran) 3.7% (Pour Karim *et al.*, 2004). Findings of present study did not correlate with other studies that was carried out on thalassemic patients (New York 6.12% (Jason *et al.*, 1985), Cecil 6.5% (de Montalembert *et al.*, 1993), Vietnam 9.1% (Lin *et al.*, 1997), Italy 2.7% (Mozzi *et al.*, 1992), Shiraz (Iran) 25.5% (Ghaderi and Agahi, 1996), Isfahan (Iran) 2.7% (Moaiedi *et al.*, 2000), Sistan and Bluchestan (Iran) 1.6% (Moradi *et al.*, 2002). Despite of different data reports in studied regions, it seems that there may be areas with higher prevalence rate of HTLV-1 in Iran than expected. Differences existing in the virus prevalence reports could be due to specific geographical regions, different laboratory technique for the identification of the antibody against virus, (mostly reported by ELISA method which should be confirmed by Western Blot). The importance of Western Blot as a confirmatory test has been obvious regarding to studies performed in Hormozgan (South of Iran) which ELISA test indicated 41 HTLV-1 antibody positive cases but Western Blot confirmed only 14 cases, or to present study which ELISA test was positive for 28 cases, but Western Blot confirmed only 8 cases with antibody against HTLV-1. Finally it should be mentioned that various studies on non-thalassemic patients in various regions could show different data (Ajami *et al.*, 2000), but it should be stated that all of the above studies were carried out on thalassemic patients. It can be concluded that, the presence of HTLV-1 contamination in thalassemic patients that are repeatedly receiving blood and blood products is an indication that, the HTLV-1 infection among the blood donors is existed. A study in Thailand showed that there was not any HTLV-1 infection among the thalassemic patients, because the blood donors did not have the

HTLV-1 infection (Chiewsilp *et al.*, 1993). Present study showed that there between the thalassemic patients' gender in Gorgan and HTLV-1 infection, was not any statistical significant. In this study, the lowest and highest rates of infection were seen among the patients of 0-5 years and 21-25 years old with 0 and 9.1%, respectively. The reason for high rate of infection in 21-25 age group may due to continues usage of blood or blood products in comparison with 0-5 years of age group. There were not any statistical correlation between infection with HTLV-1 and parents familial relationship, the history blood disease within the family, thalassemic patient in the family and the number of people in one family, but the endemicity of HTLV-1 depends on the environmental, social, behavioral and hygienic factors (Farid and Shirdel, 1999). There is not any specific antiviral treatment of the infection. The only preventative measure is to identify and dismantling the infected blood derivatives that are seropositive for the HTLV-1. Blood is one of the main sources of the virus transmission, among people receiving blood, or blood products. Thalassemic patients, that require repeated blood transfusions are high-risk individuals for HTLV-1 infection. In conclusion, the results of this investigation showed that the HTLV-1 infection is not only confined to the endemic area, but the only way of virus transmission is not only blood products. In developing countries such as Iran, the principal way of transmission is through blood and blood products, therefore of is necessary, that all of the blood donors populations, should be investigated for HTLV-1 as a preventative measure to stop keeping transmission of this virus to others people and thalassemic patients. Blood or blood products are remained the main risk factors for the transmission of this virus through blood transfusion, because there is not a blood screening procedure for the HTLV-1 in this region, therefore it is suggested that similar studies are required to have to a clear picture of the HTLV-1 infection within the Golestan province.

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