Survey of Toxoplasma Contamination in Kidney Recipient Patients by Elisa Method and Comparison it with Control Group in Tabriz (East-azerbaijan), Iran

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ABSTRACT

Toxoplasma is a common zoonotic infection between human and animal in the world. In the congenital form pathogenic agent is transmitting to the fetus through the maternal placenta. Acquired infection is due to ingestion of the oocysts, which are exacted by cats or transmitted through the contaminated meat. Congenital infection can lead to fetal death, pathological changes of CNS or the eye disease. The acquired form of the disease often is no sign, or is characterizes by general lethargy, swallow of lymphatic nodes and chorioretinitis. In the compromised patient or the patient with malignancy or tissue plants, lethal and acute infections take place. The aim of this study was the investigation of prevalence of antibody of anti Toxoplasma gondii in the serum of kidney recipient patients referred to the Tabriz kidney and Imam Hospitals. In this cross-sectional survey, a number of 96 blood sample of the kidney recipient and a number of 96 blood sample of the control patients were collected and were tested(IgG and IgM) by the ELISA method. Results showed that total prevalence of Anti Toxoplasma IgG in kidney recipient was 36.46%. The high infection rate was between age group of 41-50(60%) and the least rate was seen in the age group of 31-40(16%). Also in control group the same condition was considered. So, according to the high positive cases among the implantic patients, there should be some regular screen programs to recognize the chronic infection which are going to the acute. The measurement of the seral titration of these patients should be done and undergone the antiparasitic treatment.

Key words: Kidney Recipient patients, Toxoplasma, ELISA, Tabriz, Iran.

Introduction

Toxoplasmosis is a worldwide infectious disease caused by the protozoan Toxoplasma gondii. Disseminated life-threatening infection is more common in immunocompromised individuals, such as patients with human immunodeficiency virus infection or transplant recipients [5]. Human infection is acquired mainly by ingestion of undercooked infected meat containing Toxoplasma cysts or by ingestion of oocysts from faecally contaminated foods or via poor hand hygiene. In immunocompetent individuals, acute infection is usually self-limited and rarely symptomatic, although some cases of severe infection due to unusual Toxoplasma genotypes have been reported in South and Central America [6]. The acute phase of infection is followed by a latent chronic phase that is characterized by the life-long persistence of cysts in tissues. The containment of cysts by specific immunity is a determining factor for this latency, as it has been shown experimentally that depleting cellular immunity or cytokine mediators of macrophage activation results in the reactivation of chronic toxoplasmosis [13].
humans, the relationship between immunosuppression and occurrence of severe toxoplasmosis is well recognized. In human immunodeficiency virus (HIV)-infected patients, the incidence of toxoplasmic encephalitis is closely related to the progression of immunodeficiency and a decrease in CD4 counts [17, 20], whereas restoration of immunity following highly active antiretroviral therapy markedly decreases this incidence [2]. This relationship supports the rationale for preventing toxoplasmosis in HIV-infected patients via specific prophylaxis in patients with CD counts <100 /mm3 and by initiating highly active antiretroviral therapy to restore cellular immunity [15,26]. In non-AIDS immunocompromised patients, the risk of severe toxoplasmosis is also well recognized. In an extensive review of the literature, Israelki and Remington [14] identified 212 cases between 1953 and 1993, highlighting the high frequency of life-threatening toxoplasmosis in organ transplant patients. Since then, the practice of solid organ and bone marrow transplantation has markedly progressed, and the conditions of transplantation, as well as measures undertaken for prevention of infection, have improved. The aim of present survey is to determine the serum titration of this parasites anti body in Kidney Recipient patients in Tabriz (center of East-Azerbaijan province) by ELISA method for distinguishing the contamination to Toxoplasmosis.

Material and Method

This was a cross-sectional study, which was conducted at the laboratory of serology of protozoa, veterinary faculty of Islamic Azad University Tabriz branch, from Mar 2010 to Sep 2010. In this survey persons divided to two groups, one group consists of kidney recipient patients and other group as a control group. Kidney recipient patients were obtained from patients referred to the Imam Hospital in Tabriz, also for control group, patients with attention to sex, age, geographic state and living method like to subgroup (in fact from healthy persons) were collected. The blood samples from 96 kidney recipient parents and 96 control parents were collected. Blood sampling was performed without anticoagulant according to standard techniques and after 30 min, the tubes were centrifuged at 2,000 rpm for 5 min and then sera were aliquoted in several labeled vials and kept frozen at -20°C. For determination of anti-T. gondii antibodies, all sera were tested by Enzyme-Linked Immunosorbent Assay (ELISA) kits. For determination of anti-T. gondii IgG and IgM antibodies of ELISA kits purchased from the Biotech Trinity Captia TM Company (American) were used. The optical density of IgG antibody titers were read at 490 nm using automatic ELISA reader (SPECTRA, Molecular Devices, USA). Sera with 17/4 IU/mL or above were considered positive for T. gondii immunoglobulin G antibodies. In this study also two parameter consist of age and sex for determine of seral titration of Anti body in various ages (10-20, 21-30, 31-40, 41-50, 51-60, 61-70 and >70) and for male and female, were used. Data were analyzed using SPSS (version12) software. Significance of difference was analyzed by chi-squared and Fisher’s exact tests. Odds ratio was calculated when whenever it needed. P<0.05 was considered significant.

Results and discussion

The results of this survey shows, from 96 patients of control group 2 cases were found to be seropositive, and with attention to age for this group 1 person (50%) in >70 old group and 1 person (3.13%) in 10-20 old group were observed. In control group for other old groups infected cases to toxoplasmosis were not observed. Table 1 shows the negative and positive cases infected to toxoplasmosis of control group in Tabriz. Also according to sex for control group, from two infected cases, 1 of male (1.82%) and female (2.43%) infected to toxoplasmosis were observed. From negative cases of control group 54 patients was belong to male (98.18%) and 40 patients was belong to female (97.57%) were determined. Also significant gender different between female and male in control group was not characterized.

In kidney recipient group, 35 cases (36.46%) from 96 cases infected to toxoplasmosis by ELISA method were distinguished. Table 2 shows the negative and positive infected patients of kidney recipient group in different old year group. According to age, seropositive cases were highest in 41-50 year old group with on average of 60% and lowest in 31-40 year old group with an average of 16%.

61 cases of kidney recipient patients by ELISA method negative were distinguished and maximum of these cases in 31-40 year old group and minimum of these cases in 41-50 year old were observed. According to sex for kidney recipient patients 22 persons of male (42.3%) and 13 of female (29.54%) infected to toxoplasmosis were observed. In this survey a relationship between seral titration of IgG and increase of the age of infected patients to toxoplasmosis were observed which there was significant different (p<0.05). Also by attention to maximum infected patient belongs to males no significant gender different in seroprevalence was found between male and female. The results of this survey, belong to both control and kidney recipient groups shows which positive case in all year old groups and gender group were not observed, therefore in figure were not demonstrated.
Table 1: N and P cases of control group in Tabriz, Iran.

<table>
<thead>
<tr>
<th>Old group</th>
<th>Negative</th>
<th>Positive</th>
<th>Total</th>
</tr>
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<tbody>
<tr>
<td>10-20</td>
<td>31</td>
<td>1</td>
<td>32</td>
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<tr>
<td>21-30</td>
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<td>31-40</td>
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<td>51-60</td>
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<td>61-70</td>
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<td>&gt;70</td>
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Table 2: N and P cases of kidney recipient group in Tabriz, Iran.

<table>
<thead>
<tr>
<th>Old group</th>
<th>Negative</th>
<th>Positive</th>
<th>Total</th>
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<tbody>
<tr>
<td>10-20</td>
<td>10</td>
<td>10</td>
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<td>21-30</td>
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<tr>
<td>&gt;70</td>
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Discussion:

Toxoplasmosis is an opportunistic protozoan parasite infection, widespread in humans and animals and emerges as a life-threatening risk in immunocompromised individuals [18]. Seroepidemiological survey in different parts of the world indicates that the prevalence rates range from zero to 98% [8]. In this study serral titration of Anti-T.gondii IgG antibody in control and kidney recipient patients of Imam Hospital by ELISA method respectively 3.13% and 36.46% were determined. In one study by Sukthana and et al. in Thailand (2000) rate of specific Anti-T.gondii IgG and IgM Antibodies in healthy persons respectively 3.2% and 0% were reported which is conforms with present study [25]. Results of this study showed which serral titration of IgG with increase of age is increased in kidney recipient patients. This subject can be for previous infection and contact with new Anti-Toxoplasma Antibodies. In fact with increase the age for the time of encounter is increased and contamination rate will have been increased. Of course in this study for donor patients significant serral titration of IgG were not observed and this can be for healthy of these persons, which from healthy aspect by one specialist Doctor had been examined. This subject is conforms to studies by Sedaghat and et al. (1978) and Solljoo and et al. (2010), which in this studies increase in serral titration of IgG with increase of age were observed [22,24]. In accordance with sex differences, the prevalence was found to be higher in some studies in females [1,9] and sometimes in males [7], however, consistent with some studies [4,10,23], but in this study significant sex difference between the seropositive persons were not observed. Toxoplasmosis has very importance and in most cases of recipient patients has been reported, which this subject shows the rule of this disease inrecipient patients [3,19,21]. In Iran, the seroprevalence rate is about 51.8% [5]; the highest infection rates have been reported from North provinces including Mazandaran and Guilan with a temperate and humid conditions, but in South of Iran where the climate is dry and cold, infection rate is low [11]. It appears that the three factors mentioned above are there in this area. Therefore by attention to these objects can say dry and cold weather in Tabriz cases lower infestation rate in this region [12].

Conclusion:

In conclusion, kidney recipient patients should be tested for Toxoplasma gondii regularly. Clinicians should be more alert with these patients and parasitological surveys of them should be periodically carried out to prevent the risk of severe toxoplasmosis.

Reference


