

Seroepidemiological study of toxoplasmosis in intellectual disability children in rehabilitation centers of northern Iran

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Received 18 February 2006; received in revised form 25 February 2006; accepted 6 March 2006

Abstract

Serological studies revealed that toxoplasmosis has world wide distribution. Although the infection by *Toxoplasma gondii* is widely prevalent in humans and animals, the disease is uncommon and most of the acquired infections are asymptomatic. The important aspect of this parasitic infection is the probable danger of congenital transmission and its severe effects on the fetus. There have been many reports about the prevalence of anti-*T. gondii* antibody among different groups of people in Iran; however the epidemiological data in intellectual disability (ID) persons are rare. This study was performed to evaluate the seroprevalence of toxoplasmosis among the inhabitants of rehabilitation centers of northern Iran. A total of 336 serum samples (161 males, 175 females) were examined for the IgG antibodies by indirect immunofluorescence technique. First of all, 1:50 titer dilution was tested, in the cases of positive result, further dilutions (1:100, 1:200, 1:400, 1:800, 1:1600, and 1:3200) were prepared and the last dilution was recorded. Among 336 sera, 77.4% showed seropositivity by IFAT. The positive rates of males and females were 77.6% (125/161) and 80% (140/175), respectively. However, there were no significant differences between sexes. Comparing the age groups, the highest seropositive rate showed in 19 or higher, and their rates had a tendency to increase with age. Prevalence of the infection in 10 rehabilitation centers was not significant either. Nevertheless, our data (77.4%) in rehabilitation centers in northern Iran suggest that infection is the same as in many other reports in normal population in this area, therefore toxoplasmosis is not a major problem in rehabilitation centers of this geographical area.

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Keywords: Seroepidemiology; *Toxoplasma gondii*; Intellectual disability (ID); Rehabilitation center; Immunofluorescence

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1. Introduction

Toxoplasma gondii (*T. gondii*), an obligate intracellular parasite found in many species throughout the world, causes a variety of clinical syndromes in human and animals (Young-Ha, Hung-Jun, Ok-Sun, Sang-Keol, & Dae-Whan, 2000). It is generally accepted that prevalences of antibody in human populations depends on geographic, climatic, hygienic, and socioeconomic conditions, as well as on the life style of the population. All of these factors are considered to be related to the opportunity for an individual to accidentally ingest either of two forms (oocyst or cyst) of the toxoplasma organism (Remington, Mcleod, & Desmonts, 1995). The frequency of toxoplasmosis acquisition during pregnancy ranges from 1 to 4 per 1000 pregnancies in several countries, and congenital infection has a prevalence of 0.2–2 per 1000 births (Williams, Macfarlane, Williams, Eliasjones, & Williams, 1981). According to Wong and Remington (1994), 90% of infected cases are asymptomatic or oligosymptomatic. Toxoplasmosis during pregnancy can cause congenital infection and manifest as mental retardation, blindness and low IQ in the infant (Sever & Ellenberg, 1988). The severity of fetal disease varies with the gestational age at which maternal infection occurs (Tenter, Heckerroth, & Weiss, 2000). The aim of the present study was to determine the prevalence of toxoplasmosis in intellectual disability (ID) children in rehabilitation centers of northern Iran.

2. Methods and materials

This descriptive study was conducted from September 2004 to March 2005 in ID children and adolescents in 10 rehabilitation centers of Mazandaran province of northern Iran. Mazandaran province is located on the south coast of the Caspian Sea. The temperature in this province usually varies between 20 and 35 °C in summer and rarely drops to zero in winter. The annual rainfall is about 800–1200 mm and the relative humidity varies between 70 and 100%. The samples size was calculated as 336 individuals on a prevalence of 50%, $d = 0.05$ at a confidence level of 95%. The age of the survey subjects ranged from 5 to 19 years, and were grouped at 5-year increments, except for those from subjects over 19, which were grouped in one age group. The age and gender characteristics of the subjected population are shown in Table 1. Blood samples were collected. After centrifugation, sera were used for this study. Serum samples were analyzed for antibodies to *T. gondii* by the indirect immunofluorescence antibody using commercial toxoplasma antigen (Rayyan teb). Dako, anti-human serum conjugate with fluorescein isothiocyanate was used at a dilution of 1:50 in phosphate buffered saline with 0.1% Evans blue. Each serum sample was first examined at dilution of 1:50, if this dilution gave a positive result; further dilutions (1:100, 1:200, 1:400, 1:800, 1:1600, and 1:3200) were made in

Table 1
Age and gender compositions of the present survey population

Age (years)	Number of individuals		Total
	Male	Female	
<5	3	1	4
5–9	20	26	46
10–14	52	71	123
15–19	56	51	107
≥20	30	23	53

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