

## Toxoplasma antibodies in immigrants from Hong Kong

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### SUMMARY

The sera of 200 Chinese adults recently immigrated to Canada from Hong Kong were examined for antibodies to *Toxoplasma gondii* by the indirect fluorescent antibody technique. It was found that the total incidence was 18·0%. This is significantly lower than that of the indigenous population of the same age groups in this area.

### INTRODUCTION

Toxoplasmosis is prevalent throughout the world. The prevalence as shown by serological tests is more widespread in the warm climates (Feldman, 1968). A previous report suggested that sera from Hong Kong had a low incidence of positivity according to the Sabin-Feldman dye test (Ludlam, Wong & Field, 1969). The purpose of this communication is to report on the incidence of toxoplasmosis in 200 Chinese recently immigrated to Canada from Hong Kong. The incidence of toxoplasmosis in the general population in this area (Montreal, Quebec, Canada) had previously been determined (Seah, 1973).

### MATERIALS AND METHODS

The existence of the Montreal Chinese Hospital, the only hospital for Chinese in Canada, made this study possible. Recent immigrants to this City who presented themselves to this hospital's outpatient clinics for various reasons were asked to submit blood samples. In this survey 200 sera were collected from persons over 20 years of age, all of whom had been in Canada for less than 2 years. All had come from Hong Kong and about half were born there. The rest had spent a number of years in Hong Kong. None of them had symptoms or signs suggestive of toxoplasmosis when seen in the outpatient clinics.

The serological method used was the indirect fluorescent antibody test (IFAT). This method was based on the methods of Kelen, Ayllon-Leidl & Labzoffsky (1962), Fletcher (1965), and the one used in the Center for Disease Control, Atlanta, Georgia, U.S.A. (1970). The antigen was prepared in this laboratory from peritoneal exudate of mice that had been inoculated intraperitoneally with trophozoites of the RH strain of *Toxoplasma gondii* 3 days previously. For the purpose of initial screening, serum dilutions of 1/16 and 1/64 were used.

After appropriate incubation with the unknown serum samples, washing in

Table 1. *Prevalence of positive indirect fluorescent antibody test for toxoplasmosis by age and sex in Chinese immigrants*

Age group	Male			Female			Total		
	No. tested	No. positive	% positive	No. tested	No. positive	% positive	No. tested	No. positive	% positive
20-30	18	2	11.1	20	3	15.0	38	5	13.2
31-40	27	4	14.8	23	6	26.1	50	10	20.0
41-50	21	4	19.0	29	6	20.7	50	10	20.0
51-60	9	2	22.2	21	3	14.3	30	5	16.7
Over 60	8	2	25.0	24	4	16.7	32	6	18.8
Total	83	14	16.9	117	22	18.8	200	36	18.0
	(634)*	(172)	(27.1)	(564)	(147)	(26.1)	(1198)	(319)	(26.6)

\* The figures in parentheses indicate the prevalence of positive indirect fluorescent antibody test for toxoplasmosis in the general population of the same age groups.

phosphate buffer, incubation with conjugated antihuman globulin, and further washing, the slides were covered with buffered glycerol and cover-slips. The slides were examined with the high dry objective in a Leitz Ortholux fluorescent microscope equipped with BG 12 exciter filter, OG 1 barrier filter and super pressure vapour lamp Osram HBO 200. The reaction was considered positive when greenish yellow fluorescence was seen around the periphery of the *Toxoplasma* trophozoites. A titre of 1/16 was considered positive, and any positives were repeated and diluted to titres.

This indirect fluorescent antibody test for toxoplasmosis had previously been shown to be as sensitive, reproducible, and approximately the same in terms of absolute titres as the long established Sabin-Feldman dye test (Walton, Benchoff & Brooks, 1966).

## RESULTS

A total of 200 sera from individuals over 20 years of age was tested. There were 83 men and 117 women in this survey. Table 1 shows the prevalence of positive IFAT for toxoplasmosis by age and sex in these Chinese immigrants. In the male the incidence seems to increase with age, and the total positivity is 16.9%. In the female the peak incidence is found to be in the 31-40 years group, and the total incidence is 18.8%. There is no significant difference in the incidence between the male and female. The results of an earlier survey of the general population in Montreal are included in the same table in parentheses (Seah, 1973). It is also seen that while the total positivity of the general population in Montreal is 26.6% for the age groups indicated, that of the Chinese immigrants is 18.0%.

## DISCUSSION

The prevalence of toxoplasma antibodies varies in various parts of the world (Feldman, 1968). In Britain in a survey of blood donors the incidence was found to increase with age. The incidence reported was 21%, 30% and 40% for 21-30,

31–40 and 41–50 age groups respectively (Fleck, 1969). The prevalence in North America is between 20 and 30% (Feldman, 1968). In Montreal it has been determined that the overall rate of positivity by the indirect fluorescent antibody test is 23.7%, with much lower rate in the paediatric age group, and a peak incidence of 28.4% in the 31–40 years age group (Seah, 1973).

There is very little information on the incidence of toxoplasmosis in Southern Chinese. A literature search revealed no such survey. Ludlam *et al.* (1969) performed the dye test on sera from Hong Kong. There were no positives in 32 adult Hong Kong women; 2 out of 35 sera from men were positive and 5 out of 46 meat workers were positive. This is a very small survey, but it yielded a total positivity of 6.2%. This is very low incidence indeed, especially for a tropical area. The tropical areas are generally believed to have a higher prevalence of toxoplasmic antibodies (Wright, 1957; Roever-Bonnet, 1972). Asians coming to the United Kingdom from East Africa and the Indian subcontinent appear to have the same prevalence of toxoplasmic antibodies as the indigenous population (Dodge, 1972).

Zaman & Goh (1969) reported on the results of 754 sera from Singapore residents using the haemagglutination test. Their results showed that 21.8% of the Chinese, 39.1% of the Malays and 36.6% of the Indians were positive. These sera were from clinically suspected cases of toxoplasmosis or infectious mononucleosis and therefore cannot be considered as representative of the general Singapore population.

The present survey shows that immigrants from Hong Kong have a lower prevalence of toxoplasmic antibodies than the indigenous population of Canada. The exact reason is not clear. Chinese are known to like their meat well cooked. As infected meat is an important source of infection this may account for the relatively lower incidence. In this survey the history of keeping cats as pets was not gone into. In the crowded conditions in Hong Kong very few Chinese keep cats as pets.

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