



ABSTRACTS OF RECENT CHINESE PUBLICATIONS ON PROTOZOAN INFECTIONS<sup>1</sup> (I)

1. Guo, Z. Z. et al. Application of the enzyme-linked immunosorbent assay in the diagnosis of amoebiasis. National Medical Journal of China, 1984, 64(2): 71 (In Chinese, with English abstract)

Sera from persons with amoebiasis, from normal individuals and from persons with diseases other than amoebiasis were examined by the enzyme-linked immunosorbent assay (ELISA). The antigen used was prepared from axenic culture of Entamoeba histolytica HKg. All of the sera from 24 patients with amoebic liver abscess and 17 patients with amoebic dysentery showed positive reactions, the titres being much higher in the former group (1:5120-1:81920) than in the latter group (mostly 1:640-1:20480). Of the 14 sera from asymptomatic carriers, 3 showed positive reactions, indicating that tissue invasion only occurred in a minority of the carriers. All of the control sera from 107 healthy individuals gave negative reactions. Sera from 57 patients with parasitic diseases other than amoebiasis and from 40 patients with other gastrointestinal diseases were also examined. Of these 97 serum samples, 3 showed mild positive reactions with a titre of 1:320, and all became negative when the sera were diluted to 1:640. It seems unlikely that this minority of probably false positives would interfere with the diagnosis of amoebiasis, particularly that of amoebic liver abscess.

ELISA was found to be more efficient in assessing the prevalence rate of amoebiasis than faecal examination. In 261 cases examined by both methods simultaneously, the rate found by ELISA was 9.6%, while that found by faecal examination was only 3.1%.

2. Miao, H. Z. et al. Amoebic pericarditis: a report of 5 cases. Chinese Journal of Infectious Diseases, 1983, 1(4): 235 (In Chinese)

Between 1961 and 1982 amoebic pericarditis was encountered in 5 men aged 24 to 45 years. The main manifestations were liver abscess and cardiac tamponade. In 3 of the patients, pericarditis was caused by perforation of the liver abscess in the left lobe; the other 2 patients gave chocolate-coloured pus on aspiration of the left lobe abscess. Of these 5 patients, 2 succumbed to the disease due to failure of early recognition and timely institution of pericardiocentesis. Sudden development of chest tightness, dyspnoea, palpitations and sharp drop of the blood pressure were strongly suggestive of perforation of amoebic liver abscess into the pericardium. An electrocardiogram, ultrasonography, chest X-ray and pericardiocentesis should be done in time. Along with an analysis of the 2 fatal cases, the clinical types and therapeutic measures were discussed.

3. Tian, W. Q. et al. Uncommon clinical manifestations of amoebic liver abscess. Chinese Journal of Infectious Diseases, 1983, 1(4): 225 (In Chinese, with English abstract)

During the period of 1972-1981, 123 cases of amoebic liver abscess were admitted to hospital. In certain patients, uncommon clinical manifestations were observed, such as amoebic abscess of the left lobe of the liver in 17 patients (13.8%); heart damage in 5 (4.1%), including paroxysmal supraventricular tachycardia, frequent premature beats of the ventricle, atrial fibrillation, and S-T segment and T wave changes; jaundice in 5 (4.1%); splenomegaly in 8 (6.6%); oedema of the lower extremities in 10 (8.1%); and ascites in 4 (3.3%).

<sup>1</sup> It is intended to provide in the WHO/PROTOZOA series abstracts or translations in English of papers on protozoan infections (other than malaria and leishmaniasis which are dealt with separately in the WHO/MAL and WHO/LEISH document series) published in the Chinese medical and scientific press as most of this material is not readily available to interested readers outside China.

4. Du, Z. M. et al. Scanning, transmission and freeze-etching electron microscopy of Giardia lamblia cysts. Journal of Parasitology and Parasitic Diseases, 1984, 2(2): 99 (In Chinese, with English abstract)

Under scanning electron microscopy, the cysts were ovoid in shape, measuring approximately  $9-10 \times 6-7 \mu\text{m}$  and the surface of the cyst wall was rough instead of smooth. Viewed with the freeze-etching technique the cyst wall was composed of 10 or more laminar layers of membrane which were parallel to each other.

Under transmission electron microscopy, the cyst wall was found to be  $0.16-0.29 \mu\text{m}$  thick. A space was observed between the parasite and the cyst wall, in which flagellar structures were seen in cross-section. There were many vacuoles underlying the dorsal cell membrane of the parasite, but neither mitochondria nor endoplasmic reticulum or Golgi apparatus could be found except for granules of two different sizes. Sections through the nuclear region seemed to indicate the presence of two nuclei. The basal bodies were located near the midline, between the anterior poles of the nuclei, the emerging anterior, posterior-lateral and caudal flagella. Parallel rows of microtubules with perpendicular ribbon-like structures were randomly distributed in the cytoplasm.

5. Wang, Z. Y. et al. An investigation on toxoplasmosis in Beijing district. National Medical Journal of China, 1983, 63(12): 737 (In Chinese, with English abstract)

The sera of 811 adults (399 men and 412 women) and 49 newborn infants of Beijing were examined for antibody against surface membrane antigen of Toxoplasma gondii by the direct agglutination test. The antibody positive rate in the 811 adults was  $17.1\% \pm 1.3\%$  (with 11 IgG positives and 128 IgM positives). The positive rate in the 399 men was  $20.3 \pm 2.0\%$  and that in the 412 women was  $14.1 \pm 1.7\%$ , thereby indicating a striking difference between the sexes ( $P < 0.05$ ). The difference between the positive rate in 221 rural inhabitants ( $28.5 \pm 3.0\%$ ) and that in 590 urban inhabitants ( $12.9 \pm 1.4\%$ ) was significant ( $P < 0.01$ ). Of the 412 women, 392 were of fertile age and had a positive rate of  $13.5 \pm 1.7\%$ . Negative reactions were observed in both the 49 parturients and the 49 newborns. This testing method can detect IgM and IgG at the same time but the positives were mainly IgM. The titre distribution of both types of antibody was 1:8-1:128.

6. Yang, H. Z. & Xu, K. J. Studies on the serological diagnosis of toxoplasmosis. I. Purification of Toxoplasma gondii tachyzoites. Journal of Parasitology and Parasitic Diseases, 1984, 2(2): 88 (In Chinese, with English abstract)

A modification of the procedure described by Tsunematsu (1960) and Petrov (1974) was used for the purification of Toxoplasma parasites. Both pig and human strains of T. gondii maintained in mice by peritoneal inoculation were used. For parasite purification, peritoneal fluids were collected, digested with trypsin and filtered through a glass filter ( $G_3$ ) to remove host cells. Suspended parasites were freeze-dried for long-term preservation. For some batches of infected mice, parasites and host cells were counted before and after digestion and Evan's blue staining was adopted for the examination of parasite vitality. Parasite yield, purity, viability as well as recovery rate were determined and compared for different batches.

Application of this modified procedure resulted in an average parasite yield of  $(7.9 \pm 1.3) \times 10^6$  and  $(7.5 \pm 1.7) \times 10^6$  per mouse for pig and human strains respectively with no statistical difference ( $t=0.55$ ;  $P > 0.05$ ). A high purity of  $0.993 \pm 0.004$  after treatment as compared to  $0.668 \pm 0.18$  before treatment was obtained, the observed difference being highly significant ( $t=8.125$ ;  $P < 0.01$ ). The mean recovery rate as calculated from four batches was  $87.5\%$  ( $t=1.33$ ;  $P > 0.05$ ).

#### References

- Tsunematsu, Y. (1960) American journal of tropical medicine and hygiene, 9: 556.  
 Petrov, P. et al. (1974) Third International Congress of Parasitology. Section A 17, p. 312.

7. Yang, X. Z. et al. Analysis of the soluble antigens in the peritoneal exudate of mice infected with *Toxoplasma gondii*. Journal of Parasitology and Parasitic Diseases, 1984, 2(1): 36 (In Chinese, with English abstract)

Peritoneal exudate collected from mice infected with *Toxoplasma gondii* was centrifuged at 15 000 rpm (4°C) for 60 minutes, the supernatant being the soluble antigen (S). The sediment, a mixture of parasites and host cells, was suspended in distilled water and disrupted by ultrasonication at 330 mA for 5 minutes. After adding an equal volume of 1.7% NaCl, the suspension was centrifuged at 15 000 rpm (4°C) for 60 minutes, this supernatant being the disrupted body antigen (DB). Antigens S<sub>1</sub>, S<sub>2</sub> and S<sub>3</sub> were obtained from antigen S by precipitation with 30%, 60% and 100% ammonium sulfate respectively, and were further purified by Sephadex G-100 gel filtration. Using double diffusion, rocket immunoelectrophoresis and polyacrylamide gel electrophoresis, it appeared that antigen DB was superior to antigen S in sensitivity, but lacked the specific soluble component. The preparation of antigen S is rather simple. S<sub>1</sub> contains both the specific soluble component and the component identical with antigen DB. Therefore, it is recommended that S<sub>1</sub> be purified further for experimental purposes.

8. Zhao, S. L. et al. Preliminary observations on the ultrastructure and endodyogeny of *Toxoplasma gondii*. Acta Microbiologica Sinica, 1983, 23(4): 368 (In Chinese, with English abstract)

Most *Toxoplasma gondii* parasites are found in parasitophorous vacuoles of host cells. The parasite is crescent-shaped and enclosed in a pellicle composed of an outer membrane and an underlining inner membrane. At higher magnification, the outer membrane or the inner membrane and the wall of submembrane microtubules are seen to be composed of two layers. The anterior end of the organism contains a conoid which is located in three polar rings. The conoid consists of one or several groups of fibrils coiled as a spiral or compressed spring. Each group is composed of two parallel fibrils. Endodyogeny can be divided into five phases:

1. The Golgi body divided into two bodies which located near the nucleus.
2. Two groups of "opaque sheaths" were seen in the mother cell above the nucleus.
3. The sheaths extended backward and formed a hole at the posterior end. The chromatin of the mother cell nucleus moved through the hole into the nuclei of the two daughter cells.
4. The two daughter cells were formed, but they still remained in the single layered plasma membrane.
5. The cytoplasm of the mother cell underwent degeneration and gradually dropped off. The two daughter cells then separated from each other. The outer membrane of the mother cell became the outer membrane of the daughter cells.

9. Zhao, S. X. et al. A serological survey of toxoplasmosis in Beijing residents. National Medical Journal of China, 1984, 64(2): 66 (In Chinese, with English abstract)

In order to estimate the prevalence of toxoplasmosis in the Beijing area, a serological survey was conducted among the urban and suburban inhabitants. 569 serum samples were examined by one or more of the following methods: indirect haemagglutination (IHA) test, IgG fluorescent antibody (IgG-IFA) test, and IgM fluorescent antibody (IgM-IFA) test. The rates of infection were found to be 10.7% (58/542) by IHA, 14.7% (48/327) by IgG-IFA, and 5.8% (15/260) by IgM-IFA. Of the 569 sera, 310 were examined by IHA and IgG-IFA simultaneously; the rate of infection thus found was 23.5% (73/310). During the study, only one subject showed a significant rise in antibody titre. These findings indicate that the prevalence of toxoplasmosis in Beijing residents is not low, though active disease is rare.

The advantages and disadvantages of the six serological methods used in this study for detecting toxoplasmosis are discussed.