



ABSTRACTS OF RECENT CHINESE PUBLICATIONS ON HELMINTHIASES¹ (XXV)

327. Shi, Y.P., Cai, S.C., Zhang, D.X., Yang, W.P., He, X.M., Shao, J.G., Tang, Y.Z., Dong, K., Li, Q.R., Li, F.C., Liu, B.Y. & Yang, J.G. Combined chemotherapy with albendazole, pyrantel and oxantel for intestinal helminthiasis. Chinese Journal of Schistosomiasis Control, 1989, 1(2): 26-29 (In Chinese, with English abstract)

This study was designed to determine the most effective regimen of combined chemotherapy for intestinal helminthiasis. It was carried out on 441 patients who were divided into two main groups. Group 1 consisted of two subgroups as follows:

- (a) 111 patients (56 cases of Ascaris and 102 of hookworm infection) were treated with albendazole (300 mg per day for one day) plus pyrantel (150 mg twice a day for one day). At 3 weeks and at 5 months after treatment, the total negative rates for stool eggs were 73.9% and 61.3%, respectively, the negative rates for Ascaris being 98.2% and 81.5% respectively, and those for hookworm, 92.2% and 94.7%, respectively.
- (b) 109 patients (95 cases of Ascaris, 96 of hookworm and 98 of Trichuris infection) were treated with the same drugs and doses as above, with in addition oxantel (225 mg twice a day for one day). At 3 weeks and at 5 months after treatment, the total negative rates for stool eggs were 70.6% and 67.0%, respectively, the negative rates for Ascaris being 98.9% and 88.3%, respectively, those for hookworm, 92.7% and 90.1%, respectively, and those for Trichuris, 87.8% and 95.8%, respectively.

Group 2 also consisted of two subgroups as follows:

- (a) 120 patients (44 cases of Ascaris and 107 of hookworm infection) were treated with albendazole (600 mg per day for one day). At 3 weeks and at 5 months after treatment, the total negative rates for stool eggs were 75.8% and 56.7%, respectively, the negative rates for Ascaris being 100% and 88.6%, respectively, and those for hookworm, 88.8% and 79.6%, respectively.
- (b) 101 patients (91 cases of Ascaris, 88 of hookworm and 95 of Trichuris infection) were treated with albendazole (600 mg per day for one day) plus oxantel (225 mg twice a day for one day). At 3 weeks and at 5 months after treatment, the total negative rates for stool eggs were 72.3% and 50.5%, respectively, the negative rates for Ascaris being 94.5% and 86.9%, respectively, those for hookworm, 84.1% and 86.2%, respectively, and those for Trichuris, 93.7% and 93.3%, respectively.

¹ The WHO/HELM series has been chosen as a vehicle for issuing abstracts or translations in English of papers on helminthiasis published in the Chinese medical and scientific press as most of this material is not readily available to interested readers outside China. The numbering of the abstracts in this document is consecutive to that of the abstracts given in the previous WHO/HELM/89.30.

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The egg reduction rates in all of the above groups reached 90-100%. The drugs in combined use had no obvious side effects. The results of this study suggest that combined chemotherapy for intestinal helminths is effective not only in the short period (3 weeks) but also in the longer period (5 months), especially in hookworm and Trichuris infections.

328. Zhao, W.C. Director: Zhu, J.H. & Xie X.M. Inhibitory effects of extracts of Ascaris suum on human blood coagulation. Chinese Journal of Parasitology and Parasitic Diseases, 1988, 6(4): 275-277 (In Chinese, with English abstract)

The effects of various soluble extracts of Ascaris suum on human blood coagulation were studied. Whole worm extract could prolong recalcification time (RT) as well as kaolin-activated partial thromboplastin time (KPTT), but it did not alter prothrombin time (PT), thus indicating that the intrinsic pathway of blood coagulation was inhibited by this extract while the extrinsic pathway was not affected. Whole worm extract inhibited platelet aggregation induced by adenosine diphosphate (ADP), but it did not influence platelet aggregation induced by adrenaline. Neither whole worm extract nor body fluid caused fibrinolysis. In KPTT assays with three different extracts, the strongest anticoagulant activity was exhibited by cuticle extract while the activity of whole worm extract and body fluid was much weaker. These data suggested that anticoagulants of Ascaris existed mainly in the cuticle.

329. Wang, W.Y., Duan, Y.F., Xi, Z.H., Xie, L.G. & Director: Song, C.C. Detection of antibodies against human hookworms in experimentally-infected mice and naturally infected humans. Chinese Journal of Parasitology and Parasitic Diseases, 1988, 6(4): 264-267 (In Chinese, with English abstract)

Specific antibodies in the sera of mice experimentally infected with Ancylostoma duodenale or Necator americanus and of hookworm-infected human subjects were detected by the enzyme-linked immunosorbent assay (ELISA) using infective larval or adult worm antigens.

The antibody in the mouse model could be detected as early as 7 days after infection with A. duodenale and remained detectable for at least 90 days, with a peak on days 15-30 after infection. However, from days 5-45 after infection with N. americanus, antibody was detectable on day 5 and only lasted 45 days with a peak on day 10. It is suggested that the pattern of antibody response may be useful for early diagnosis of hookworm infection and that it may be closely related to the length of time that the larvae stay in the host tissues.

Sera from 40 patients showed positive rates of 87.5% and 62.5% with adult and larval antigens, respectively, of A. duodenale. ELISA might be useful as an immunodiagnostic method for hookworm infection and also as a seroepidemiological tool for mass surveys of ancylostomiasis.

330. He, S.Y., Yan, W., Sun, F.H., Xu, H.S., Tang, R.S., Jiang, H., Zhou, L.W., Li, R.Z., Zhang, H.X., Zhou, Z.P., Ni, Z.F., Li, T., Xue, L.F. & Xu, X.Z. Studies on the interruption of transmission of hookworm infection by chemotherapy. Chinese Journal of Schistosomiasis Control, 1989, 1(2): 15-18 (In Chinese, with English abstract)

Twenty villages in Jiangsu Province with different hookworm endemicities were selected to study interruption of transmission by combined chemotherapy with pyrantel pamoate and levamisole. It was found that transmission was successfully interrupted in all villages with a prevalence below 50% according to the interruption threshold for hookworm, i.e. infection rate <2%, egg per gram faeces (EPG) <4.0; but the number of treatment courses varied in villages with different degrees of endemicity. In 8 villages with a prevalence rate below 10%, only one course of treatment followed by 1-2 courses of

retreatment during the non-infective season was required. In 5 villages with a prevalence rate between 10% and 40%, two courses of treatment followed by 1-3 courses of retreatment during the non-infective season were used. In 1 village with a prevalence rate of 46.72%, 3 courses of treatment followed by 1-2 courses of retreatment during the non-infective season were needed. In 3 villages with a prevalence rate higher than 50%, even 3 courses of treatment followed by 1-2 courses of retreatment during the non-infective season were insufficient, since the prevalence rate was still 6.98-10.48% while the EPG was 3.69-6.45. In the remaining 3 villages with a prevalence rate between 14.04% and 40.53%, 2 courses of treatment followed by 1-3 courses of retreatment were used during the non-infective season, from November to May. The prevalence rates were reduced to 0.46-0.95% and the intensity of infection was very low, i.e. 0.14-0.94 EPG, and the interruption threshold for hookworm was reached.

331. Tang, C.M., Huang, J., Gan, Y.C., Wu, Q.H., Li, S.L., Yao, R.F., Xie, C.D., Xie, G., He, Q.M., Meng, R.B., Zhang, D.W., Lin, Z., Lin, P.J., Liang, S.T., Chen, S.Y., Wang, Z.M., Liang, J.M. & Lu, Y.J. Mebendazole-medicated salt in the control of hookworm infection. Chinese Journal of Parasitology and Parasitic Diseases, 1989, 7(1): 43-46 (In Chinese, with English abstract)

From 1984-1987, mass application of mebendazole-medicated salt was studied for the control of hookworm infection in 5 pilot areas (Wuming, Shanlin, Bobai, Guilin and Rongxian counties) in Guangxi Zhuang Autonomous Region. The dosages of mebendazole mixed in with the salt that were administered were 15 mg, 25 mg, 30 mg, 40 mg, 50 mg, 60 mg, 70 mg, 80 mg, 100 mg or 200 mg per person per day for 15, 20 or 30 days. It was found that 40 mg/day for 15-20 days could result in stool egg negative conversion rates of 92.3-94.4%, while 50 mg/day for 30 days resulted in rates of 96.9-100%. Concurrently, the hookworm infection rates in the pilot areas dropped by 57.9-71.7% within a short time, whereas the stool egg negative conversion rate for Ascaris lumbricoides was as high as 99.1-100% at the same dosage; when the dosage of 100 mg/day for 30 days was given, the egg negative reversion rate for Trichuris trichiura was 97.6%. Promising results were recorded regarding tolerance of the medicated salt, the side effects among the inhabitants being mild. In conclusion, the application of mebendazole-medicated salt was found to be a simple and effective measure in the control of hookworm infection, especially in overcoming the problems of incomplete mass detection and selective mass treatment. Furthermore, from a cost-effective point of view, it is far more economical.

332. Shen, H.X., Li, F.H., Dong, C., Yang, D.L., Hao, G., Yu, Z.Q., Wang, Y.K., Xia, N.S. & Hao, L.J. Preparation of antigen from infective larvae of Trichinella spiralis and comparison of three antibody detecting methods. Shanghai Journal of Immunology, 1988, 8(6): 457-459 (In Chinese)

Trichinella spiralis larval antigen was prepared from rabbits that had been experimentally infected by the oral administration of muscle tissue of freshly infected pigs. Serum samples from 123 patients with a history of eating T. spiralis contaminated pork were tested for the presence of antibody against T. spiralis using LAB-enzyme-linked immunosorbent assay (LAB-ELISA), indirect-ELISA and dot-ELISA which gave positive reactions in 60 (48.8%), 67 (54.5%) and 74 (60.2%) of these patients, respectively, with geometrical mean titres of 7988.34, 8729.71 and 31988.95, respectively. Cross-reactions between T. spiralis antigen and sera from patients with acute schistosomiasis were observed, suggesting that T. spiralis shared some antigens with Schistosoma japonicum.

LAB-ELISA was not as effective as dot-ELISA but no less effective than indirect-ELISA. All three methods proved to be specific and stable in antibody detection. They could, therefore be used in the diagnosis and epidemiological study of T. spiralis infection.

333. Pu, F.S. & Gao, T.F. X-ray manifestations of trichinosis on chest radiographs. Chinese Journal of Radiology, 1989, 23(1): 21-22 (In Chinese, with English abstract)

This article reports the results of chest radiographs of 14 patients with trichinosis, with special reference to X-ray manifestations, their pathological basis and their clinical significance. All the patients were males of Hani nationality; they were aged 23-53 years, had eaten dishes mixed with uncooked pork, and had developed symptoms such as fever, myalgia, oedema, increased levels of oxyphil cells in the blood, etc. The biopsies made three weeks after infection indicated that 13 of the 14 patients had trichinosis. The radiological findings included hilar enlargement, exaggerated and fuzzy lung markings, patchy infiltrations of varying sizes and fine nodular shadows. The pathological basis of these findings consisted of dilatation and congestion of pulmonary vessels and capillary beds and of intrapulmonary haemorrhagic lesions. The pulmonary radiological manifestations are helpful for evaluating the prognosis of the patient.

334. Yu, W.J. & Lian, J.N. Changes in populations of T lymphocytes in mice infected with Trichinella spiralis. Chinese Journal of Parasitology and Parasitic Diseases, 1989, 7(2): 94-96 (In Chinese, with English abstract)

Acid α -naphthyl acetate esterase (ANAE), a cytoplasmic marker, was used to identify T lymphocytes and their subpopulations in the peripheral blood of mice experimentally infected with Trichinella spiralis. It was found that the absolute numbers of lymphocytes and T lymphocytes increased in parallel on day 3 after infection, reaching a peak on day 14 and still remaining above the normal level on day 60. The spotted granular ANAE positive cells (i.e. helper T cells, T_H) were observed to decrease, while the scattered granular ANAE positive cells (i.e. suppressor T cells, T_S) increased, leading to a lowering of the T_H/T_S ratio which was most marked on day 14, returning to normal on day 60. The depression of the host immune function during T. spiralis infection might be related to the lowering of the T_H/T_S ratio.

335. Xu, S., Ding, B.L., Lu, X.J., Shen, H.X., Zhang, D.P. & Xiao, Y.K. Scanning electron microscopic observations on adults of Angiostrongylus cantonensis. Chinese Journal of Parasitology and Parasitic Diseases, 1989, 7(1): 32-34 (In Chinese, with English abstract)

Scanning electron microscopic observations were made on adult Angiostrongylus cantonensis. The apex of the head has a round mouth with two rows of 6 sensory papillae each around it. The papillae of the outer row are more rudimentary and inconspicuous. A pair of amphidial pores are visible on the external side of lateral papillae of the inner row. The surface of the body is covered with a circular striated cuticle and short longitudinal ridges lying between two circular cuticles. The two copulatory spicules at the posterior end of male worms have an obviously different morphology and have been named accordingly: the "tube-like" copulatory spicule and the "groove-like" copulatory spicule. The former, when enclosed in the latter, appears as a single spicule. The copulatory bursa of the males and the structures of the tail part of the female are also described.

336. Liang, H.K. Observations on the morphology of eggs of Angiostrongylus cantonensis. Chinese Journal of Zoonoses, 1989, 5(2): 30-32 (In Chinese, with English abstract)

Of the 1500 eggs of Angiostrongylus cantonensis examined, 15.33% were broadly oval (length: width <1.5:1), 74.07% oval (length: width 1.51-2:1) and 10.60% elongated oval (length: width <2:1). The egg shell, which was thin and hyaline, measured $33-64\mu \times 54-97\mu$ (average $44\mu \times 75\mu$). The eggs collected from the vagina of female adult worms were usually at the 1-cell stage, occasionally at the 2-cell stage, while those collected from the lungs of rats were at the 1-cell, 2-cell, 4-cell, 8-cell, morula, tadpole or even larval stage.

337. Su, D. M. & Cao, H.X. Comparative analysis of the soluble proteins of Echinococcus granulosus parasitizing cattle, sheep and humans by SDS-PAGE and its taxonomic significance. Endemic Diseases Bulletin, 1989, 4(1): 95-98 (In Chinese, with English abstract)

The protein components of bovine, ovine and human Echinococcus granulosus cyst fluids (EgCFs) and protoscoleces (EgPSs) were submitted to a comparative analysis using sodium dodecyl sulfate-polyacrylamide gel electrophoresis (SDS-PAGE). The protein components of the three EgCFs were found to be quite similar while those of the three EgPSs were different. The protein components of ovine EgPS were similar to those of human EgPS. However, the protein components of bovine EgPS were fewer than those of the other two, and the SDS-PAGE pattern of bovine EgPS was unusual. It is deduced that in Gansu Province the E. granulosus parasites of cattle, sheep and humans probably belong to the same strain, and the differences between bovine EgPS and ovine and human EgPSs are probably caused by hyperplasia of the protoscolex of E. granulosus when the same strain parasitizes a non-suitable intermediate host.

338. Li, X.L., Chai, J.J., Chao, H., Zhang, W.L. & Chang, Q. A silver-stained SDS-PAGE analysis of soluble protein of sheep Echinococcus granulosus from three different geographical areas in Xingjiang, China. Endemic Diseases Bulletin, 1989, 4(1): 90-94 (In Chinese, with English abstract)

The soluble protein components in hydatid cyst fluids and protoscoleces from the livers of naturally-infected sheep in three different geographical areas in Xingjiang, China, were analysed by silver-stained sodium dodecyl sulfate-polyacrylamide gel electrophoresis (SDS-PAGE). The electrophoretic patterns revealed a noticeably greater number of protein bands for protoscoleces than for cyst fluids. Cyst fluids and protoscoleces from different geographical areas were similar in composition. On the other hand, some characteristic differences were found among them. Cyst fluids from Qiriye in the eastern Kunlun mountains, from Fuhai in the Altai mountains and from Tekes in the western Tianshan mountains, had 26, 22 and 20 bands, respectively while the respective band numbers for protoscoleces were 36, 40 and 37 and those for the degraded ones were 23, 24 and 23. Scanning of the electrophoretograms also revealed differences. In conclusion, this study showed that regional differences existed in the soluble protein components of Echinococcus granulosus in Xinjiang and that silver-stained SDS-PAGE can be used for the taxonomy of subspecies of E. granulosus.

339. Chai, J.J., Wei, M.Y., Chang, Q., Fu, C., Yang, X., Cao, H., Mao, Y.D. & Jiao, W. A further investigation on the epidemiological significance of antibody detection in hydatid disease. Endemic Diseases Bulletin, 1989, 4(2): 1-7 (In Chinese, with English abstract)

In September-October 1987, a seroepidemiological survey was carried out in Fuhai County, Altai District, Xinjian. All the inhabitants of the village of Chighandgidi were examined by ultrasonograph and chest X-ray. The indirect haemagglutination (IHA) test and the enzyme-linked immunosorbent assay (ELISA) were also performed on blood samples collected by venipuncture. Of the 1420 subjects examined by ultrasonography and chest X-ray, 41 proved to have cysts (31 in the liver, 5 in the lungs, 1 in the liver and lung, 3 in the kidneys, and 1 in the kidney and abdominal cavity), the average prevalence rate being 2.9%. Of 714 Kazak nomads, 22 (3.1%) harboured cysts and, of 602 Han peasants, 19 (2.7%) had cysts. The prevalence rate increased with age, reaching 9.7% in those over 45 years old. Of 1341 persons tested by IgG-ELISA, 286 (21.3%) were positive, and, of 1270 serum samples examined by IHA, 24 (1.9%) were positive. The highest positive rate was in the 15-24 year age group. The ratio between prevalence and the ELISA seropositive rate was 1:7.6. Of the 41 cases of hydatid disease, 36 were examined serologically by IgG-ELISA, IgE-ELISA and IHA test, the positive rates for these three tests being 63.89%, 37.14% and 30.56%, respectively. In conclusion, it is considered that the use of ultrasonography and chest X-ray in mass screening can provide more exact information on prevalence, but that prevalence may also be usefully evaluated by serological tests, in particular IgG-ELISA.

340. Zhang, J.Y., Li, Y.B. & Yang, Y.R. Comparative values of homologous and heterologous antigens in the diagnosis of hydatidosis by ABC-ELISA. Chinese Journal of Zoonoses, 1989, 5(2): 19-22 (In Chinese, with English abstract)

The values of antigens from human hydatid fluid (HHF) and from gerbil alveolar hydatid (GAH) in the diagnosis of hydatidosis were compared. The sera of 82 patients with surgically confirmed hydatid disease, of 107 patients with non-hydatid diseases and of 86 healthy adults were investigated by ABC-ELISA (Avidin-Biotin-horseradish peroxidase Complex - Enzyme-linked ImmunoSorbent Assay) using both antigens. The following positive standard was used: $S/N > 2.0$ (S = serum in sample well; N = negative reference serum). The positive rates with HHF and GAH as antigens in the diagnosis of hydatidosis were 90.24% and 67.07%, respectively; the false positive rates were 4.08% and 3.57%, respectively. With HHF as antigen, the titre range was 1:3200-6400 in 73.8% of the patients with hydatidosis, but with GAH as antigen this titre range was found in a significantly lower percentage (45.12%) of these same patients. It was suggested that human hydatid fluid is more appropriate in the diagnosis of human hydatid disease. The incubation period was shorter in the present study (55 minutes) compared with that in the original experiment (2-4 hours).

341. Zhu, C.L., Ye, B.H., Zhu, X.L., Zhao, X.Z., Huang, J. & Zhang, J.Y. Preliminary study on antigens of hydatid fluid, protoscolex and capsule wall of Echinococcus by two-dimensional gel electrophoresis. Chinese Journal of Zoonoses, 1989, 5(2): 27-29 (In Chinese, with English abstract)

A preliminary study was made of antigens of hydatid fluid, protoscolex and capsule wall of Echinococcus using two-dimensional gel electrophoresis and silver stain. It was shown that: hydatid fluid had 111 polypeptide spots of which 74 were specific and 37 common spots; protoscolex had 116 of which 67 were specific and 49 common; and capsule wall had 123 of which 60 were specific and 63 common. Among the common polypeptide spots, 7 were shared by all three antigens, 8 by hydatid fluid and protoscolex, 22 by hydatid fluid and capsule wall and 34 by protoscolex and capsule wall. The relationship between the polypeptide spots and the antigens was discussed and it was concluded that the study results may have shed some light on the purification of antigens.

342. Miao, D.Q. & Yang, Q.L. Preparation and application of monoclonal antibodies against Echinococcus granulosus cyst fluid antigen. Shanghai Journal of Immunology, 1989, 9(1): inside back cover (In Chinese)

Monoclonal antibodies (MABs) were prepared by fusing myeloma cells SP2/0 with spleen cells of BALB/c mice immunized with hydatid cyst fluid (HCF) from human liver. The enzyme-linked immunosorbent assay (ELISA) was used to detect antibodies in hybrid culture supernatant, and positive hybrids were then cloned by the technique of limited dilutions. After cloning, five hybridoma cell lines (1D1, 1D8, 2D6, 4B10 and 4F4) were established, and the number of chromosomes was shown to lay within the range of 99-108.

Double-diffusion (DD), indirect haemagglutination (IHA), ELISA and indirect-ELISA were used to determine the sensitivity (titre) and specificity of five MABs. The titres of 1D1 and 1D8 reached $1:1024 \times 10$ in ELISA. The MABs 1D1 and 4F4 cross-reacted with antigens of Schistosoma japonicum, Paragonimus skjabini, Chlonorchis sinensis and Echinococcus multilocularis. It thus appeared that MABs 1D1 and 4F4 were against a common antigen determinant of different parasite antigens while MABs 1D8, 2D6 and 4B10 were against a specific antigen determinant of HCF.

MAB 1D8 (specific) and MAB 4F4 (non-specific) were then applied to analyse immunochemical characteristics of HCF antigens using immuno-electrophoresis (IEP), sodium dodecyl sulfate-polyacrylamide gel electrophoresis (SDS-PAGE), iso-electric focusing (IEF) and EITB. In IEP, the HCF antigens showed on only one reaction band with 1D8. In EITB, the HCF antigens (non-reducing) were recognized by 1D8 and formed one wide band located in the area of a protein with a relative molecular weight (M_r) of 120 000. It may be a complex composed of protein, lipid and polysaccharide. The human and sheep HCF antigens were separated by SDS-PAGE or IEF; these components were recognized by 1D8 and

4F4 with EITB. The results showed that specific reaction bands that were located in the M_r 48 000, M_r 24 000, M_r 17 000 and M_r 12 000 areas were thermostable glycoproteins. The isoelectric points of specific antigen components corresponded to pH 5.1, 5.7 and 5.8. These results show that there were no different specific antigen components between human and sheep HCF.

It was concluded that this study provided not only information on antigens but also a procedure for preparing standard antigen and for developing a new sensitive as well as specific method for the immunodiagnosis of hydatidosis.

343. Zhang, J.Y., Li, B., Li, B.Y., Wang, H., Zhu, K., Sun, Z.G. & Liu, J.X. Preliminary observations on the serum immunoglobulin levels in patients with alveolar echinococcosis before and during therapy with albendazole. Endemic Diseases Bulletin, 1989 4(1): 83-88 (In Chinese, with English abstract)

The serum IgG, IgA and IgM levels of 22 patients with alveolar echinococcosis before and after the start of treatment with albendazole were compared with the mean levels of 104 healthy adults by single radial immunodiffusion. The results indicated that before treatment and during treatment (i.e. after 2-3 months of albendazole therapy), the mean serum IgG concentrations in patients with alveolar echinococcosis were 507.19 IU/ml and 518.65 IU/ml, respectively, while the mean IgM concentrations were 238.75 IU/ml and 223.69 IU/ml, respectively. These values were significantly higher than the 134.59 IU/ml for serum IgG and 122.85 IU/ml for serum IgM in the healthy controls, but after 18 months of treatment the statistical significance of the P value changed from <0.01 to <0.05 . The serum IgG level, which rose for 1-3 months after the start of treatment, decreased more or less consistently thereafter: at 4-9 months, it was 469.987 IU/ml; at 7-9 months, 324.57 IU/ml; at 10-12 months, 302.20 IU/ml; at 13-18 months, 345.53 IU/ml; and at 19-24 months, 195.87 IU/ml. Serum IgA and IgM levels fluctuated during the periods of therapy. A significant reduction of the IgG-enzyme-linked immunosorbent assay (IgG-ELISA) antibody titre was noticed during the first month after the start of chemotherapy, and thereafter the titres fluctuated. A correlation was found between serum IgG levels and IgG-ELISA antibody titres only within 10-12 months after the start of albendazole treatment ($r = 0.54, -0.75, P < 0.05 - P < 0.02$).

344. Wang, H. Detection and clinical significance of specific anti-hydatid IgG and IgM in sera from patients with hydatidosis. Endemic Diseases Bulletin, 1989, 4(2): 52-56 (In Chinese, with English abstract)

The specific anti-hydatid immunoglobulins in sera from patients proved to have hydatid disease, including IgG and IgM antibody, were detected by the indirect fluorescent antibody technique (IFAT) using frozen section antigens of hydatid cyst walls. No false positive reaction to specific IgG and IgM antibody was found in sera from 44 normal persons, but specific IgG and IgM antibody reactions were found respectively in 96.39% and 19.28% of the sera of 83 patients with hydatidosis; these results revealed that IgG was the main specific antibody in sera of patients with hydatidosis. Moreover, specific IgG antibody was detected in 94.8% (55/58) of cases with hepatic hydatid cysts, 100% (16/16) of those with lung hydatid cysts and 100% (9/9) of those with hepatic and lung hydatid cysts. Specific IgM antibody was demonstrated in 9 patients with ruptured cysts, 3 with multiple (lung and liver) hydatid cysts and 4 with lung hydatid cysts. Specific IgM antibody was found in sera from patients with ruptured cysts, and positive rates were higher in sera from patients with lung hydatid cysts than in sera from patients with liver hydatid cysts, thus suggesting that specific IgM antibody levels in sera from patients with hydatidosis were related to the hydatid cyst condition itself.

345. Wang, H. Comparative studies on hydatid antigens of different origins in diagnosis of patients with hydatid disease by the indirect fluorescent antibody technique. Chinese Journal of Zoonoses, 1989, 5(3): 19-21 (In Chinese, with English abstract)

Frozen section specimens 4 μ m thick of hydatid cyst wall and smear section specimens of whole protoscoleces from sheep were compared with frozen section specimens of hydatid

cyst wall from yaks and humans that were used as antigen in the indirect fluorescent antibody (IFA) technique for the diagnosis of patients with hydatidosis. For this study, 41 patients with hydatidosis were chosen, and 72 persons (20 with cysticercosis, 8 with cancer and 44 healthy individuals) were used as controls.

In the diagnosis of hydatid disease by the IFA test using hydatid cyst wall antigens from sheep, yaks and humans, the positive rates were 97.6%, 39.0% and 100.0%, respectively, while the false positive rates were 16.7%, 12.5% and 100.0%, respectively. When protoscoleces antigen from sheep and cyst fluid antigen were used, the positive rates for diagnosis of hydatid disease by the indirect haemagglutination (IHA) test were 90.2% and 85.4%, respectively, while the false positive rates were 15.3% and 11.1%, respectively. The difference between the positive rates in the diagnosis of hydatid disease using the IFA test with hydatid cyst wall antigen from sheep and the IHA test with cystic fluid antigen was statistically significant ($P < 0.05$). In conclusion, the hydatid cyst wall antigen from sheep was more sensitive and specific than these antigens from yaks and humans in the diagnosis of human hydatidosis by the IFA technique.

The sensitivity of IFA and IHA in the diagnosis of hydatidosis in different organs was not the same. The positive rates were 87.5% for IFA and 37.5% for IHA in the diagnosis of pulmonary hydatidosis, and 100% for IFA and 96.6% for IHA in the diagnosis of hepatic hydatidosis, the difference between these two methods being statistically significant.

346. Zhang, J.Y., Li, F.R. & Huang, J. A comparison of homologous and heterologous antigens in the diagnosis of alveolar hydatid disease. Endemic Diseases Bulletin, 1989, 4(2): 42-43 (In Chinese, with English abstract)

A comparison was made of the diagnostic value of antigen from human hydatid fluid (HHF) and antigen from gerbil alveolar hydatid (GAH). These antigens were used in ABC-ELISA (Avidin-Biotin-horseradish peroxidase Complex-Enzyme-Linked ImmunoSorbent Assay) which was applied to sera from 71 patients with multilocular echinococcosis, 107 patients with other diseases and 86 healthy adults. The following results were reported.

(1) When the sera were diluted to 1:200 and an S/N (S - serum in sample well/N - negative reference serum) of >2.2 was taken as positive, the sensitivity of ABC-ELISA with HHF antigen and GAH antigen in patients with alveolar disease was the same (i.e. 98.6%). The difference in false positive reactions in the tests between HHF (3.63%) and GAH (2.07%) antigens was not significant ($t = 0.92$).

(2) The S/N value was above 6.0 in 67.61% of patients with alveolar hydatidosis when HHF antigen was used, this percentage being significantly higher than the 36.62% obtained with GAH antigen ($t = 3.89$), while in patients with unilocular hydatids the positive rates with HHF and GAH antigens were 59.75% and 6.09%, respectively, the difference also being statistically significant ($t = 8.91$).

(3) 67.61% of patients with alveolar hydatidosis responded to ABC-ELISA with HHF antigen at titres of $>1:6400$, and 74.61% responded to ABC-ELISA with GAH antigen; the difference between them was not statistically significant. It is suggested that both antigens were appropriate for use in the diagnosis of alveolar hydatidosis.

(4) In patients with multilocular echinococcosis, the geometric mean titre with GAH was 1:8577.39, that is 1.14 times that with HHF (1:7555.04); but in patients with unilocular hydatids, the geometric mean titre with HHF (1:2891.39) was 2.31 times that with GAH (1:1252.15). It is suggested that the homologous antigen is more appropriate for use in the diagnosis of unilocular and multilocular hydatidosis.

(5) In patients with multilocular hydatidosis, considerably higher geometric mean titres were obtained than in those with unilocular hydatidosis. With HHF antigen, the

geometric mean titre was 2.61 times higher in the former than in the latter, while with GAH antigen it was 6.85 times higher in the former than in the latter.

347. Su, D.M., Cao, H. X. & Wen, B.G. Immunochemical analysis of hydatid fluid from different sources as diagnostic antigen in human hydatidosis. Chinese Journal of Parasitic Disease Control, 1988, 1(1): 29-31 (In Chinese, with English abstract)

The differences among ovine (OEgCF), bovine (BEgCF) and human Echinococcus granulosus cyst fluids (EgCF) as diagnostic antigens of human cystic hydatidosis were systematically analysed by immunochemical methods: Western blot, immuno-electrophoresis (IEP), and ABC-ELISA (Avidin-Biotin-horseradish peroxidase Complex-Enzyme-Linked ImmunoSorbent Assay). Slight differences were seen in their protein components and immunogenic proteins. IEP showed that the migrating distance was different for the three antigens which were, however, able to recognize the same antibody. In ABC-ELISA, the reactions of the antigens from the three different sources to 30 cases of human cystic hydatidosis showed no statistically significant difference. The regressional coefficients (slopes) of antigens of ovine, bovine and human sources were 0.1063, 0.1097 and 0.1237, respectively, indicating that all three antigens could be used in the detection of human hydatidosis.

348. Huang, Q.H., Yang, G.M., Tan, Q., Qiu, D.C. & Luo, Y. Studies on the use of freeze-dried red cells in the indirect haemagglutination test for diagnosis of hydatid disease. Endemic Diseases Bulletin, 1988, 3(4): 31-34 (In Chinese, with English abstract)

The indirect haemagglutination (IHA) test using freeze-dried sensitized red cells was used to examine sera from 45 patients with hydatid disease, 77 patients with other parasitic infections and 100 healthy individuals and the results were compared with those obtained with the IHA test using freshly sensitized red blood cells. When freeze-dried red cells were used in the test, the positive rate was 91.1%, the false positive rate of sera from healthy individuals was 0% and the cross-reaction rate with sera from cysticercosis patients was 29.2%. When freshly sensitized red blood cells were used, the positive rate was 91.1%, the false positive rate was 1% and the cross-reaction rates with clonorchiasis and cysticercosis were 4.8% and 41.7%, respectively. These results indicated that there were no significant differences in sensitivity and specificity between the two kinds of red cells. Moreover, freeze-dried red cells stored at 4°C for 18 months remained potent with little change in titre.

349. Wang, H., Shi, D.Z. & Lui, D.S. Application of the indirect fluorescent antibody test with blood spot on filter paper in the diagnosis and epidemiological survey of human hydatidosis. Endemic Diseases Bulletin, 1988, 3(4): 70-73 (In Chinese, with English abstract)

The indirect fluorescent antibody (IFA) test with blood spot on filter paper and with frozen section of hydatid cyst wall from sheep as antigen was employed in the diagnosis and epidemiological survey of human hydatidosis in 1986-1988. Serum samples and blood spots collected from 13 hydatidosis patients showed a positive rate of 100%, while of the 24 healthy students similarly examined only one serum sample showed a false positive reaction.

Positive rates in various counties in Gansu Province were 4.78% (12/251 persons from Tianzhu County), 5.37% (13/242 persons from Zhangxian county) and 1.17% (8/683 persons from Huining county) when blood spots were examined by the IFA and IHA tests, and no significant difference was observed between the two methods.

The IFA test, therefore, proved to be highly sensitive and specific in the diagnosis of hydatidosis. Since it is easy to prepare the antigen and to collect the blood required by this test, it can be used in seroepidemiological surveys to assess hydatidosis infection rates in endemic areas.

350. Cao, H.X., Su, D.M., Zheng, Y.X., Zhou, B.Y. & Mao, X.L. ABC-ELISA in the detection of specific IgE in patients with hydatidosis. Chinese Journal of Parasitology and Parasitic Diseases, 1988, 6(4): 253-255 (In Chinese, with English abstract)

A simple and sensitive immunoenzymatic assay - ABC-ELISA (Avidin-Biotin-horseradish peroxidase Complex-Enzyme-Linked ImmunoSorbent Assay) - for the detection of anti-hydatid specific IgE antibodies is described. Sera from 40 patients with hydatidosis were tested by both ABC-ELISA and conventional ELISA and the results showed the former to be more sensitive than the latter, particularly in cases with lower levels of IgE. In serum samples diluted at 1:100, the positive rates were 92.5% and 82.5%, respectively, while in serum samples diluted at 1:200 they were 75% and 57.5%, respectively. Non-specific reactions in 24 cases with cysticercosis cellulosae and in 25 cases with allergy were not significantly different between the two methods. The average levels of total IgE as measured by ABC-ELISA in patients with hydatidosis, cysticercosis or unspecified allergies and in 25 healthy blood donors were 5982.96 IU/ml, 3449.88 IU/ml, 1334.43 IU/ml and 1150.54 IU/ml, respectively, with deviation from the geometric mean showing statistically significant differences.

351. Ye, Y.C., Chen, Q.M., Hai, P., Chai, F.L. & Zhou, S.X. Effect of d-hydrastine on the ultrastructure of experimental Echinococcus granulosus cyst in mice. Acta Pharmacologica Sinica, 1989, 10(2): 185-187 (In Chinese, with English abstract)

A study was made of the ultrastructural changes in the germinal membranes of Echinococcus granulosus cysts in mice treated with d-hydrastine (3.7 mg/kg body weight/day administered intragastrically for 20 days). In cysts from d-hydrastine-treated mice the following changes were observed by transmission microscopy: dissolution of the microtriches; disturbance in the arrangement of organelles; dilatation and disruption of microtubules; increase in size and number of lysosomes; decrease in number of Golgi complexes; and decrease in density and swelling of mitochondria. By scanning electron microscopy, many pits arising from the outer and inner surfaces of the germinal membrane were observed. It thus appears that d-hydrastine has a profound intracellular effect on experimental E. granulosus cysts in mice and that it may be a promising drug for treating hydatidosis.

352. Wang, H. Transmission electron microscopic observation of the primary Echinococcus granulosus in sheep after albendazole treatment. Endemic Diseases Bulletin, 1989, 4(1): 99-101 (In Chinese, with English abstract)

Ultrastructural changes in the laminated layer and the germinal membrane of hydatid cysts from sheep treated with albendazole were observed by transmission electron microscopy. Cysts from the albendazole-treated sheep showed a loosened base and regional necrosis in the laminated layer. Shedding or disappearance of microtriches, increased vacuolization of the tegument of the germinal membrane, disturbance in the arrangement of organelles, dilatation and disruption or disappearance of microtubules, increase in size and number of lysosomes, decrease in number of Golgi bodies, vacuolization of mitochondria, damage of the nucleus membrane, etc., were also observed. Albendazole clearly seems to have a profound intracellular effect on the germinal membrane of primary Echinococcus granulosus cysts in sheep.

353. Xiao, S.H., Shen, B.G., Yang, Y.Q., You, J.Q., Xu, D.H., Chai, J.J. & Zhang, W.L. Effect of praziquantel and albendazole on the ultrastructure of the protoscolex of Echinococcus granulosus. Acta Pharmacologica Sinica, 1989, 10(3): 285-287 (In Chinese, with English abstract)

When protoscolexes of Echinococcus granulosus, maintained in 20% calf serum-RPMI 1640, were exposed to 1 µg/ml praziquantel for 1-48 hours, severe damage to their ultrastructure was observed. The main lesions of the tegument included blurring of the matrix, vacuolization and peeling. Vacuolization of the perinuclear cytoplasm in tegumental cells, focus lysis in muscle bundles, and destruction of collection ducts and flame cells were also seen. These observations suggest that the damage done to the

tegument, collection ducts and flame cells may interfere with the functions of nutrition and defence of the protoscolex and destroy the osmoregulatory system, all of which may be major causes of death of the protoscolex during treatment with praziquantel.

When protoscolexes were exposed to 20 µg/ml of albendazole for 24-72 hours, no apparent damage to the tegument was detected, except for some network-like structures that appeared in the cytoplasm of tegumental and parenchymal cells.

354. You, J.Q., Jiao, P.Y., Guo, H.F., Gao, F.H., Xiao, S.H., Chai, J.J., Zhang, W.L. & Jiao, W. Screening drugs against hydatid cysts harboured in mice. Endemic Diseases Bulletin, 1989, 4(2): 44-51 (In Chinese, with English abstract)

Mice, that had each been inoculated with 2000 protoscolexes of Echinococcus granulosus 5-6 months before, were used as animal models for the screening of drugs. The 89 compounds that have been tested include benzimidazoles, thiodiazole compounds, praziquantel analogues, and phenthiourezine and other insecticides. Mebendazole was orally administered at a dosage of 100 mg/kg/day for 10 days to an experimental group of 12 mice, while each of the other compounds was similarly administered but at a dosage of 200 mg/kg/day. A compound was considered to be effective only when the inhibition rate (IR) of hydatid cysts was greater than 40%. Among the compounds screened, mebendazole and albendazole showed a better therapeutic effect on hydatid cysts (IR of 81.6% and 61.6%, respectively). Thiodiazole compounds, praziquantel analogues and phenthiourezine also exhibited some effect against hydatid cysts in mice.

355. Li, Y.Y. & Xie, X.M. Comparison of disc-PAGE protein patterns of Cysticercus cellulosae from Tianjin, Shenyang and Zhengzhou. Chinese Journal of Parasitic Disease Control, 1989, 2(1): 27-29, 58 (In Chinese, with English abstract)

Disc-polyacrylamide gel electrophoresis (disc-PAGE) was used to analyse the proteins of the larvae of Taenia solium (Cysticercus cellulosae) collected from different geographical areas.

Samples from Tienjin, Shenyang and Zhengzhou showed somewhat similar protein patterns. However, some differences were still noticed, mainly in the Rf values of the main bands. Mono-factor variance analysis showed significant ($P < 0.05$) or even highly significant ($P < 0.01$) differences among the main bands of the cyst walls, cyst fluid and bands 4, 8, 11, 13 of the scolex. The comparative study suggested that protein electrophoretic properties of T. solium larvae varied among different populations and provided collateral evidence confirming the existence of serotypes.

356. Yang, R.Q., Mao, F.R., Wang, Y.Z., Yan, S.M. & Liu, B. A comparison of the indirect immunoenzyme test with the indirect fluorescent antibody test in the diagnosis of porcine cysticercosis. Journal of Henan Medical University, 1989, 24(1): 156-157 (In Chinese)

A comparative study was made between the indirect immunoenzyme test (IET) and the indirect fluorescent antibody test (IFAT) in the diagnosis of porcine cysticercosis using frozen section antigen of Taenia solium larvae (Cysticercus cellulosae). Among 65 cases, 34 were of the dermal-muscle type, 16 of the cerebral type, 14 of the mixed type and 1 of the ocular type. The positive rates demonstrated by IET were 76.0%, 62.5%, 100% and 100% for each type, respectively, and those by IFAT were 73.5%, 75.0%, 100% and 100%, respectively. The results of both tests were in accordance with the results of biopsy. The coincidence rate was 94.1% for the dermal-muscle type and 100% for the mixed type. In the diagnosis of porcine cysticercosis, IET is as effective as IFAT. However, the use of IET is simpler and more practical because the samples are easy to store and it is therefore superior to IFAT for the diagnosis of porcine cysticercosis.

357. Zheng, L.F., Li, M.G., Liu, D.H., Zhang, W.L., He, Z.Y., Zhao, M.H. & Zhao, G.H. Study of factors influencing the efficacy of albendazole treatment of cerebral cysticercosis cellulosae. Chinese Journal of Parasitology and Parasitic Diseases, 1989, 2(1): 67 (In Chinese)

Cerebral cysticercosis cellulosae in 118 patients was treated with albendazole. The patients were divided into two groups: group 1 consisted of 56 patients treated with 3 courses of the drug at a dosage of 15-20 mg/kg body weight/day for 10 days per course and with a 10 day interval between courses; group 2 consisted of 62 patients treated with 2 courses of the drug at a dosage of 25 mg/kg/day for 20 days per course, and with a 20-day interval between the courses. A computed tomography (CT) examination was made every six months after treatment. It was found that foci could be absorbed within six months, but some were only absorbed after two years. New foci were observed in four patients at the 12-month (1 patient), 18-month (1) and 24-month (2) follow-up.

Among the 118 patients, the cure rates varied with the different types of cerebral cysticercosis. For the encephalitis type the cure rate was 44.4% (8/18), for the cerebral parenchymal type the rate varied from 15.2-33.3% for the 51 patients affected, and 3 cases of ventricle type and 46 cases of mixed type were cured. A significant difference in cure rates was noticed between the two treatment groups. In group 1, seven patients (12.5%) were cured and 29 (51.8%) improved, while in group 2, 17 patients (27.4%) were cured and 23 (37.1%) improved ($P < 0.01$). An analysis of the relationship between age and cure rates revealed that better results were obtained in young and adult patients with the larger dosage of 25/mg/kg/day.

358. Wei, G. Z., Li, C.J. & Xiao, Z.X. Cysticercosis of the central nervous system. A clinical study of 1400 cases. Chinese Journal of Internal Medicine, 27(7): 405-408 (In Chinese, with English abstract)

Among the 1400 cases of cysticercosis of the central nervous system that were studied, 1064 were male and 336 were female, with 62.6% of them being between the ages of 31 and 45 years. According to the classification prevailing in China, the cases were divided into the epileptic type (561 cases), the subarachnoid type (129 cases), the cerebral parenchymal type (184 cases), the intraventricular type (102 cases), the mixed type (419 cases) and the asymptomatic type (5 cases). Epilepsy was the most common symptom while meningitis or adhesive arachnoiditis was the most catastrophic complication of neurocysticercosis. Other manifestations were stroke, encephalitis, headache without hydrocephalus, cerebral parenchymal inflammation and solitary large cysts. These last may mimic intracranial tumours and present a difficult diagnostic challenge. The computed tomography (CT) scan is virtually the most useful method in diagnosing neurocysticercosis. Praziquantel was effective and clinical improvement occurred in 64.4% of the cases. There is no doubt that the use of praziquantel represents a major advance in the treatment of neurocysticercosis.

359. Li, Y.J., Chen, Y., Wang, K.H., Wang, G.R. & Wang, L.H. Investigation of doubtful cerebral cysticercosis patients infected with Toxoplasma. Journal of Harbin Medical University, 1989, 23(1): 16-17, 15 (In Chinese, with English abstract)

Toxoplasmosis is not uncommon in China, the average infection rate being 4-9%, but not many cases are in fact clinically detected. To obtain a general picture of the status of toxoplasmosis infection in doubtful cerebral cysticercosis patients, a seroepidemiological investigation was conducted in suspected patients with epilepsy, headache and neurasthenia, followed by an analysis of the results. Serum samples from 1368 suspected patients were examined and 213 (15.6%) were found to be positive. Individuals of both sexes and of different ages and occupations were investigated and the infection rate was found to be slightly lower in males (14.8%) than in females (16.7%). No positive case was found among those over 60 years of age. Among persons with different occupations, i.e. workers, peasants, officers, students and housewives, peasants were found to have the highest infection rate (19%). Among the suspected patients, those with epilepsy had the highest positive rate of 20.8% (151/725), followed by headache patients 10.7% (26/242) and neurasthenia patients 8.9% (36/404). There was an obvious statistical difference between persons keeping cats (25.5%, i.e. 106/415) and

those who did not (11.2%, i.e. 107/953). This study revealed that the toxoplasmosis rate in suspected cerebral cysticercosis patients reached 15.6%, which is above the average infection rate. Close attention should be paid to Toxoplasma infection in patients with certain neurotic conditions and cerebral diseases.

360. Tian, D.P., Si, L.S. & Zheng, B.J. An autopsy report of massive infection with immature Cysticercus cellulosae. Chinese Journal of Parasitology and Parasitic Diseases, 1989, 7(1): 74 (In Chinese)

A 2-years-and-4-months old girl was hospitalized with complaints of high fever, headache, coma, convulsions and vomiting, and her case was clinically diagnosed as disseminated encephalitis complicated by bronchitis. She died five days after hospitalization. Autopsy revealed 623 rice grain-like foci on the brain surface. The cysts, which each measured 0.1-0.3 cm in diameter, were of a delicate grey or brownish red colour, were filled with transparent fluid, and were surrounded by an intense infiltration of macrophages, neutrophils, lymphocytes and eosinophils. Another 102 cysts were found on the heart surface. Cysts and lesions were also seen in the lungs, liver, kidneys, tongue muscles, sublingual muscle group and mesentery lymph nodes. Small cysts were found in small blood vessels in the brain, heart, liver and lungs. An indirect immunofluorescent assay using human anti-Cysticercus anti-serum showed specific fluorescent reactions. According to the course of development of Taenia solium larvae (Cysticercus cellulosae) in the human body, those cysts that were in the blood vessels were 8 days' old while the rest were 20 days' old. In the history given by the patient's parents, it was noted that tapeworm segments had been expelled and eggs found. Since taeniid eggs were recovered at autopsy, this case might be one of auto-infection.

361. Fan, Y.Q. Report on 2 cases of human Hymenolepis diminuta infection. New Chinese Medicine, 1989, 20(4): 193-194 (In Chinese)

Two cases of human Hymenolepis diminuta infection were reported in Changan County Hospital, Zhejiang Province, in 1987. The two patients were both males. One patient complained of periumbilic pain and loss of appetite, the other of an increased stool frequency. Upon admission, nothing was found abnormal in their physical examinations. A large number of H. diminuta eggs and segments were detected in their stools. They were given praziquantel at dosages of 15 mg/kg and 25 mg/kg, respectively, for treatment. No severe side effects were observed. Five days later, negative conversions were seen in the stool examinations and the patients were discharged.

Hymenolepis diminuta infection is a kind of zoonosis. Rodents are the main hosts, while the intermediate hosts are fleas, beetles, cockroaches, etc., which all have a close relation with daily human life. Eating underbaked bread or cake might be an infection route. The treatment of choice is praziquantel.

362. Fan, S.Q. & Sun, M.F. First case of Mesocestoides lineatus infection reported in China. Chinese Journal of Parasitology and Parasitic Diseases, 1989, 6(4): 310 (In Chinese)

Mesocestoides lineatus is known as a tapeworm of carnivores. Human cases have been reported in the United States of America and Japan. No case has previously been reported in China. In this article, the infection is reported in a 20-month-old baby girl, who was born in Heilongjiang Province. In April 1987, the baby was found emaciated with a poor appetite, but nothing abnormal upon physical examination. A white grainy contractile substance could be seen in the stool which upon closer examination proved to be gravid proglottids and eggs. A morphological study showed the following: the body length/breadth of the worm was 63 cm/0.5-2.5 mm, its head diameter was 0.5 mm, and the adult worm had 4 suckers and 982 proglottids. These worms were identified as Mesocestoides lineatus.

The baby was treated with 0.4 g of "anti-cestode" pills (the authors do not specify what drug it was) and 2 g of magnesium sulfate. After treatment, 5 whole worms and 877 gravid proglottids were excreted. No gravid proglottids were found in the stool at follow-up examinations one week and six months after drug administration.

363. Wang, H.P., Liu, T.C., Chen, H.G. & Liu, Y.J. Comparative study on phosphoglucosmutase isoenzyme in two types of Fasciola hepatica by isoelectric focusing. Journal of China Medical University, 1989, 18 (3): 181-183 (In Chinese, with English abstract)

A phosphoglucosmutase (PGM) isoenzyme analysis in diploid and triploid types of Fasciola hepatica was conducted using isoelectric focusing. Samples were absorbed on to strips of filter paper 0.5 x 1 mm in size before insertion into polyacrylamide gel. The sample amount was usually 30-40 μ l. Electrophoresis was carried out on LKB2117 multiphor for 2 hours.

Eleven and 14 enzymatic bands with a pH range between 3.5 and 9.5 were observed in the diploid and triploid types respectively. There were three bands with a pH range between 7.25 and 8.30 in the diploid type, which were not seen in the triploid type. One located at pH 7.25 was of medial enzymatic activity and was composed of two sub-bands; another band at pH 7.5 was broad with a relatively stronger intensity of staining; still another band at pH 7.85 was weaker in activity. In the same region of pH three bands observed in the triploid type were identical with those in the diploid type. Three other bands in the triploid type could be differentiated from diploid bands by their enzyme activities and patterns. One band was at pH 7.70 with medium intensity; the second at pH 8.10 was broad in size and strong in density, probably with a thin sub-band; the third at pH 8.30 was broad in size and weak in activity.

The different patterns between the two types of the parasite were shown to be stable and reproducible. It was suggested that genetic differentiation had occurred in the two types of F. hepatica, and that this may provide an important basis for considering the phylogenetic relationship and the taxonomic status of the two types.

364. Weng, Y.L., Zhuang, Z.L., Jiang, X.P., Lin, G.R. & Lin, J.J. Studies on ecology of Fasciolopsis buski and control strategy of fasciolopsiasis. Chinese Journal of Parasitology and Parasitic Diseases, 1989, 7(2): 108-111 (In Chinese, with English abstract)

Development of the eggs of Fasciolopsis buski requires oxygen and the eggs cannot survive anaerobic conditions. The eggs have some resistance to low temperature and can be maintained at 4°C for 3 to 4 months; however, they are killed at 50°C within four hours. The presence of salts can influence the development time of the eggs and reduce their hatching rate.

Encysted cercariae exist not only on aquatic plants, but also on the surface of the water. The number of encysted cercariae floating on the water surface is about 3.6% of the total number of encysted cercariae. A study of case histories showed that 10.3-12.8% of infected persons and 35.1-40% of infected pigs had possibly become infected by drinking water contaminated with encysted cercariae.

It was suggested that fermented silage be used to feed pigs instead of fresh aquatic green fodder so as to prevent infection of the animals. In addition, aquatic plants, such as water chestnut, should be boiled for 1 to 2 minutes before eating to kill any encysted cercariae on the plants.

365. Zhan, X.M. & Xu, B.K. Analysis of the morphological variations among two species of adult lung flukes from ten geographical areas in China. Chinese Journal of Parasitic Disease Control, 1988, 1(1): 21-24 (In Chinese, with English abstract)

Two species of human lung fluke, Paragonimus westermani and Pagumogonimus skrjabini, from 10 different geographical areas in China were identified using an IBM computer with dBASE II and according to the criteria established on the basis of the morphological characteristics of the holotypes and paratypes. The results were as follows:

(1) In specimens identified as Paragonimus skrjabini from Guangdong, Hunan, Henan, Sichuan and Shanxi Provinces, morphological variations were observed among populations from the same locality as well as among those from different localities. Morphological comparison made between the type specimens from Guangdong and those collected outside the type locality indicated that specimens of Guangning County (Guangdong Province) and those from the adjacent Province of Hunan showed less diversity than those from far away provinces (e.g., Henan, Sichuan and Shanxi).

(2) The length/width ratio of the body of Paragonimus westermani seems to dwindle from south to north: 2.17 for specimens from Meixian County, Guangdong Province; 1.92 for those from Jiangxi and Zhejiang Provinces, 1.80 for those from Anhui Province and 1.57 for those from Jilin Province.

366. Dong, C., Peng, W.D., Huang, Y.Y. & Zhou, X.M. Paratenic transfer induced by mice infected with Paragonimus westermani cercariae. Chinese Journal of Parasitology and Parasitic Diseases, 1988, 6(4): 281 (In Chinese)

In 15 mice that had been orally infected with Paragonimus westermani cercariae isolated from the naturally-infected snail host, Semisulcospira libertina, 32 stunted juvenile worms were found, chiefly in the striated muscles, 30 days after inoculation of the cercariae. The size and internal structure of the stunted juveniles were similar to those of encysted metacercariae. Of the 32 stunted juveniles, 30 were transplanted orally into a dog and after 60 days in this final host, worms were detected in its lungs. This shows that paratenic transfer can be induced by a paratenic host infected with cercariae as well as by one infected with metacercariae or stunted juveniles.

It has been repeatedly proved that several species of wild rodents and insectivores, such as Rattus fulvescens, R. norvegicus and Suncus murinus, are paratenic hosts of P. westermani in endemic areas. Rodents may be infected by metacercariae, stunted juveniles or cercariae of schistosomes and induce paratenic transfer. Thus, the routes of transmission of P. westermani would be varied and complex.

367. Shi, Z.M. & Shen, Y.P. Detection of circulating antigens in human Paragonimus westermani by means of a double sandwich method enzyme-linked immunosorbent assay (DS-ELISA) using monoclonal antibodies. Chinese Journal of Schistosomiasis Control, 1989, 1(2): 35-37 (In Chinese, with English abstract)

Sera of 38 patients infected with Paragonimus westermani and of 30 healthy controls were used in a study on the detection of circulating antigen of P. westermani. Monoclonal antibodies from B2-B2 and B5-D3 strains were used in a double sandwich enzyme-linked immunosorbent assay (DS-ELISA). The positive rate of circulating antigen detection by DS-ELISA was 100% (38/38) in paragonimiasis patients while, in the control group, no circulating antigen could be detected.

368. Zhao, J.B., Huang, S.Y. & Zhao, S.Y. Comparative study on chromosome C-banding in diploid and triploid types of Paragonimus westermani. Chinese Journal of Parasitology and Parasitic Diseases, 1989, 7(2): 103-104 (In Chinese, with English abstract)

Diploid and triploid types of Paragonimus westermani had similar chromosomal karyotypes, but differed in chromosome C-band patterns. Two of three homologues of the triploid resembled those of the diploid in the C-banding pattern, while the remaining chromosomes showed a different pattern. Heterogeneity in homologues was observed especially in chromosome Nos. 2, 3, 5, 6 and 7. In the diploid chromosome specimen, mitotic and meiotic phases were observed, while only the mitotic phase was found in the triploid chromosome.

369. Wang, M., Directors: Zhu, S.H. & Xiao, X.C. Histochemical studies on some enzymes in Clonorchis sinensis. Chinese Journal of Parasitology and Parasitic Diseases, 1989, 7(1): 40-42 (In Chinese, with English abstract)

The localization of some enzymes in adult worms of Clonorchis sinensis was studied by histochemical methods. Acid phosphatase was detected mainly in the digestive duct, the subtegument and the walls of the testis, uterus and ovary; acetylcholinesterase was found in the oral sucker, ventral sucker and pharynx; and adenosinetriphosphatase was found to exist in the oral sucker, ventral sucker, pharynx and muscle layer in the subtegument. The eggs of C. sinensis possessed the above three enzymes.

370. Pang, X.L., Li, B.Z., & Yu, X.H. A report on the histochemical study of Clonorchis sinensis. Chinese Journal of Zoonoses, 1989, 5(2): 83-85 (In Chinese, with English abstract)

A histochemical study was made of the distribution and location of different components in Clonorchis sinensis body tissues. The distribution of glycogen, protein, lipid, DNA, RNA, acid phosphatase (ACP), and phenolase in different tissues of this worm was identical with that previously reported. However, the activity of alkaline phosphatase (ALP) was found to be weak in the vitelline glands and epithelial cells of the intestine. The distribution of five enzymes: succinic dehydrogenase (SDH), malate dehydrogenase (MDH), monoamine oxidase (MAO), glucose-6-phosphatase (G-6-P) and Ca-adenosine triphosphate (Ca-ATP), is described for the first time. It was found that the activities of SDH, MDH and MAO were prominent in the worm tegument, subtegument, testis, ovary and sucker. SDH and MDH activities appeared to be high throughout the worm body, while the activity of MAO was relatively weak. The activity of both G-6-P and glycogen appeared to be dominant in the subtegument and the parenchymal tissues. The activity of CA-ATP was detected to be at its highest in the tegument and subtegument.

371. Zhang, X.Y., Chen, J.P., Liu, M.F. Kuang, Q.H., Kong, F.J., Xiong, J., Zhou, R.T., Liu, G.L., Zhong, R.X., Weng, Y.Q., Zhu, D. & Zhong, H.L. Evaluation of Clonorchis sinensis antigens in the immunodiagnosis of human clonorchiasis by ELISA. Chinese Journal of Parasitic Disease Control, 1(1): 25-28 (In Chinese, with English abstract)

Proteins of Clonorchis sinensis were separated into four fractions by physicochemical methods. These fractions as well as one crude antigen were separately tested in the enzyme-linked immunosorbent assay (ELISA). The four purified antigens (i.e. A, B, C and D) were compared for their capacity to detect the presence of corresponding antibodies in the sera of proven clonorchiasis cases. The study showed that the positive rates obtained with the above-mentioned antigens were as follows: 87.5% (antigen A), 85.4% (antigen B), 72.9% (antigen C), 60.4% (antigen D) and 68.8% (crude antigen). The ratios for the optical density (OD) values of clonorchiasis patients to normal individuals were: 6.017 ± 0.579 (antigen A), 5.314 ± 0.553 (antigen B), 5.499 ± 0.603 (antigen C), 3.440 ± 0.319 (antigen D) and 3.602 ± 0.396 (crude antigen), showing a statistically significant difference with, in particular, purified antigen A proving to be far better than crude antigen.

372. Xu, L.Q., Jiang, Z.X., Chang, Z.S., Yu, S.H., Xu, F.N., Luo, J.P., Miao, Y.L., Tang, M., Zhang, X.L. & Chen, Y.X. Preliminary observations on praziquantel in the treatment of Echinochasmus perfoliatus and Metagonimus yokogawai infections. Chinese Journal of Internal Medicine, 1988, 27(7): 399-401 (In Chinese, with English abstract)

Praziquantel in a single dose of 25 mg/kg body weight, was used to treat 6 cases of infection with Echinochasmus perfoliatus and 3 cases of mixed infection with E. perfoliatus and Metagonimus yokogawai found in Fanchang County, Anhui Province. At 72 hours after treatment, worms of E. perfoliatus were expelled by 3 of the 6 patients with single infections while, at 24 hours after treatment, worms of E. perfoliatus and M. yokogawai were detected in the stools of all 3 patients with mixed infections.

Histologically, degenerative changes of varying degrees were seen in the worm tegument and reproductive system under light microscopy.

At 7-10 days and at one month after treatment, no trematode eggs were found in the stools of the treated cases. Praziquantel proved to be highly effective, with mild side effects, in the treatment of echinostomes and heterophyids.

373. Cheng, Y.Z. & Fang, Y.Y. The discovery of Melanoides tuberculata as the first intermediate host of Echinochasmus japonicus. Chinese Journal of Parasitology and Parasitic Diseases, 1989, 2(1): 47-48 (In Chinese, with English abstract)

This paper reports the discovery of cercariae, similar to those of Echinostomatidae, in Melanoides tuberculata in Yunxiao and Zhaoan Counties of Fujian. Encysted metacercariae were found in the gills of fresh-water fish after experimental infection with the cercariae for 3 to 4 hours. Adult worms identified as Echinochasmus japonicus were obtained from Mesocricetus auratus. Melanoides tuberculata was recorded for the first time as the first intermediate host of E. japonicus and its natural infection rate was found to be 1.1%. The morphological characteristics of the cercaria are described.

374. Fan, S.Q. & Sun, M.F. A case of Echinostoma hortense infection found in a human being for the first time in China. Journal of Harbin Medical University, 1989, 23(3): 161-163 (In Chinese, with English abstract)

Fasciolopsis buski-like eggs were found in the stool of an adult peasant in an outpatient clinic. The patient had been suffering from dizziness, asthenia and gastrointestinal disturbances, such as anorexia, abdominal pain and diarrhoea, for about three weeks. The blood picture showed anaemia with a haemoglobin level of 7.5 g/l, and a high peripheral eosinophil count of 13%. A history of eating raw loaches one week before the beginning of the symptoms led to a suspicion of Echinostoma infection. After treatment with levamisole in a single dose of 150 mg, a Chinese herb containing mainly Agrimonia in a single dose of 1.6 grams and magnesium sulfate as a purgative, 70 trematodes, 4.04 (2.05-7.25) x 0.92 (0.55-1.34) mm in size, and eight Ascaris were found in the patient's stool. The trematodes were identified as Echinostoma hortense.

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