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□ **Brief Communication** □

Detection of *Paragonimus*-specific IgG antibody in CSF and pleural effusion by micro-ELISA

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The frequency of central nervous system (= CNS) involvement by *Paragonimus westermani* is estimated to be 0.9% of active infection (Oh, 1969). It implies that all of CNS lesions in paragonimiasis (=PGM) patients are not necessarily due to *Paragonimus*. Therefore, to establish the nature of CNS lesions in PGM patients, definite detection of *Paragonimus*-specific IgG antibody in cerebrospinal fluid (=CSF) is essential and desirable. In this respect, Chung *et al.* (1956) determined *Paragonimus* antibody level in CSF of cerebral PGM cases by complement fixation test. Of 24 cases examined 20 proved to be CF antibody positive. And in countries where PGM is prevalent, differential etiologic diagnosis of pleural effusion is frequently necessary, using pleural fluid.

In previous report, we applied enzyme-linked immunosorbent assay (=micro-ELISA) in serodiagnosis of human PGM (Cho *et al.*, 1981), which showed high sensitivity and specificity. In this short communication, we describe our experiences on the application of micro-ELISA in the serodiagnostic trials using CSFs and pleural effusion from the cases of PGM.

The first case (Fig. 1) was referred from Hanyang University Hospital on July, 1982. The case was surgically diagnosed as cerebral and spinal PGM. *Paragonimus* eggs were found in his sputum as well. The serum and CSF were tested for *Paragonimus* antibody by micro-ELISA as described by Cho *et al.* (1981), *i.e.*, patient's serum was tested in 1:100 dilution; CSF was tested in undiluted, 1:25, 1:50 and 1:100 dilutions, respectively. The absorbance of micro-ELISA reaction product read at 492nm

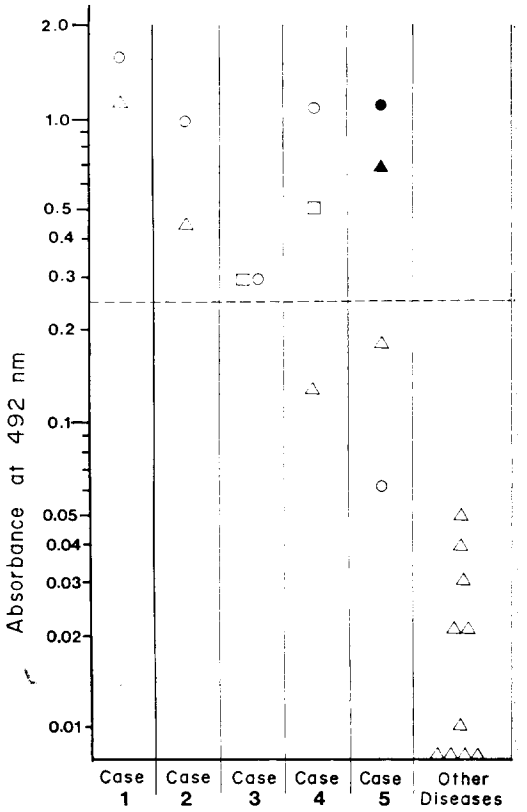

Fig. 1. Results of micro-ELISA using CSF and pleural effusion for specific IgG antibody (=AB). ○ : *Paragonimus*(=PW)-specific IgG AB in 1:100 diluted serum, △ : PW-specific IgG AB in undiluted CSF, □ : PW-specific IgG AB in 1:100 diluted pleural effusion, ● : *Sparganum*-specific IgG AB in 1:100 diluted serum, ▲ : *Sparganum*-specific IgG AB in undiluted CSF. See text for clinical summary of cases. Horizontal dotted line at 0.25 is the differential criterion for positive reaction.

was 1.58 with serum (criterion of positive reaction, 0.25), and 1.15, 0.35, 0.24 and 0.17 with CSF, respectively. These results indicated that *Paragonimus*-specific IgG antibody level was sufficiently high in cerebral PGM case when undiluted CSF was tested.

Following this initial test, 10 undiluted CSF samples from 3 tuberculous meningitis, 1 bacterial meningitis, 1 sepsis, 1 subarachnoid hemorrhage, 1 cerebral thrombosis, 1 myasthenia gravis, 1 convulsion and 1 hypocalcemic cases which were provided by Seoul National University Hospital (=SNUH) were tested by micro-ELISA. The absorbance of all tested CSFs were lower than 0.05 (Fig. 1). Thereafter, we examined 3 CSF and 2 pleural effusion samples from clinically suspected PGM cases. Their short clinical history and micro-ELISA results were as follows.

Case 2 was a pulmonary PGM patient with cerebral lesion detected by skull X-ray and CT (referred from Soonchunhyang Hospital in Seoul on April, 1983). The absorbance of 1:100 diluted serum was 0.99 and of undiluted CSF was 0.43. Case 3 was a pulmonary PGM patient with pleural effusion (from SNUH on July, 1982). Both 1:100 diluted serum and 1:100 diluted pleural effusion showed absorbance of 0.28. Case 4 was a pulmonary and subcutaneous PGM patient with pleural effusion, (from SNUH on June, 1983), and skull X-ray and CT revealed no lesion. Both 1:100 diluted serum and pleural effusion showed the absorbance of 1.2 and 0.50 whereas undiluted CSF showed 0.13. Case 5 was pathologically diagnosed as spinal sparganosis (from St. Mary's Hospital, Catholic Medical College on August, 1983). When CSF and serum were tested against *Paragonimus* antigen, the absorbances were 0.18 and 0.06 respectively. However, when tested to *Sparganum* antigen by micro-ELISA, the absorbances were 0.70 with undiluted CSF and 1.12 with 1:100 diluted serum. The clinical details of above listed cases may be published in separate reports.

These data established fairly well that the positive criterion of absorbance of 0.25 in micro-ELISA (Cho *et al.*, 1981) could also be applied for the tests with undiluted CSF and 1:100 diluted pleural effusion as well as 1:100 diluted sera. By this criterion, two cases of CNS paragonimiasis showed higher CSF level of specific antibody whereas a case of spinal sparganosis and a PGM case without CNS lesion showed lower level. So far, the determination of *Paragonimus*-specific IgG antibody in CSF by micro-ELISA is very much helpful in differential etiologic diagnosis of CNS lesions; pleural effusion was also useful material for diagnosis of PGM as valuable as patients' sera. Micro-ELISA appears to be sufficiently sensitive serologic method in detecting specific antibody in CSF.

The higher level of specific IgG antibody in CSF in CNS paragonimiasis cases is considered as a result of antibody permeation to CSF from the local granulomatous CNS lesion which contains many lymphocytes and plasma cells (Chung, 1971) rather than the permeation of antibody from blood through blood-brain barrier.

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=우리말 요약=

면역효소진단법에 의한 뇌척수액 및 흉막삼출액에서의 폐흡충 특이 IgG항체 검출

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폐흡충 감염자에서 나타나는 중추신경계의 병변을 모두 폐흡충이 중추신경계를 침범하여 발생한 것이라고는 할 수 없다. 그러므로 이 경우 원인진단을 위해서는 뇌척수액에 나타나는 폐흡충 특이항체의 측정이 필요하다고 생각된다.

우리는 확인된 뇌폐흡충증 2례와 척수 스파르가눔증 1례, 뇌병변이 없는 폐흡충증 환자 1례와, 기타 중추신경계 질환 환자 10례에서 얻은 뇌척수액을 희석하지 않고 면역효소진단법으로 특이항체를 측정하였다. 그 결과 흡광도 0.25를 양성 기준으로 하면 뇌 폐흡충증을 진단할 수 있다고 생각하게 되었다.

폐흡충증 환자 2례의 흉막삼출액에서 특이 IgG 항체가는 혈청에서의 측정치와 다르지 않아, 흉막삼출액도 폐흡충증의 진단에 이용할 수 있다고 생각되었다.