Letter to the Editor

Counterelectrophoresis on Human Serum in Coxsackie Virus Infections

Encouraging results have been obtained by Schmidt et al (1968; 1973) on the diagnosis of Coxsackie infections using gel diffusion for demonstration of antibody in patients' sera.

They found that with concentrated Coxsackie antigens human serum produced a group line close to the antigen cup with antigens not necessarily of the infecting virus type, and a specific line, closer to the serum cup, consisting of IgM antibody combined with intact virus particles, of the current infecting virus type, or occasionally with virus for which the serum had a high neutralizing antibody level.

When antigen was inactivated by heating at 56°C for 30 min the specific antigen was converted to group antigen.

Counterelectrophoresis should theoretically enable a less concentrated antigen to be used and be more rapid than simple gel diffusion, but preliminary studies have proved disappointing.

Counterelectrophoresis and antigen preparation were as described (Mac-William and Cook, 1975). Antigens were normally used at 50 to 100 times the concentration of the original tissue culture fluid, but as the antigens were unstandardized, effective concentrations were not comparable.

Using this method, the results resembled those described for simple gel diffusion in some respects. Some sera produced double precipitation lines, and the majority produced single lines against one or more of the antigens tested. Double lines occurred with sera which by neutralization had high titres or significant rises between the acute and convalescent phase sera against the appropriate antigens.

By careful placing of the holes, it could be shown in six pairs of sera tested that fusion occurred between the line nearest to the antigen cup in a serum with double precipitation lines and the single line in a serum with only one precipitation line, suggesting that these were group lines.

When antigen was inactivated one line only was produced.

However, results using different batches of antigen were not always reproducible, and three sera fractionated on sucrose density gradients showed two precipitation lines in the IgG fraction.

One reason for the discrepancies could be unsuitable relative concentrations of antigen and antibody, a well-known hazard of counterelectrophoresis, and titration of antigen and antibody supported this. In addition, one batch of Coxsackie B type antigens 260 times the concentration of original tissue culture fluid produced no precipitation lines at all when inactivated although double and single lines were produced by uninactive signalling antigen, suggesting that the inactive antigen was too concentrated to react.

However, apart from concentration there may well be other problems, and more work on technique and interpretation is needed. Further sucrose density gradients would need to be done, and should these confirm the presence of double precipitation lines in the IgG fraction, the origin of at least some of these lines must be different from those described by Schmidt et al (1968).

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KATHLEEN M. MACWILLIAM AND KAREN M. COOK
Virology Department,
St Mary's Hospital Medical School,
London W2

References


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