European Group for Rapid Laboratory Viral Diagnosis.
Amsterdam Symposium on Rapid Diagnosis

The European Group for Rapid Laboratory Viral Diagnosis held its first Symposium on Rapid Virus Diagnosis on 6 September 1977 in Amsterdam as part of the XVIth Symposium of the ‘European Association Against Virus Diseases’. The Symposium was divided into three sections: (a) rapid diagnosis by immunofluorescence, (b) rapid detection of virus by electron microscopy and other methods, and (c) rapid serological diagnosis by detection of specific IgM.

(a) In the first section on rapid virus diagnosis by immunofluorescence, respiratory viruses with special reference to influenza A and R.S. virus, herpesvirus hominis and cytomegalovirus as genital infections, herpesvirus and varicella as skin lesions and herpesvirus hominis in encephalitis were considered.

A comparison of immunofluorescent techniques and conventional isolation methods was made for influenza A and R.S. virus in the context of the overall problem of these infections in both urban and rural communities. As exemplified by R.S. virus, co-positivity was 98.9%, co-negativity 97.1% and overall agreement 97.7% for the two techniques. Similar results were obtained with influenza A and influenza B. Three hours was the usual time for rapid diagnosis to be made from receipt of the specimen in the laboratory. Application of rapid diagnostic techniques was considered in relationship to nosocomial infections, the immunosuppressed patient, unusual clinical presentation of respiratory virus infection, examination of specimens at a distance from a laboratory and the epidemiological advantages of easy laboratory techniques which were capable of handling large numbers of specimens.

The successful use of the indirect immunofluorescent technique for the diagnosis of venereal herpesvirus hominis infections as well as cutaneous herpesvirus infections was described. The same technique was useful in screening of gravid patients for herpesvirus infections. In vitro models of explant cultures were used for the investigation of both herpesvirus hominis and cytomegalovirus infections.

The concept of routine skin biopsies was introduced as a rapid method for the diagnosis of herpesvirus hominis and varicella zoster; answers were available within four hours. The lack of non-specific reactions was an obvious advantage over the conventional skin scrapings as well as demonstration of virus even in the earliest of lesions.

Brain biopsy was the only satisfactory method for the diagnosis of herpes encephalitis and because of the potential of antiviral agents, diagnosis should be treated as a virological emergency. Impression smears of brain stained by immunofluorescence was the method of choice. As yet there was no evidence for the value of examining cells of cerebro-spinal fluid for virus.

A fluorescent antibody technique which might be useful for the specific typing of adenoviruses was considered during the discussion.

Among those taking part in this section were: P. S. Gardner, M. Grandien, M. Johansson, P. Leinikki, M. Longson and E. Olding-Stenkvist.

(b) The second section was concerned with the use of electron microscopy and immune electron microscopy; it was introduced by a review of the whole subject which included the basic principles of diagnosing virus particles in faeces by both direct electron microscopy
and immune electron microscopy. The morphology of the many different types of virus particles found in faeces was considered as well as many of the artefacts.

The use of electron microscopy for the detection of rotaviruses was fully considered and its sensitivity compared with other methods such as – seroconversion, immunoelectrophoresis and fluorescent antibody techniques applied to single cycle cell cultures. Electron microscopy compared very favourably with other methods and the use of immune-electron microscopy did not appear to increase the sensitivity of the ordinary direct method.

A report was given on the identification of hepatitis A virus particles in the stools of three patients by electron microscopy. It described how these particles were confirmed as hepatitis A by immunoelectron microscopy and radioimmunoassay.

This section was concluded with a description of the use of standard immune immunoglobulin to screen faecal suspensions for rotaviruses. Other virus particles present in faeces on occasions could be identified by typing them by immunoelectron microscopy with specific antisera. Results were confirmed by neutralization tests.

Among speakers taking part in this section were: J. D. Almeida, L. Berthiaume, B. Flehmig and I. Ørstavik.

(c) The third section covered the detection of IgM in various virus infections. It was opened by a full description of the solid phase, radioimmunoassay in which virus was adsorbed on to polystyrene beads. By this method, specific IgM antibodies against rubella, measles, herpesvirus hominis, mumps, R.S. and tickborne encephalitis viruses could be readily detected. The main advantage of the technique was its simplicity once specific radiolabelled antihuman sera were available but the disadvantages included limited storage life of labelled antibody and false positive reactions caused by the rheumatoid factors.

Immunofluorescence too, provided a successful method for the detection of IgM antibodies against EB virus, cytomegalovirus and varicella/zoster virus. After many years experience it was found that negative results were obtained with insufficient virus structural antigen in test cells, slow penetration of the large IgM molecules into inadequately fixed cells and the blocking effect of high IgG antibody titres. False positives might be obtained when sera contained the rheumatoid factors or very high total concentration of IgM.

A second paper described the use of immunofluorescence for detecting specific IgM in cytomegalovirus infections. The problems of high IgG antibody titres and rheumatoid factors were also emphasized.

A third method, that of Elisa, was fully described for the identification of specific IgM antibodies in influenza and rubella infections.

This section was concluded with a description of a co-operative trial amongst a number of widely separated laboratories in different countries using different methods to determine IgM to cytomegalovirus. Titres differed widely though, if results were recorded solely as positive or negative for IgM, between 90 and 100% agreement was reached.

Among those taking part in this section were: P. Halonen, A. C. Hekker, U. Krech, H. Schmitz and J. I. Suni.

The Chairman of the European Group for Rapid Laboratory Viral Diagnosis brought the Symposium to an end by summarizing some of the aims of the Group which were:

To disseminate all the latest advances in rapid diagnosis to interested virologists, to further rapid virus diagnostic procedures for clinical purposes, to organize symposia on the subject, to arrange training courses in the subject, to ensure that reagents used in rapid techniques have been subjected to rigorous quality control, and to liaise closely with other interested organizations.
One can conclude from the enthusiasm of the speakers and from the interest of the audience that the symposium had been a success, the only defect being lack of time to do full justice to this wide and fast expanding subject.

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