MUMPS OUTBREAK IN HOSTEL

Pages with reference to book, From 281 To 282

Humayun Asghar, Syed Sohail Zaidi, Abdul Ghafoor, Farzal Anwer (Public Health Division, National Institute of Health, Islamabad.)

Mumps occur mainly in childhood when it produces acute and painful inflammatory swelling of one or more salivary glands mainly the parotid gland[1]. The mumps virus is a member of the paramyxovirus sub-group which encompasses the parainfluenza virus and Newcastle disease virus[2]. Transmission of mumps virus takes place via airborne droplet particles, fomites or direct contact and enters through the nose or mouth, The peak infectiousness of mumps occurs about 48 hours prior to the onset of overt clinical illness[3].

CASE REPORT

In December, 1991, the National Institute of Health (NIH), Islamabad was notified of parotid swellings appearing in students of Barani College hostel, Rawalpindi. Three students aged between 19-24 years developed swelling of either one or both parotids. Swellings were of rapid onset, painful, red and hot. One of the students had fever of 38-40°C. The swelling reached their maximum size between 2-3 days and then subsided within 7-10 days. There were no clinical signs of orchitis, polyarthritis, pancreatitis or any sign of involvement of the central nervous system during the course of the disease. For virus isolation, specimens were collected from 3 individuals by swabbing the area around the orifice of Stenson's duct after 36-48 hours of the onset of swelling. Swabs were placed immediately into glass vials containing 2-3 ml of viral transport media (veal infusion broth with antibiotics). Glass vials were placed on ice packs and transported at 4°C to the Virology Department, NIH, Islamabad for further processing. Samples of venous blood were collected for serology. All three specimens of swabs taken from Stenson's duct were inoculated into tubes of MDCK, Hela and Rhesus Primary Monkey Kidney (PMK) cell lines. Cultures were then maintained in medium containing Minimum Essential Medium (MEM), 2% foetal calf serum, 100 units of penicilline and 100 ugm of streptomycine per ml. The inoculated tubes, together with the control tubes were incubated at 36°C and were examined daily for cytopathic effect (CPE) for 7 days. Medium was replaced when required to maintain the cells in healthy condition. No CPE was seen in any of the cell line, however, Haemadsorption (HAd) test was positive on MDCK cell line in one sample after 7 days. The other two negative samples were given passage but no CPE or HAd test positive after 14 days of inoculation. Haemadsorption inhibition (HAdI) test was performed to confirm the presence of the mumps virus. HAdI test done as described by Hope E. Hopps and Paul D. Parkman using antimumps serum[4]. Antimumps serum from the Standard Laboratory, Central Public Health Laboratory, London was used in final dilution of 1:400. Acute phase sera were tested by ELISA technique for IgM antibodies.Mumps virus was isolated from one of the three samples. One sample was HAd positive and was confirmed by HAdI test. Acute phase sera were tested for specific 1gM antibodies by ELISA technique. Sera of all 3 clinically diagnosed paties were positive for specific IgM antibodies, while 16/52 (30.7%) sera of students living in the same hostel but having no sign or symptom i.e., susceptible contacts, were found to be positive for specific 1gM antibodies. A total of 19/55 (34.5%) sera were found positive for specific 1gM antibodies against mumps virus.

DISCUSSION

Mumps outbreak occurs where crowding favours dissemination of the virus[5]. Places like schools, colleges and work places to close contact by droplets from respiratory secretions. Outbreaks occurring in high schools and in college campuses reflect a change in the epidemiology of mumps and shift in risk from the elementary school aged child to the adolescent and young adults age group[7,8]. Available data suggests that the increase in mumps activity is the result of illness among unvaccinated middle and high school students[9,10]. Historically, mumps prevention has received less attention than other vaccine-preventable diseases because the illness is perceived as being mild[6]. The evidence of subclinical infection in 16 of 52 (30.7%) susceptable contacts signifies the possible rapid transmission of disease to other unvaccinated or non-immune persons (who did not have previous subclinical infection). There is evidence of occurrence of disease in household contacts subsequent to the illness of employees[6] of a workplace and 30.7% of asymptomatic cases in our study signifies the importance of isolation to minimise the spread of the virus during an outbreak. Keeping in view the infrequent manifestation of illnesses complications like orchitis, oophoritis, encephalitis and pancreatitis and risk of spread of virus to susceptable contacts it seems essential that immunization with live attenuated mumps virus vaccine is useful and practical to reduce the incidence of morbidity and mortality of mumps virus infection. A single dose of vaccine given subcutaneously produces protective level of mumps neutralizing antibodies in more than 95% of vaccine[12] and antibodies persist at least 10 years[13]. It has been investigated during an outbreak of mumps in a high school that mumps vaccination during an outbreak of mumps may contribute to the termination of the outbreak[11]. The specific 1gM antibodies against mumps virus were positive in all 3 (100%) clinically diagnosed patients by indirect ELISA technique confirmed the recent mumps infection. Sera of 16 of 52 (30.7%) susceptable contacts were also found positive for specific 1gM antibodies against mumps virus infection. These observations suggest that the detection of the specific IgM antibodies is very helpful for an early diagnosis of mumps infection and it has advantage that heterotypic antibodies induced by parainfluenza virus infection do not cross-react in mumps IgM ELISA[13]. The isolation of mumps virus takes quite long (7-14 days) and some times typical CPE is not observed as it occurred during our study. Variability of time of excretion of mumps virus from different sites during illness and some times only extrasalivary gland manifestations of the diseases'3 makes it difficult to isolate the virus and delays the diagnosis. Since the detection of an early mumps infection may help the physician to give symptomatic and supportive treatment to the patient and may also contribute to limit the spread of infection, we suggest the utilization ofELISA technique for rapid diagnosis of mumps infection.

REFERENCES

1. Duerden, B, I., Reid, T.M.S., Jewsbury, J.M. and Truf, D.C. A short textbook microbial and parasitic infection. UK first published, 1987, p. 126.
2. Fenner, F. The classification and nomenclature ofviruses. Intervirology, 1976;7:59.
3. Brunwell, P.A., Brickman, A., O'Hare, D. and Steinberg, S. ineffectiveness of isolation of patients as a method of preventing the spread of mumps. N.Engl.J.Med., 19688:279:1357-61.
4. Hopps, HE. and Parkman, PD. Diagnostic procedures for viral, rickettsial snd chiamydia infections. Editors: HE. Lennett and J.N. Schmidt. 5th ed. New York, American Public Health Association, 1979, p. 642.
5. Philip, R.N., Reinhard, HR. sod Lackman, D.B. Observations on a mumps epidemic in a "virgin" population. Am.J.Hyg. 1959;69:91- 111.
6. Kaplan, K.M., Marder, D.C., Cochi, S.L. and Preblud, S.R. Mumps in the workplace. JAMA.,1988;266:1434-3&
7. Beard, C.M., Benson, R.C. Jr., Kelalis, P.P., Elveback, L.R. and Kurland, L.T. The incidence and

outcome of mumps orchitis in Rochester. Minnesota, 1935 to 1974. Mayo Clin. Proc., 1977;52:3-7.
8. Cochi, S.L. Preblud, SR. and Orenstein, WA. Perspectives on the relative resurgence of mumps in the United States. Am.J.Dis.Child., 1988;142:499-507.
9. Centre for Disease Control, Mumps-United States, 1985-86. MMWR., 1987;36:151-55.
10. Cochi, S.L and Preblud, SR. Current status of mumps in the United States, in proceedings of the 21st immunization conference. New Orleans, Louisiana: 21st immunization conference, 1987.
11. Wharton, M., Bistewish, J.M., Hutcheson, R.H. and Schaffner, W. Mumps in a high school - Tennessee (abstract). Atlanta, Georgia: Epidemic intelligence Service 36th Annual Conference, CDC, 1987.
12. Buyank, E.B. and Hilleman, M.R. Live attenuated mumps virus vaccine I. Vaccine developmenL Proc. Soc. Exp. Biol. Med., 1966:123:768-75.
13. Jawetz, F.., Melnick, J.L., Adelberg. E.A>, Brook, G.F., Butel., i_S. and Ornston, LN. Medical microbiology. 18th edn. London, Prentice-Hall, 1989, pp. 488-89.