Measles Virus

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Molecular surveillance of Measles and subacutesclerosing panencephalitis (SSPE) in India from 2003

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Molecular surveillance for measles continued this year expanding into new geographic areas to analyze the measles genotypes circulating in the area. We report the circulation of Measles Genotype D4 (1), D7 (1) and D8 (9) in Tamil Nadu and Maharashtra. This year we have detected first case of genotype D7 in Tamil Nadu, India, adding to genetic diversity of measles in India.

Tamil Nadu (2002-05)

Chennai-2002

Three Sera and 5 Throat Swab (TS) from 5 sporadic measles cases were collected. Attempt for virus isolation was carried out using Vero, B95a cell lines. Two samples showed IgM positivity whereas 1 TS gives virus isolation. Five throat swabs and one throat swab isolate were subjected to RT-PCR. All samples found positive for MV RNA using N gene primer set. Out of these PCR products, two were subjected to sequencing. Phylogenetic analysis reveals Measles Genotype D4 and D8. This is first study of measles genotypes from South India. Kings Institute of Preventive Medicine, Chennai investigated classical measles outbreaks in Virudhnagar, Perambalur, Tiruvallur and Chennai districts of Tamil Nadu. Five isolates grown in B95a were referred to NIV (3 urine and 2 TS) for molecular studies. These five isolates were re-grown in B95a cell line, and subjected to RT-PCR and sequencing. Phylogenetic analysis shows presence of measles Genotype D8 and D7.

Measles genotype D7 was retrospectively detected from an outbreak involving an orphanage, which was investigated by KIPM, Chennai. D7 was detected from one isolate from 11-year male child. As D7 is mainly reported from European country, there is likely possibility of genotype D7 importation from Europe. This could not be ascertained with epidemiological investigations. Chennai D7 strain is 99% identical to UK 2003 strain (ELSM net). Future molecular detection of measles virus from other areas may limelight whether this genotype is endemic in this area or it is an imported strain. An abstract of paper based on this work has been accepted for presentation at International Virology Conference, USA, 2005.

Continuing measles surveillance in Tamil Nadu, measles outbreak in Cadlore district of TN was investigated by National Institute of Epidemiology, Chennai. Total 101 measles cases were reported up to January 2005. Amongst these 51% were above 5 years of age. In this area vaccine coverage is 67% (as per Immunisation cards). Total 8 Sera and 5 TS were collected by NIE Chennai and referred to NIV for further virological work. Out of these 5

were IgM positive by ELISA. RT-PCR and sequencing was performed on 2 TS collected from patients. Phylogenetic analysis revealed circulation of measles genotype D8 in this outbreak.(Fig.1)

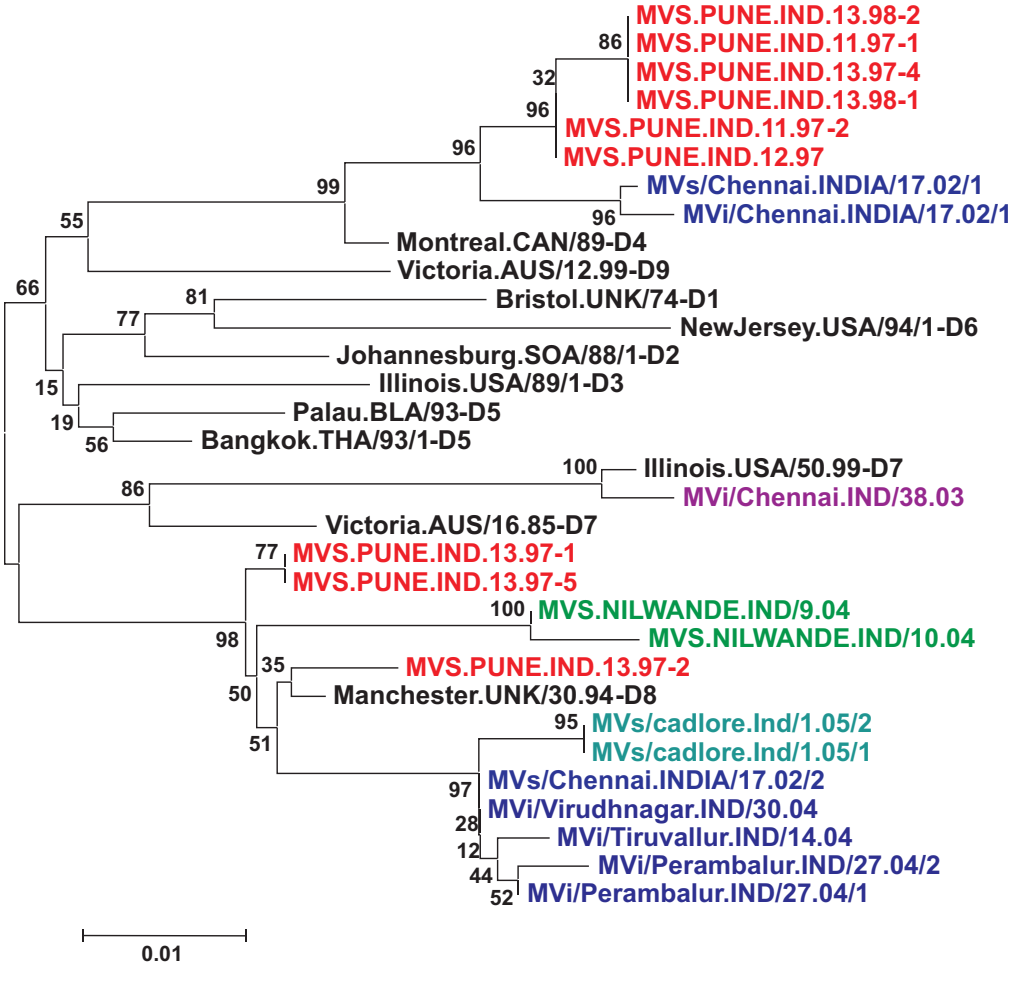

Figure 1. Measles Genotype D based Phylogentic tree

Measles Outbreak Investigations, Uttaranchal

Measles outbreak in Nai, a remote village in the hilly area of Uttaranchal was investigated by FETP student of NIE, Chennai. Eighty-six cases were reported from this outbreak in below 14-year age group from October to November. One case of measles was 23-year-old pregnant woman with classical fever and maculopapular rash. Immunisation coverage was poor in the area. 58% of measles cases were unimmunised. Case fatality rate was 2.32%. Blood and Throat swabs were referred to NIV for further investigations. 13 Sera and 8 Throat swabs from cases and 3 sera from mothers of cases were received. IgM ELISA for measles indicated seropositivity in 10 of 13 sera from cases. None from contacts were positive. Attempt was made for detection of Measles RNA in PBMC's purified from 2 suspected measles cases. RNA was extracted from PBMCs and RT-PCR for amplification of N gene of Measles virus was setup. All the samples were PCR negative. Further work is going on. Specimens from 8 suspected measles cases were refered to NIV by Pediatrician at Bijnore, UP. Two of 8 sera were positive for IgM antibodies. Other samples (15 TS, 5 saliva, 28 urine samples) are being processed for virus isolation and further studies.

Investigation of outbreak in Satara District

A small measles outbreak was reported from PHC Masur of Satara district. Total 12 cases of measles were reported. The age group involved was from 6 years to 16 years. Only one case was found to have received measles vaccine. The measles vaccine coverage in the PHC is above 80%. Serological studies show measles IgM positivity in 7 of 12 cases. One encephalitis case, 14 years female, was reported during the same period and was investigated in district hospital. She had fever, rash and cough for 6-7 days, convulsions and unconsciousness since 3 days. There was anuria for 8 hours. Pneumonia was another complication in this patient. At the time of sample collection, maculopapular rash was observed on extremities. This female patient had measles exposure from her sibling and was not vaccinated. Patient expired after 3 days of hospitalization. Serum sample of this patient had IgM antibodies to measles. Further virological work is in progress.

WHO Measles Aerosol Vaccine Project

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Edmonston Zagreb Measles Vaccine would be given by Aerosol route by using special aerosol devices. The first phase trial of measles vaccine will start at three centers in Pune, Kolkatta and Chennai. National Institute of Virology is the Central Measles Reference Laboratory for this project. Plaque reduction neutralization test (PRNT) will be done at National Institute of Virology , which is standardized using vero cells. The titer will be expressed in mIU/ml . Measles PRNT on Quality Assurance samples sent by HPA, London was performed. The results correlated well (100%). Measles PRNT was also done on coded serum samples and International standard serum sent by National Institute of Biological standards and control (NIBSC) UK.