

# Foot and mouth disease - a global crisis

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**F**oot and Mouth Disease (FMD) is endemic in India. Every year several outbreaks occur in various parts of the country. In Kerala we experienced severe outbreak during 1998-99 and in sporadic form during the past year. Now, severe outbreaks occur in Punjab, Haryana and part of Uttar Pradesh. Similar outbreaks were also reported from UK during January-February 2001 and they considered India to be the source of infection.

FMD control is a difficult task due to many factors. Some of the important factors are multiple hosts, wild reservoirs, virus plurality and severe antigenic variation, poor immunogenicity of FMD viruses, lack of disease surveillance and diagnosis aggravate the situation. Moreover insufficient typing facilities result in lack of updating vaccine

strains, insufficient vaccine production, lack of infrastructure for vaccine storage and lack of assessment of sero conversion.

Countries like Australia, Japan, New Zealand and till recently UK were able to keep away FMD especially due to their peculiar geographical location and "stamping out" policy. European countries are also following slaughter policy to reduce the incidence of FMD. So

far they have been successful in their effort. In our country we cannot adopt slaughter policy due to various socio-economic and political reasons. We are also facing difficulty in implementing strict rules and regulations for FMD control. Systematic large-scale vaccination programme is the most appropriate method to bring down the incidence of FMD in our country. Since vaccination policy is the best choice, the most effective vaccine must be available. Now, India is one of the biggest FMD vaccine producers in the world. But the production is only 1/10<sup>th</sup> of our requirement. Even the present production is not being fully utilized in India. It means that our vaccination coverage is not adequate. For the effective control more than 80% of the susceptible population must be immunized at regular interval.

Usually farmers are reluctant to get their animals immunized when there is no outbreak. But during outbreak they are ready for vaccination. So we must exploit these occasions for immunizing the major section of livestock. So that a primed population can be maintained, which in turn produces high titre, when vaccination is done during an outbreak.

Our vaccine manufacturers have launched oil adjuvant FMD vaccines in India. Indian Veterinary Research Institute, M/s Indian Immunologicals and M/s Akzo-Nobel (Intervet) have their own oil adjuvant FMD vaccine. Since oil adjuvant vaccine provides long duration of immunity in all species of animals including pigs, we must switch over to use of oil adjuvant vaccines.

Till recently we were using formaldehyde inactivated vaccines but now we have more effective Binary-ethylene amine inactivated mineral oil adjuvant vaccine, which provides longer periods of immunity. These inactivated vaccines will not be in a position to produce as much durable immunity as live vaccines. So attempts are being made in various laboratories to produce de-

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lete mutant FMD vaccine. Here the genes responsible for virulence or pathogenicity is removed and used as live FMD vaccine.

It is high time to think about the use of combined vaccines for cattle in India. Various studies have shown that FMD antigen can be combined with HS, BQ, Rabies, Clostridial antigen, Anthrax, Rinderpest and Hog Cholera. FMD and the commonly occurring livestock diseases can be prevented by use of combined vaccine and by repeating at an interval of 9-12 months. This will reduce the cost of vaccine and labour. M/s Indian Immunologicals have already come out with a vaccine containing FMD, HS and BQ and FMD and HS in oil adjuvant form. The seroconversion studies of these vaccines are being carried out in the department of Veterinary Epidemiology and Preventive Medicine, Kerala Agricultural University, Mannuthy.

Typing of field virus has to be done at random from each outbreak for updating the vaccine seed virus. The tissue of choice for typing is tongue epithelium. Ideally at least 1 g of tissue from an unruptured or recently ruptured vesicle should be collected. Vesicular fluid is having the highest concentration of virus and can be collected for this purpose. These tissues and fluids should be placed in a transport medium comprised of equal amount of glycerol and 0.04 M phosphate buffer with a pH of 7.2-7.6 preferably with added antibiotics. Phosphate Buffered Saline (PBS) can also be used instead of 0.04 M Phosphate Buffer. Samples should be refrigerated or frozen immediately after collection. The container should be tightly closed and labelled. It should be sent to the laboratory at the earliest in dry ice packing or in flask with ice.

Other than vaccination we have to observe certain points during an outbreak to prevent further spread of the virus from that point. Animal movement has to be checked. No animal should be allowed to enter and leave the affected area.

The susceptible population along the border of the state, forest and cattle migratory path (at least 5-km width) must be immunized routinely to act as a check

for the transmission of FMD virus.

Pigs should be fed with only cooked hotel waste, meat scraps, abattoir waste etc. Pigs should be immunized once in 6 month with oil adjuvanted FMD vaccines, whereas in cattle it is 9-12 month interval. During an outbreak animals should not be sent outside for grazing.

FMD vaccination camps should not be conducted during an outbreak. Door to door vaccination alone should be done. Individual animals should be vaccinated using separate sterilized needles. Moreover FMD animal should not be allowed to wander outside. Cattle shows, calf rallies or any other programmes where animals assemble should be banned during an outbreak.

Inert contaminated material in the premises, should be disinfected; including human clothing, motor vehicle, farm machinery, bedding, feed, feeding utensils, animal products. Other articles that can not be disinfected must be burned. Barns and yards should be cleaned and disinfected. Formaline 2%, sodium hydroxide 2%, sodium carbonate 4% are ideal disinfectants that kill the FMD virus in few minutes. The workers should use waterproof clothing that can be disinfected easily. Milk from positive cases should be considered as infective. No meat reclamation should be allowed from slaughtered cases.

Animal and animal byproduct import from FMD endemic countries should be banned. Effective quarantine must be implemented at the path of entry. The animals should be observed for one month, after which they should be vaccinated and released three weeks after vaccination. If the animals are vaccinated, their serum must be analysed for antibody titre before release. Prevent entry of uncooked meat from ship, aircraft that are coming from endemic countries. Public must be made aware about various aspects of FMD especially epidemiology, economic loss and control measures.

