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An Outbreak of Classical Swine Fever in Indigenous Pigs in Tamilnadu, India

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Abstract Classical swine fever is a highly contagious viral disease of swine causing economic losses due to heavy mortality and reproductive problems. The present study was conducted at Nakalapuram village, Villathikulam taluk of Thoothukudi District, Tamilnadu where there was a suspected outbreak of swine fever among the indigenous pigs reared under scavenging system. Ninety pigs out of one hundred and ten pigs of all age groups without any vaccination died within two to three days period. The ailing animals showed clinical signs such as high fever, staggering gait, frothy excessive salivation, severe respiratory distress, paddling of legs with convulsions followed by death. The post mortem examination was carried out in two pigs and the histopathological examination was carried out on representative necropsy samples like liver, spleen, kidney and mesenteric lymph node. Based on the necropsy findings such as haemorrhagic lymphadenitis, petechial haemorrhages in kidney and spleen and by NS5B gene based RT-PCR the disease was confirmed as classical swine fever.
Keywords *Indigenous Pigs; PCR; Classical Swine Fever*

1. Introduction

Classical swine fever is a highly contagious viral disease of pigs caused by the genus Pestivirus belongs to the family Flaviviridae, which also includes bovine viral diarrhoea virus (BVDV) and border disease virus (BDV) (Wengler et al., 1995). Depending upon the virulence of the virus, host and environmental factors, age and breeds of the pigs the course of the disease in affected pigs may be per-acute, acute, subacute, chronic or atypical (Moennig et al., 2003). Swine fever causes heavy losses due to reproductive problems and mortality in affected pigs (Sarma et al., 2008). In India, the disease was recorded in Punjab for the first time in 1961 and subsequently from Maharashtra and Uttar Pradesh in 1962. During the past few years the outbreaks of swine fever have been recorded from the states of Nagaland, Manipur, Tripura, West Bangal and Tamilnadu (Rahman, 2011). Swine fever causes heavy losses due to reproductive problems and mortality in affected pigs (Sarma et al., 2008). The present paper describes the outbreak of classical swine fever in non-descript indigenous pigs in Tamilnadu.

2. Materials and Methods

2.1. Disease Investigation

The present study was conducted at Nakalapuram village, Villathikulam taluk of Thoothukudi District, Tamilnadu where there was a suspected outbreak of swine fever among the indigenous pigs reared under scavenging system. The detailed history of the feed and housing, number of pigs affected, mortality pattern, vaccination status and clinical findings were recorded. The post mortem examination was carried out in two pigs.

2.2. Histopathology

Pieces of tissues from liver, spleen, kidney and mesenteric lymphnode were collected and fixed in 10 per cent formal saline. The tissues were subjected for histological processing and finally embedded in paraffin. Paraffin embedded tissues were sectioned at 5 µm thickness and stained with haematoxylin and eosin (H & E) for histological examination (Bancroft and Stevens, 1996).

2.3. Polymerase Chain Reaction

The NS5B gene based reverse transcriptase-polymerase chain reaction as described by Rathnapraba et al., (2013) was carried out at the Department of Animal Biotechnology, Madras Veterinary College, Chennai from the samples of liver, spleen, kidney and mesenteric lymphnodes for confirmatory diagnosis of CSF.

3. Results and Discussion

Classical swine fever may occur in peracute, acute, subacute, and chronic forms, with the acute form occurring most commonly. In the acute form, high fever, depression, anorexia, and conjunctivitis appear 2 to 4 days post exposure, followed by vomiting, bacterial pneumonia, paresis, paralysis, tremor, and convulsions. Nearly all pigs in a unit become affected within approximately 10 days, and mortality may reach 100% (Moennig et al., 2003). Similar to this, in the present study, around ninety pigs out of one hundred and ten pigs of all age groups reared under scavenging system without any vaccination died within two to three days period. The ailing animals showed clinical signs such as high fever, staggering gait, frothy excessive salivation, severe respiratory distress, paddling of legs with convulsions followed by death.

Necropsy findings revealed petechial haemorrhages in the kidney capsule, ileocecal valve, lymphnodes, spleen and pericardial sac. Emphysema and congestion was noticed in lung. The lymphnodes such as retropharngeal and mesenteric were enlarged and haemorrhages were observed. Necrotic ulceration with haemorrhages was observed in the colon. Similar observations were reported by Murphy et al. (1999) and Ravishankar et al. (2011).

Histopathological observations made in the present study such as congestion and depletion of lymphocytes in the paracortex of lymph nodes, depletion of lymphocytes in white pulp of spleen, enlargement of kidney sinuses, haemorrhages in proximal convoluted tubule and degeneration of hepatocytes in the liver were correlated very well with the findings of Govindarajan et al. (2003) and Palanivel et al. (2012).

The reverse transcriptase-polymerase chain reaction (RT-PCR) has been proved to be specific and more sensitive technique for detection of CSF in tissues than fluorescent antibody technique, immunoperoxidase assay using monoclonal antibodies and antigen-capture enzyme-linked immunosorbent assay (Handel et al., 2004). Similar to present study, several authors (Liu et al., 1991;

Singh et al., 2005; Rathnapraba et al., 2012 & 2013) also detected CSF viral nucleic acid in tissue samples such as liver, spleen, kidney and mesenteric lymphnodes by RT-PCR. All the samples were proved to be CSF positive. This established 100 per cent relationship between the suspected tissues and the presence of virus.

Conclusion

In conclusion, based on necropsy findings and by RT- PCR, it was confirmed that the mortality among the indigenous pigs reared under scavenging system was due to swine fever. The detection of CSF in desi pigs in the state is critical to introduction of suitable prevention and control measures. However, control strategies should be planned and activated only after the prevalence of CSF in desi pigs in the state has been fully investigated.

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