Haryana Vet. (June, 2022) **61(1),** 147-148

Short Communication

A SEROLOGICAL STUDY ON PORCINE PARVOVIRUS AMONG PIGS IN CHENNAI, TAMIL NADU

LALRINKIMA, S. HEMALATHA, K. NAGARAJAN*, G. DHINAKAR RAJ[1], A. THANGAVELU[2], G.V. SUDHAKAR RAO and D. BALASUBRAMANYAM[3]
Department of Veterinary Pathology, Madras Veterinary College, Chennai,
[1]Centre for Animal Health Studies, Tamil Nadu Veterinary and Animal Sciences University, Chennai,
[2]Department of Veterinary Microbiology, Veterinary College and Research Institute, Namakkal, Tamil Nadu
[3]Veterinary College and Research Institute, Theni, Tamil Nadu

Received:15.07.2021; Accepted:17.02.2022

SUMMARY

Porcine parvovirus (PPV) infection causes significant losses to the pig industry and is considered as one of the most economically important viral disease of intensive swine production. A serological survey was conducted to determine the occurrence of PPV infection among pigs in an organised research farm with history of reproductive failure. A total of 91 pig sera were screened for antibodies against PPV by using commercial ELISA kit. Since vaccination against parvo viral disease was not adapted in the farm, the findings of this study suggest the occurrence of PPV infection among pigs.

Keywords: ELISA, PPV, seroprevelance, swine

How to cite: Lalrinkima, Hemalatha, S., Nagarajan, K., Raj, G.D., Thangavelu, A., Rao, G.V.S. and Balasubramanyam, D. (2022). A serological study on porcine parvovirus among pigs in Chennai, Tamil Nadu. *Haryana Vet.* **61(1)**: 147-148.

Porcine parvovirus (PPV) is considered as one of the major cause of reproductive failure in swine characterized by repeat estrus, abortion and delivery of stillborn fetuses. The first report of PPV in pigs was in 1967 (Cartwright and Huck, 1967), and the virus is now prevalent in most parts of the world, which is infecting all types of pig herds. The PPV infection is caused by a small non-enveloped, single stranded DNA virus which is classified under the genus *Protoparvovirus* of the family *Parvoviridae*. The epidemiological pattern of the disease is designated asendemic and epidemic infection. Parke and Burgess (1993) reported that endemic PPV infection might go unnoticed, especially if a farm fails to keep accurate records and analysis systems and if a veterinarian oversees the herd's health. In contrast, epidemic PPV infection in a susceptible herd is apparent, and the economic impact was severe. In India, the disease was reported for the first time by Sharma and Saikumar (2010) in association with reproductive failure and neonatal mortality in crossbred pigs. In South India, Aishwarya *et al.* (2016) reported first occurrence of porcine parvovirus from Kerala state, in domestic and wild pigs. Porcine respiratory and reproductive syndrome and Porcine circo virus-2 (PCV-2) infection showed similar clinical indications of reproductive problems, hence a differential diagnosis is required. The present study was carried out in an organized piggery farm unvaccinated for PPV with a history of reproductive failure to ascertain the seropositivity of porcine parvovirus infection.

Serum samples were collected from apparently healthy pigs comprising of growers and adults froma piggery unit of Tamil Nadu Veterinary and Animal Sciences University's research farm at Kattupakkam, Chennai during November 2019 to January 2020. Large White Yorkshire (LWY) and TANUVAS KPM Gold (75% LWY + 25% desi) were the breeds available in the farm. The total stock position in the pig breeding unit was 895 consisting of preweaners, weaners, growers and adults. Adults and growers in the herd were vaccinated with a live attenuated lapinized strain of classical swine fever virus (CSFV), PCV2 vaccine and Foot and Mouth disease inactivated vaccine. The farm had a herd history of abortion, still births, mummified fetus, among sows and piglet mortality soon after birth.

Approximately, 4-5 ml of blood was collected by anterior venacavaroute in piglets and from ear vein in adult pigs using sterile vacutainer tubes without EDTA and centrifuged at 1000 rpm for 5 mins, sera were separated and stored at -20 ºC assay. Sera were tested for PPV-specific antibodies using a commercially available enzyme-linked immunosorbent assay (ELISA) kit following manufacturer protocol (Elabscience). The absorbance value of each well was measured using ELISA reader at 450 nm wavelength and sera were considered positive for PPV antibodies if the optical density value of the sample to that of positive control was ^{3} 0.6. Data obtained were analyzed with Graph Pad prism version 9.0 (Graph Pad software, San Diego, USA) using Chi-square (X2) test with the level of significance determined at an alpha level of 0.05.

Porcine parvovirus (PPV) is emerging as a major threat to the swine industry worldwide and have been documented as the most common viral causes of porcine

*Corresponding author: nagavet@gmail.com

reproductive failure. The economic impact of the disease is due to the increase in repetition of heats, reduction of litter size and fertility. Hence, profitable pig production depends partly on preventing the occurrence of such infectious diseases that affect swine reproductive performance. The farm under study had a herd history of repeated abortions, still births, mummified fetus and piglet mortality soon after birth and was earlier associated with PCV2 infection (Karuppannan *et al.*, 2016) for which periodical vaccination against PCV2 was adopted thereafter. The seropositivity of PPV in the farm was assessed among growers and adults of both sexes. Out of 91 sera samples tested, the overall prevalence of PPV antibodies was 68 (74.7%) (Table 1). The high seroprevalence of PPVspecific antibodies among vaccine naïve pigs in the farm indicateda subclinical form of PPV infection. The antibodies against PPV infection were high among females (76.4%) than males (72.5%) (Table 1) and among 1–2 years adult males and females. The findings were corroborative with the results of Oravainen et al. (2005) who reported high prevalence of PPV among adult male and female pigs. Since the pigs in the farm are vaccinated against CSF and PCV2 infection and as vaccination against PPV not carried out, the prevalence of PPV antibodies among growers indicate transmission of virus from infected sows. The detection of PPV seropositivity among adult pigs and persistent history of abortion, stillbirths, mummified fetus and piglet mortality in the farm suggest possible infection of pregnant sows with PPV. Infected boars also can transmit the virus *via* semen and have been reported to constitute a potential source of transmission. The present study with detection of PPV antibodies in a herd where vaccination aginst PPV is not practiced suggest natural infection with virus and forms the basis for further molecular and immunopathological studies which is under progress. PPV is an important differential for reproductive failure in pigs and rarely reported in southern states of India and the findings in this baseline study indicates PPV as a most probable cause for abortion and piglet mortality. Proper prevention and control measures with regular screening of existing and newly purchased pigs for PPV in pig farms and vaccination can ensure PPV immunity of all breeding pigs in a herd.

Table 1

Seroprevelance of PPV antibodies in pigs

	Total stock	No. of sera tested	No. positive for PPV	P- value
Age (months/yrs)				
Growers (2-5 months)	511	60	38 (63.3 %)	0.0005
Adult (1-2 Yrs)	169	31	30 (96.7 %)	
Total	680	91	68 (74.7%)	
Sex				
Female	398	51	39 (76.4%)	0.6653
Male	282	40	29 (72.5 %)	
Total	680	91	68(74.7%)	

CONCLUSION

The findings of this study revealed 74.7% of seropositivity against PPV in an organized pig farm which forms the baseline data on the PPV infection. Further, molecular studies in semen, fetal tissues etc. are warranted to establish the circulation of PPV in pig farms which is considered to be responsible for major economic losses in the swine industry at all stages of production.

ACKNOWLEDGEMENT

The authors acknowledge Professor and Head, Department of Veterinary Pathology and Dean, Madras Veterinary College, Chennai for providing facilities for the study.

REFERENCES

Aishwarya, J., Ravishankar, C., Rajasekhar, R., Sumod, K., Bhaskar, N., Shaji, S. and Mini, M. (2016). First report of detection and molecular characterization of porcine parvovirus in domestic and wild pigs in Kerala, India. *Virus Disease.* **27(3)**: 311-314.

Cartwright, S.F. and Huck, R.A. (1967). Viruses isolated in association with herd infertility, abortions and stillbirths in pigs. *Vet. Rec.* **81**: 196-197.

Karuppannan, A.K., Ramesh, A., Reddy, Y.K., Ramesh, S., Mahaprabhu, R., Jaisree, S. and Babu, M. (2016). Emergence of porcine circovirus 2 associated reproductive failure in southern India. *Transbound. Emer. Dis*. **63(3)**: 314-320.

Oravainen, J., Heinonen, M., Tast, A., Virolainen, J.V. and Peltoniemi, O.A.T. (2005). High porcine parvovirus antibodies in sow herds: prevalence and associated factors. *Reprod. Domest. Anim.* **40(1)**: 57-61.

Parke, C.R. and Burgess, G.W. (1993). An economic assessment of porcine parvo virus vaccination. *Aus. Vet. J.* **70(5)**: 177-180.

Ritzmann, M., Wilhelm, S., Zimmermann, P., Etschmann, B., Bogner, K.H., Selbitz, H.J. and Truyen, U. (2005). Prevalence and association of porcine circovirus type 2 (PCV2), porcine parvovirus (PPV) and porcine reproductive and respiratory syndrome virus (PRRSV) in aborted fetuses, mummified fetuses, stillborn and nonviable neonatal piglets. *DTW. Deut. Tierarztl. Woch.* **112(9)**: 348-351.

Sharma, R. and Saikumar, G. (2010). Porcine parvovirus-and porcine circovirus 2-associated reproductive failure and neonatal mortality in crossbred Indian pigs. *Trop. Anim. Health Pro.* **42(3)**: 515-522.