



E-ISSN: 2320-7078

P-ISSN: 2349-6800

www.entomoljournal.com

JEZS 2021; 9(2): 509-514

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Received: 09-12-2020

Accepted: 07-02-2021

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A retrospective study on various clinical complications related to the body systems in pigs with special reference to respiratory complications in Hassan district, Karnataka state

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DOI: <https://doi.org/10.22271/j.ento.2021.v9.i2h.8524>

Abstract

A questionnaire based study on various clinical complications related to different body systems of pigs with special reference to respiratory system has been carried out in fifty different pig farms of Hassan district, Karnataka state during the period from April 2019 to March 2020. The clinical problems related to digestive system were in the highest order (96%) followed by systemic/ fever (80%), skin problems (64%). The problems related to the respiratory system like coughing, laboured breathing, nasal discharge, and dryness of snout etc. (46%), reproductive problems (38%), endoparasites (28%), urinary system (12%). The complications related to nervous system (10%) was also observed. The respiratory problems appeared at considerable levels. Further detailed analysis related to the respiratory diseases caused by the various agents along with the managerial and environmental factors is warranted for the future studies to know the major factors involved in inducing the respiratory problems in pigs of the study area.

Keywords: pig, hassan, clinical complications questionnaire, respiratory problems

Introduction

The growing global human population creates an increased demand for animal source foods. To meet this demand, pigs are one of the preferred species due to their certain inherent traits like high fecundity, better-feed conversion efficiency, early maturity and short generation interval. Accordingly, there has been a substantial increase in the volume of pig meat produced (38% of the world livestock meat consumed) in the last 20 years, often associated with intensification of production and increased movement of pigs between countries [1, 2].

Of all species, pigs are likely to constitute a greater share of the growth in the livestock subsector. Pig farming also requires small investment on buildings and equipments. It has immense potential to ensure nutritional and economic security for the weaker sections of the society. India possesses one of the largest livestock wealth in the world and a quarter of the agricultural gross domestic product is contributed by the livestock sector [3]. Among the livestock species, pig finds an important place as it being reared by socio-economically weaker sections of the society and pig rearing is one of the most important occupations of rural society especially among the tribal masses of India. It has largely remained under free range rearing with the weaker sections of the society both as a source of income and a choice of meat for consumption.

Over 70 percent of the pigs kept in India are indigenous. Pig rearing is still in the unorganized sector that requires science and technology driven support to make it a vibrant enterprise. The various stakeholders require promotion at various levels such as technology, entrepreneurship development, and financial support for Indian pig farming in attaining a place at global level. In general, the infectious diseases cause significant economic losses to the pig industry more important are the viral agents that cause respiratory diseases. The increased pressures of rearing pigs in modern-day confinement systems have the potential to overcome the robust defences of respiratory system and lead to the development of respiratory disease. In most swine-producing areas, large groups of pigs are housed under intensive conditions, often in geographical regions with a dense pig population [4].

Respiratory diseases may result when the respiratory defences are compromised by exposure to fine particulates, such as dust, and volatile chemicals, such as ammonia from animal waste. The high stocking density in a closed environment also facilitates transmission of airborne pathogens within a herd and between herds. The Porcine respiratory and reproductive syndrome (PRRS) virus, Porcine circovirus-2 (PCV-2), Porcine Parvovirus (PPV), Pseudorabies virus (PRV), Classical swine fever virus (CSFV) and Swine influenza virus are known to cause respiratory disease either individual or in combination by concomitant infection. Many of these primary respiratory pathogens adversely impact respiratory defences, leading to the development of costly secondary bacterial bronchopneumonia [5].

The study related to the various clinical complications associated with different body systems of pigs is very much essential to understand the clinical picture of the pig farms so that appropriate therapeutic measures can be initiated. In this context a study had been undertaken in Hassan district to know the various clinical complications associated with pigs with special emphasis on respiratory complications.

Materials and Methods

The data on the information related to the various clinical complications pertaining to the different body systems of pigs was collected by visiting fifty different pig farms of Hassan district by using the self made questionnaire during the period from April 2019 to March 2020. The information was collected based on the observations made by the author in person and the farmers' opinion.

Results

A retrospective study based on the observations of the pig farmers during their entire course of pig farming activities on various clinical complications related to the different body

systems of pigs has been collected through questionnaire. A total of 50 pig farmers of Hassan district who were having ongoing farming activities, the farmers recently vacated the farms, and the farmers who have done pig farming way back few years ago were included and the results were tabulated (Table 1; Fig.1).

Based the data obtained, the clinical problems related to digestive system were in the highest order (96%) followed by systemic/ fever (80%), skin problems (ectoparasites, abscess, red erythematous patches over the body, ear margin necrosis, mange etc.) (64%), problems related to the respiratory system like coughing, laboured breathing, nasal discharge, dryness of snout etc, (46%), reproductive problems (abortion, infertility, still birth, dystocia, testicular enlargement etc.) (38%), endoparasites (28%), urinary system related issues like blood in urine, injury to the penis, etc., (12%). Some of the pig farmers reported the observation related to nervous system (10%) like backward walking, hind limb paresis. The other issues (18%) like infighting, tail biting, etc. were also observed by the farmers. Some of the representative clinical complications of pigs have been depicted in the plate 1 to 12.

Various pig farmers expressed some of the reported signs related to the affections of respiratory system of the pigs, and also the in-person observations made by the author in the piggery farms were tabulated (Table 2; Fig. 2). Among all the signs, anorexia (95.65%) was in highest order followed by lethargy (69.57%), fever and weight loss/ slow growth were in the equal percentages of 65.22 per cent. The coughing, discolouration of extremities, laboured breathing, nasal/ocular discharges, dryness of snout and neurological symptoms like convulsions etc, were in the percentages of 47.83, 34.78, 26.09, 13.04 and 8.70 each, respectively. The overall mortality observed in the farms was found to be 30.43 per cent.

Table 1: Common clinical problems related to the body system of pigs observed by the pig farmers during their entire course of pig farming in Hassan district

Sl. No.	Body system	Number of farms in which the clinical problems were observed	Percentages
1	Systemic/Fever	40	80
2	Digestive system	48	96
3	Respiratory	23	46
4	Urinary	06	12
5	Nervous system	05	10
6	Reproductive	19	38
7	Endoparasites	14	28
8	Skin	32	64
9	Others	09	18

Table 2: Common clinical signs related to the respiratory system observed by the pig farmers during their entire course of pig farming in Hassan district

Sl. No.	Clinical signs	Number of farms in which the signs have been observed	Percentages
1	Coughing	11	47.83
2	Laboured breathing	06	26.09
3	Fever	15	65.22
4	Lethargy	16	69.57
5	Anorexia	22	95.65
6	Discoloration of extremities	08	34.78
7	Weight loss/slow growth	15	65.22
8	Nasal /ocular discharges	03	13.04
9	Dryness of snout	02	8.70
10	Neurological symptoms	02	8.70
11	Deaths	07	30.43

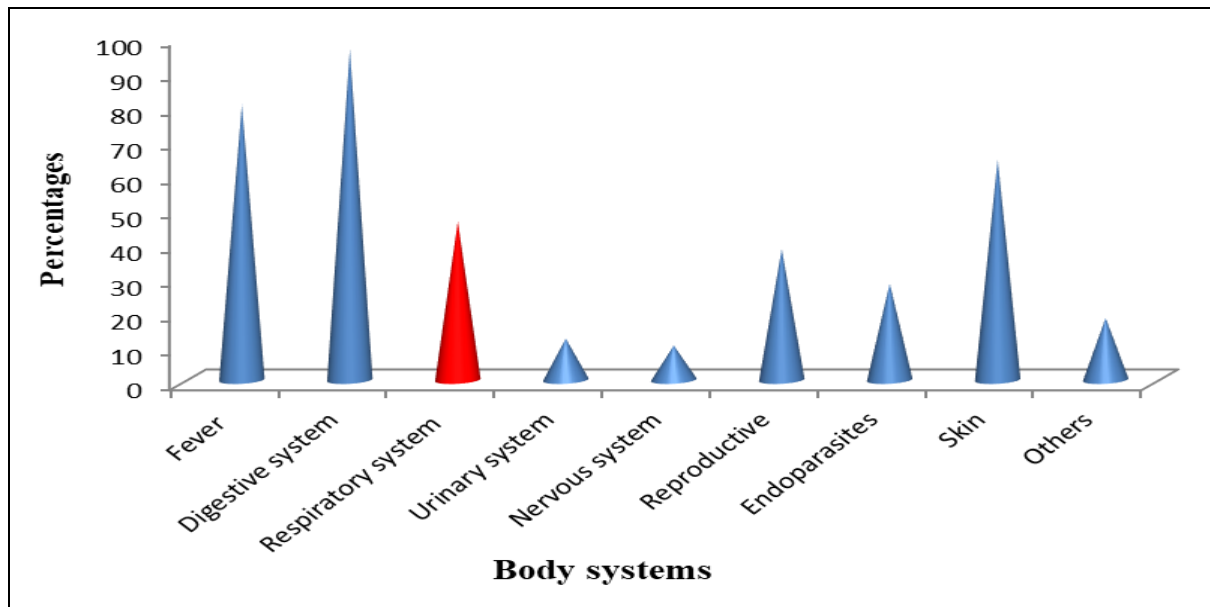


Fig 1: The system wise observations of common clinical problems by the pig farmers during their entire course of pig farming in Hassan district (based on questionnaire data).

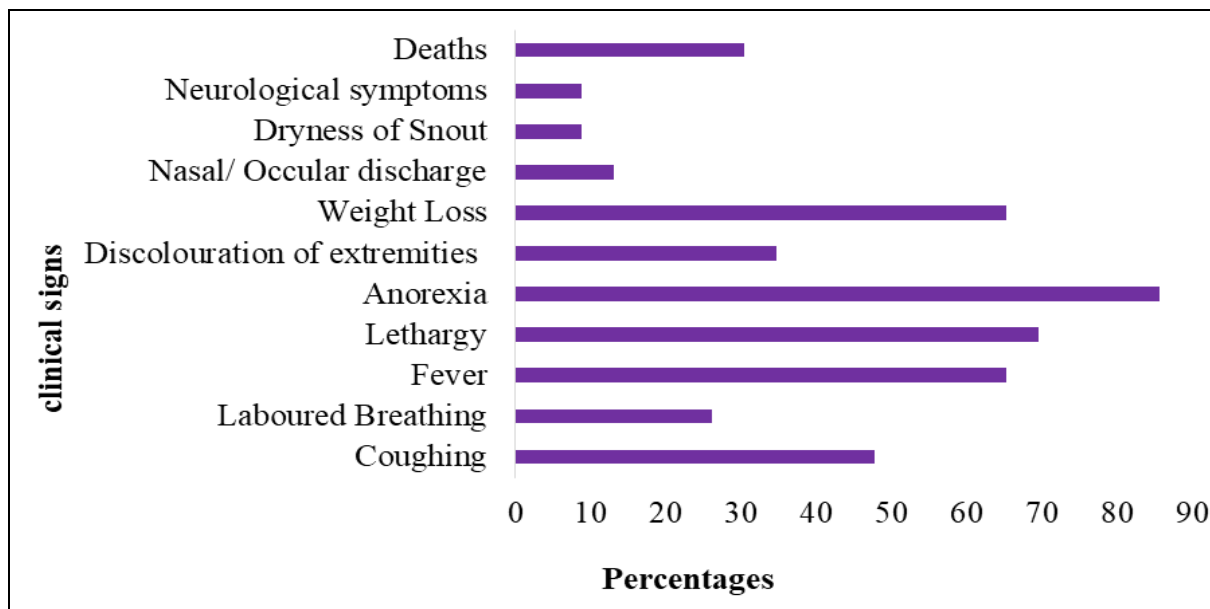


Fig 2: Common clinical signs related to the respiratory diseases observed by the pig farmers during their entire course of pig farming in Hassan district (based on questionnaire data).



Plate 1: Ulcer



Plate 2: Congenital limb abnormality



Plate 3: Haemorrhages at the abdomen



Plate 7: Cutaneous necrotic patches



Plate 4: Hyperaemia of the skin



Plate 8: Abscess at the limbs



Plate 5: Nasal discharge



Plate 9: Ear margin necrosis



Plate 6: Abortion



Plate 10: Stunted growth



Plate 11: Testicular enlargement



Plate 12: Diarrhoea

Discussion

Information regarding various clinical signs observed by the pig farmers of 50 different farms (ongoing and vacated farms) of Hassan district were collected using a questionnaire. It was found that 46 per cent of farms had experienced the problems related to respiratory systems. The findings were clearly depicting that the respiratory complications were commonly observed at a considerable rates in pig farms of Hassan district.

The results observed in the present study are in accordance with Lee ^[6] who analysed the diseases of pigs at AHRI (Animal Disease Diagnostic Centre, Animal Health Research Institute, Taiwan) which indicated that nutritional diseases, skin diseases, neurological symptoms, respiratory symptoms, reproductive symptoms, systemic symptoms etc., were encountered and they also found that before 1993, the distribution of pig diseases had no significant difference. However, after 1993, the respiratory system infection became the dominant disease in pigs because of the invasion of PRRS which occurred in 1992. He also quoted that in the year 2000, the invasion of PCV 2 and Porcine Teschovirus (PTV) had led the marked increase of respiratory disorders in pigs.

The considerable notice of respiratory complications in pigs could be due to the reasons quoted by Opriessnig *et al.* ^[7] who opined that compared to the other domestic animals, pigs are unique because they were typically housed in large groups in relatively small places, thereby providing ideal conditions to maintain pathogens for extended time periods and the pathogens involved in respiratory diseases in pigs vary significantly among the farms, productions sites, region and countries. The present results were in accordance with various workers across India who studied the pneumonic lesions in

pigs which revealed 30.9 per cent in western parts of Uttar Pradesh ^[8], 13.2 per cent in Assam and 61.7 per cent in south-eastern parts of Andhra Pradesh ^[9]. Similarly, Fablet *et al.* ^[10] conducted a cross sectional study in 143 farrow-to-finish pig farms in three regions of western France and found that pneumonia and pleuritis were observed in 69.1 per cent and 14.4 per cent of pigs, respectively, indicating, lung lesions in slaughter pigs were common. However, the information on these aspects in Hassan region was not found. Anoopraj ^[11] opined that the changing scenario of pig husbandry from scavenging system of pig rearing to small piggery units, has contributed to the evolution of respiratory diseases in swine herds in India. Husbandry practices may interact directly with both the infection pressure and the pig susceptibility to lung diseases or indirectly by influencing hygienic factors ^[10]. Yaeger and Van Alstine ^[5] also noted that the increased pressures of rearing pigs in modern-day confinement systems have the potential to overcome robust defences of respiratory system and lead to the development of respiratory disease. In most swine-producing areas, large groups of pigs were housed under intensive conditions, often in geographical regions with a dense pig population. The results obtained in the present study clearly indicated that respiratory problems in the pigs in this region need an intervention to be tackled.

The pig farmers and the author (in-person) have made some observations on the various clinical complications related to the respiratory system of pigs which revealed anorexia, lethargy, coughing, discolouration of extremities, deaths in the herds, laboured breathing, nasal/ ocular discharges, dryness of snout and neurological symptoms like convulsions etc. Constable *et al.* ^[12] summarised that sneezing, coughing, dyspnoea and altered growth parameters were the four basic signs of respiratory disease in pigs. They also reported that the principle sign of PRDC was pneumonia which was manifested as coughing, laboured breathing, fever, lethargy, recumbency, anorexia, discoloration of the extremities/cyanosis, weight loss and slow growth, nasal and ocular discharges and death. Morris *et al.* ^[13] and Stärk, ^[14] opined that respiratory diseases are commonly accompanied by the typical clinical signs of coughing, which could be used to estimate disease prevalence by defining a 'cough index'. This system used on its own seems likely to miss cases because under good environmental conditions subclinical disease may develop. At a herd level, clinical inspection failed to detect 30 per cent of infected herds. The sensitivity of clinical cough is of 37.7 per cent in market pigs when compared with gross lesions at killing, but a comparatively high specificity (76.3%). Coughing is also not considered to be a good indicator of severity, although the inclusion of clinical parameters in other measurement systems has proved to be helpful. Nathues *et al.* ^[15] compared the value of cough index with PCR on bronchoalveolar lavage fluid, and serological testing of blood samples for the diagnosing enzootic pneumonia. They concluded that cough index was the quantitative assessment for the diagnosis of enzootic pneumonia.

The overall signs of respiratory complications observed in the present study were in accordance with the typical signs observed by the other authors. Further, detailed analyses of these signs along with detailed epidemiological correlations are necessary in future studies.

Conclusion

Based on the above results it can be concluded that the

respiratory complications are the one of the major clinical issues among the swine industry. The pig farmers are neglecting the clinical issues related to the respiratory system hence, they need effective strategies for the control.

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