Journal of Sustainable Veterinary & Allied Sciences
P-ISSN-2695-2661 e-ISSN: 2811-1346
JoSVAS 2022, Vol 3, Issue 2: 119-122

Case Report

African swine fever outbreak in a pig farm located at Ossah Umuahia, Abia State, Nigeria – A case report

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ABSTRACT

An outbreak of a disease characterized by fever (41-42^{o}C), depression, cyanosis of the skin, vomiting, bloody diarrhoea, abortion and coma occurred in a flock of 122 pigs in Ossah Umuahia South local government area of Abia-State, Nigeria. Pigs of all ages and sexes were involved and there was 86% mortality. Considering the syptoms and mortality rate, African swine fever was suspected. Test for sera and tissues (spleen, kidney and lymph nodes) from the pigs were sent to National Veterinary Research Institute (NVRI) Vom, Nigeria, and was later confirmed to be African swine fever (ASF) through ELISA and polymerase chain reaction. A boar introduced into the farm from another farm a week prior to infection was suspected to be the source of infection. Quarantine of new animals before introduction to farms was recommended to prevent introducing infection into healthy farms. Disinfection of the affected pens and resting them for four months before restocking was also recommended.

KeyWords: African swine fever, Ossah outbreak, pigs, Umuahia.

INTRODUCTION

African swine fever (*Pestis Africana Suum, Maladie de Montgomery and Varkpes*) is an acute, febrile, highly contagious viral disease of swine. It is a lethal haemorrhagic disease in domestic pigs (Rahimi *et al.,* 2010) and characterized by a short course, high mortality, and gross lesions that resemble those of hog cholera cholera (Dune & Leman, 1975. Ekwe & Wilkinson, 2000). ASF, swine vesicular diseases (SVD), and foot and mouth disease (FMD) are the most dreaded epizootic diseases of pigs. (EU, 2010).

Effects of the disease on pig production, both at household and commercial levels in Africa pose serious socio-economic problems and is a threat to food security (Ayoade & Adeyemi 2003; Lubisi *et al.,* 2003). In Delta State, Nigeria, outbreaks of ASF characterized by mortalities ranging from 50 to 100% in various herds have been reported (Odemuyiwa *et al.,* 2000). ASF has been reported in pig producing states in Nigeria including Lagos, Ogun, Kaduna, Benue, Enugu, Akwa Ibom, Rivers, Plateau and Delta. A total of 125,000 pigs died of ASF between September 1997 and October 1998 in the country (El-Hicheri, 1998).

The causative agent of African swine fever is African swine fever virus which is an enveloped double stranded DNA virus. It is the only known DNA arbovirus. Transmission of African swine fever virus involves cycling of the virus between soft ticks of the genus *Ornitodorus* and wild pigs (warthogs, bush pigs and giant forest boars). The virus can also be transmitted to pigs through ingestion of contaminated feed (Rahimi *et al.,* 2010).

Clinical signs of ASF include fever, loss of appetite and inactivity. Patches of red or blue discoloration on the skin may appear on the ventral chest of the abdomen, tips of tail or distal limbs. Diarrhoea, vomiting, coughing and abortion may also occur. Almost 100%, cases of ASF die within 7 days. Pigs that recover may become lifelong carriers of virus (EU, 2010).

The circulatory system is probably the system most severely damaged by the virus. Lesions associated with ASF include congestion, oedema, ascites, hydrothorax, hydropericardium, infarctions and occasionally necrosis in visceral organs (FAO, 2004). Petechial and ecchymotic hemorrhages are often seen on the epicardium, around engorged coronary blood vessels on the epicardium and on the endocardium.

http://doi.org/10.54328/covm.josvas.2022.094

Petechial (Pin point) haemorrhages on the cortex, medulla and pelvis of the kidneys are typical lesions of ASF. Lymph nodes are enlarged and haemorrhages may be seen on gastro-hepatic and renal lymph nodes (Mebus, 1988). Oedema of the gall bladder and mesentery of the colon is also quite typical of ASF (Murphy *et al.,* 1999). A chronic form of ASF is characterized by pneumonia, pericarditis, pleuritis and arthritis (EU, 2010).

This paper reports what appears to be first confirmed outbreak of ASF in Umuahia, Abia State, Nigeria.

CASE HISTORY

A disease outbreak involving 122 pigs of all ages and sexes was observed in a farm that operated intensive system. A boar was reported to have been introduced into the farm just before the outbreak. At the time of visiting the piggery 105 pigs had died. Clinical signs observed in the sick pigs were weakness, inappetence, staggering gait, oozing of blood from the nostrils, huddling of piglets, fever (39.4-41^{o}C). Cyanosis of skin, melena (Figure I) and vomition were also observed.

SAMPLE COLLECTION

Blood samples were collected from anterior vena cava of sick pigs into vacutainer tubes containing ethylenediaminetetraacetic acid (EDTA) for heamatological analysis. An aliquot of the blood sample was stored at -20 °C till used for DNA extraction and PCR assay. Blood was also collected in sterile bottles without anticoagulant. Serum was then separated in the laboratory and stored at 4°C for Enzyme linked immunosorbent (ELISA) assay. Postmortem examination was conducted on one pig and samples of lymph nodes, spleen, liver, lungs and kidneys were fixed in buffered formol saline. All sick pigs were slaughtered. Carcasses and litters were buried deeply at site with lime. Blood, sera and tissues (lung, liver, lymph nodes and spleen) were sent to the diagnostic centre of the Pan African Centre of Epizootics (PACE) area office in National Veterinary Research Institute (NVRI) Vom, Nigeria for laboratory confirmation.

SAMPLE ANALYSIS

Packed cell volume and haemoglobin concentration of seven sick pigs were determined by methods described by described by Cole (1986). Blocking ELISA for the detection of specific antibodies anti vp73 of ASFV (structural protein with high antigenic power) was determined according to Gallardo (researcher at Centro de Inesti-gacion en Sanidad Animal, Madrid, Spain; pers. comm.). Serologic analysis was performed by using an In-gezim PPA Compac 1.1.PPA K3 ELISA kit (Ingenasa, Madrid, Spain).

PCV ranging between 23 and 28% and haemoglobin concentration ranging between 7 and 9g/dl were observed in the sick pigs. Post mortem lesions including congested heart, lungs, spleen, liver and lymph nodes were observed. There were ecchymotic and petechial haemorrhages on muscles and intestines. There were also blood-stained fluids in the pleural, pericardial and peritoneal cavities. The serum tested positive to ASF by blocking ELISA.

DIAGNOSIS

Tentative diagnosis of ASF was made. Differential diagnoses also considered were Hog cholera, erysipelas, salmonellosis and trypanosomosis. The diagnosis of ASF was confirmed by detection of the antibody by ELISA and virus from the tissues comprising spleen, kidney and abdominal lymph nodes from the report of Polymerase chain reaction (PCR) results received from NVRI.

DISCUSSION AND RECOMMENDATION

The high mortality observed in this case agrees with those of Mailafia and Iliya (2007) and Lazarus *et al.* (2010), who observed similar high mortality in pigs infected with ASFV. Mortality in young and adult pigs of both sexes seen in this case was also reported by Sanchez-Viz *et al* (2012). The range of PCV and Hb recorded in the sick pigs were lower than the reference values. Thus, the PCV range of the sick pigs was 23-28% which is lower than 33-50% recorded in healthy pigs (kaneko, 1997). The range of Hb in the sick pigs 8was 7-9g/dl which is also lower than 10-15g/dl recorded in healthy pigs (Dunkan & Prasse, 1986). These low values of PCV and Hb indicated that the sick pigs had anaemia which may be due to the bloody diarrhea and oozing of blood from nostril observed. Diagnosis of ASF was established in this investigation by blocking ELISA assay which agrees with similar work by Eric *et al.* (2011) and also amplification of a fragment of the structural protein VP72 of the virus from the tissues of infected pigs using the PCR technique (Odemuyiwa *et al.,* 2000). Previous workers have shown that detection of this fragment of the VP72 of ASFV in tissues is specific for the diagnosis of the virus infection (Leitao *et al.,* 1998; King *et al.,* 2003).

The prevention and control of African swine fever are difficult because there is no vaccine for the infection, transmission of virus in fresh meat and pork products and the existence of persistent infection in some swine, the clinical similarity of hog cholera, and the recognition that soft ticks in some part of the world are involved in transmission of the virus (Lazarus *et al.*, 2010). The presence of the virus in ticks and warthogs in many countries of sub-Saharan Africa makes it difficult to break sylvatic cycle of the virus. However, domestic swine can be reared in Africa if the compensation, rather than reduce the problem, it is aggravated, because pig farmers choose to sell their infected animals as live pigs and pig products. It has therefore been recommended that compensation be paid to pig farmers to enable them restock (Hicheri, 1998). This will make farmers report the disease instead of spreading it by mass sales of

Figure I: Piglets with fever huddling together in Ossah Umuahia, Abia State, Nigeria

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Figure II: Mortality of large number of pigs of different ages suspected to have died African swine fever in Ossah Umuahia, Abia State, Nigeria.

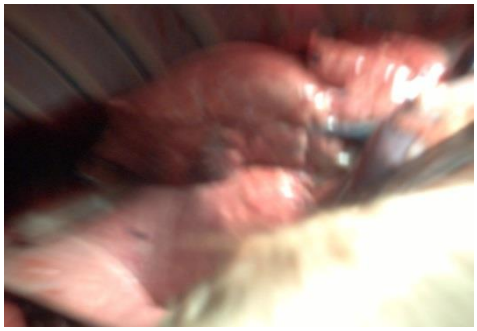

Figure III: Congested lungs of a pig that died of African swine fever in Ossah Umuahia, Abia state, Nigeria.

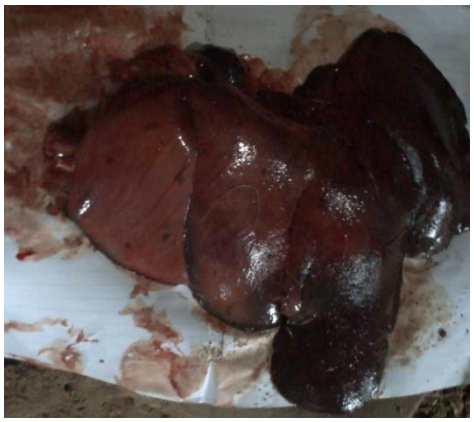

Figure IV: Congested spleen of a pig that died of African swine fever in Ossah Umuahia , Abia state, Nigeria.

Figure V: Congested liver of a pig that died of African swine fever Ossah Umuahiam Abia state, Nigeria.

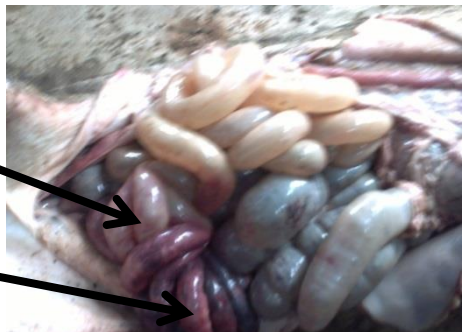

Figure VI: Ecchymosis and petechial haemorrhages on muscles and intestines ofa pig that died of African swine fever in Ossah Umuahia, Abia state, Nigeria.

infected pigs management system avoids feeding uncooked waste food scraps and prevent access of ticks and contact of warthogs, usually by double fencing with a wire mesh perimeter fence extending beneath the ground (Murphy *et al.*, 1999). Control depends first on early recognition and rapid laboratory diagnosis. Once African swine fever is confirmed in a country that has previously been free of disease, it is important to carry out prompt action to control and then eradicate it.

A recent workshop revealed slaughter without adequate.

The affected farm was advised to slaughter all sick pigs and carcasses and litters buried deeply at site with lime. They were also advised to disinfect and fumigate the pens and allow them at least 4 months rest before restocking. Practices such as loaning boars, feeding of swill to pigs that contain

raw or insufficiently cooked pork and pig remnants or access to such remnants through scavenging should be avoided.

CONCLUSION

The confirmation of African swine fever using ELISA and PCR assay in this report indicates for the first time ASF outbreak in Ossah Umuahia, Abia State, Nigeria. This has also added to epidemiology knowledge of ASF in Nigeria.

ACKNOWLEDGEMENT

The authors are grateful to management of NVRI Vom and numerous staff that assisted in the laboratory work.

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