African swine fever: An emerging threat to Asian countries

Sheng-Fan Wang[1], Wen-Hung Wang[2], Max R. Chang Ishcol[3], Chih-Yen Lin[1]

Wang SF, Wang WH, Ishcol M, et al. African swine fever: An emerging threat to Asian countries. J Exp Clin Microbiol. 2019;2(1):14-15.

African Swine Fever (ASF) outbreak has been reported in China. ASF Virus (ASFV) is highly contagious and causes almost 100% fatality in domestic pigs when they get infected. The first identified case of ASF was in Liaoning province in north-east of China in August, 2018. After that, three more ASF outbreaks were officially announced. Although Chinese Government announced that ASF outbreaks have been monitored and still under control, the truth might be more serious. Currently, several Asian countries initiated aggressive inspection of the imported pork or pig related products. The diagnostic reports from the Council of Agriculture of Taiwan indicated that the ASFVs had been detected in the selling of imported pork or pork related products from different provinces of China. This warns that ASF is continuously posing an active threat to all Asian countries.

African Swine Fever (ASF), a highly pathogenic disease is caused by the ASF Virus (ASFV), the only member of the family *Asfaviridae*, with a complicated molecular structure and double-stranded DNA genome [1]. The transmission of this virus can be through the interaction of arthropods such as soft ticks of the genus Ornithodoros, being *O. moubata* and *O. eraticus* are implicated in the sylvatic transmission cycle of the virus in Africa and in Europe respectively [2,3]. The finding of an acute disease in wild boards similar to the domestic pig, implies a significant role in the transmission cycle in Europe [4-6]. Humans are not a susceptible host for ASFV, unlike domestic pigs that had shown high susceptibility with almost 100% mortality as a result of ASFVs infection, leading to large economic losses. ASF has been considered cross-border animal disease, as it can be spread by live or dead pigs, as well as among domestic or wild, and even can remain infectious in pork products. Some key parts in the transmission of this virus that sometimes keep neglected are contaminated fodder and fomites (non-living objects such as footwear, clothes, vehicles, farm and abattoir equipment, etc.) as the ASFV has a high environmental resistance [7,8]. The elevated mortality of ASFV in domestic pigs in affected regions, the introduction of sanitation measures (as culling complete farm animal population) as well as pig trading and movement restrictions, all these factors entail a high socio-economic impact on pig production, global trade and food safety hence affecting the well-being of people. This disease has a higher impact in developing countries, where most of the farmers are low income and rely on pigs as a relatively affordable source of protein and as an additional income.

ASFV was firstly found in Kenya in the 1920s [9] and it was restricted to Africa until the middle of the last century when it spread to Europe, and affecting later South America and the Caribbean. In Europe, ASF had been eradicated in the 1990s by drastic control and eradication programs [10,11]. However, in 2007 the disease was spread again out of Africa into the Caucasus and reached on 2014 the eastern zone of the European Union. The current reports of ASF indicate the emergence of outbreaks in several EU countries, such as Poland and the three Baltic Republics and Moldova [12,13]. At this time, it is still lacking of vaccine for prophylactic use, therefore in every country, the prevention and efficient control of ASFVs relies on well-control plans by their Agricultural Services and Government policies.

In August 2018, China reported to have ASF outbreaks [14]. Although Chinese Government claims that ASF has been under well control, several dead pigs were found on the coast of Kinmen County and Penghu Pescadores, two small islands on the south east of China, suggesting that the dead pigs were originally from certain provinces of China and shoved by the ocean currents to the land. Unfortunately, on these death sick pigs was detected ASFVs infection by using PCR and direct sequencing by the Council of Agriculture of Taiwan [15], suggesting that the ASF epidemics might be more severe and may be disseminated to many provinces of China. A recent report indicates that virulent genotype II strain is related to ASF outbreaks, and the isolate China/2018/AnhuiXCGQ strain shared a high similarity with POL/2015/Podlaskie strain. Phylogenetic analysis data indicated that the China/2018/AnhuiXCGQ strain and 4 European genotype II strains are grouped into 3 clusters, suggesting that Chinese ASFVs is highly correlated with European ASFVs and they are still undergoing genetic diversity and evolution [16]. At this moment, the continuous monitoring and the development of the rapid and accurate diagnostic assays are demanded. ASFVs post great threat to all Asian counties now that has been identified a door of entry. The implementation of prevention and control plans and aggressive inspection of every pork or pork related products from ASF epidemics regions are needed, as well as reinforcement on immigration and customs measures to protect the integrity and economy of swine production.

DECLARATION OF CONFLICTING INTEREST

The authors declare no conflict of interest.

REFERENCES

1. Magadla NR, Vosloo W, Heath L, et al. The African swine fever control zone in South Africa and its current relevance. Onderstepoort J Vet Res. 2016;83.
2. Anderson EC, Hutchings GH, Mukarati N, et al. African swine fever virus infection of the bushpig (Potamochoerus porcus) and its significance in the epidemiology of the disease. Vet Microbiol. 1998;62:1-15.
3. Kleiboeker SB, Scoles GA, Burrage TG, et al. African swine fever virus replication in the midgut epithelium is required for infection of Ornithodoros ticks. J Virol. 1999;73:8587-98.
4. Blome S, Gabriel C, Beer M. Pathogenesis of African swine fever in domestic pigs and European wild boar. Virus Res. 2013;173:122-30.
5. Gavier-Widen D, Gortazar C, Stahl K, et al. African swine fever in wild boar in Europe: A notable challenge. Vet Rec. 2015;176:199-200.
6. Li L, Wang Q, Ge S, et al. Infection of African swine fever in wild boar, China, 2018. Transboundary and Emerging Diseases. 2019.
7. Olesen AS, Lohse L, Boklund A, et al. Short time window for transmissibility of African swine fever virus from a contaminated environment. Transboundary and Emerging Diseases. 2108;65:1024-32.
8. Wieland B, Dhollander S, Salman M, et al. Qualitative risk assessment in a data-scarce environment: A model to assess the impact of control measures on spread of African Swine Fever. Preventive Veterinary Medicine. 2011;99:4-14.

[1]Department of Medical Laboratory Science and Biotechnology, Kaohsiung Medical University, Kaohsiung City, Taiwan; [2]Division of Infectious Disease, Department of Internal Medicine, Kaohsiung Medical University Hospital, Kaohsiung Medical University, Kaohsiung City, Taiwan; [3]Program in Tropical Medicine, College of Medicine, Kaohsiung Medical University, Kaohsiung City, Taiwan

Correspondence: Sheng-Fan Wang, Department of Medical Laboratory Science and Biotechnology, Kaohsiung Medical University, Kaohsiung City, Taiwan. Telephone: +886-7-3121101; e-mail: :wasf1234@kmu.edu.tw

Received: 1 February 2019, Accepted: 5 March 2019, Published: 21 March 2019

9. Montgomery RE. On a form of swine fever occurring in british east Africa (Kenya Colony). J Comp Pathol Ther. 1921;34:159-91.
10. Galindo I, Alonso C. African Swine Fever Virus: A Review. Viruses. 2017;9:103.
11. Cubillos C, Gomez-Sebastian S, Moreno N, et al. African swine fever virus serodiagnosis: a general review with a focus on the analyses of African serum samples. Virus Res. 2013;173:159-67.
12. Wozniakowski G, Kozak E, Kowalczyk A, et al. Current status of African swine fever virus in a population of wild boar in eastern Poland (2014-2015). Arch Virol. 2016;161:189-95.
13. Pejsak Z, Truszczynski M, Niemczuk K, et al. Epidemiology of African Swine Fever in Poland since the detection of the first case. Pol J Vet Sci. 2014;17:665-72.
14. Li X, Tian K. African swine fever in China. Vet Rec. 2018;183:300-1.
15. Taiwan COA. Council of Agriculture of Taiwan. 2018.
16. Bao J, Wang Q, Lin P. Genome comparison of African swine fever virus China/2018/AnhuiXCGQ strain and related European p72 Genotype II strains. Transbound Emerg Dis. 2019.