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BREEDING OF BIRD FLU ON BREAST CHICKEN AND THE POSSIBILITY OF ITS CONNECTION WITH THE CASE OF BIRD FLU INHUMAN IN PROVINCE OF BALI INDONESIA

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ABSTRACT

Cases of human bird flu had been reported in Bali province in the middle of August 2007. The two cases, each from Jembrana and Tabanan district were associated with exposure to avian influenza virus H5N1. Death in humans due to the H5N1 virus was strongly associated with the outbreak of avian influenza H5N1 in village chickens in Bali province. Data of poultry bird flu at Balai Besar Veteriner Denpasar showed an increase of bird flu cases in village chickens which occured from January until September 2007. From a total of 105 poultries cadaver necropsied at Pathology Laboratory, 86,66% were village chickens and 5(63,74%) were positive bird flu H5N1. This cadaver came from Kabupaten Badung (38,09%), Tabanan (15,24%), Klungkung (10,47%), Gianyar (8,57%), Jembrana (4,76%), Buleleng (3,81%), Bangli (1,90%) and Kotamadya Denpasar (17,14%) respectively. This paper reported an outbreak of bird flu in village chickens and possibility its relationship to the first evidence of human bird flu in Bali province in the midle of August 2007.

KEYWORDS: An Outbreak, Bird Flu, Village Chickens.

INTRODUCTION

Avian influenza (AI) is an infectious disease in humans and animals and is caused by influenza viruses belonging to the Orthomyxoviridae family (Alexander and Brown, 2000). Influenza viruses are grouped into three types, namely A, B, and C based on their antigenic characteristics of core proteins. Among the three types of influenza virus, influenza type A virus is the most dangerous because it can attack humans, poultry, pigs, horses, and other animals and is capable of causing pandemics (Gupta and Nath, 2004; Anon., 2006). History has noted that influenza pandemics occurred in 1918 (H1N1), 1957 (H2N2), and 1968 (H3N2) (Ligon, 2005) caused by influenza viruses whose hemagglutinin (HA) and neuraminidase (NA) genes are mostly from poultry (Marshall, 2005; de Jong and Hien, 2006).

In 1997, there was a case of bird flu in humans in Hong Kong caused by the H5N1 avian influenza virus whose genetic structure was far different from the causes of influenza pandemics in previous years. Furthermore, the outbreak of H5N1 bird flu in poultry reappeared late in 2003 and expanded in Asian continent countries such as Cambodia, China, Vietnam, Laos, Indonesia, Thailand, South Korea, and Japan (Ligon, 2005; Marshall, 2005). In the same year, Vietnam and China reported cases of H5N1 bird flu in 3 and 1 people each died. In Indonesia, cases of bird flu in humans began to occur in 2005 with the number of cases as many as 19 people and 12 of them died. Until November 2007, the number of cases of bird flu in humans in Indonesia was 113 cases and the number of deaths was 91 people. This is the number of cases of death caused bird flu in the highest human in the world (Anon., 2007).

Most cases of H5N1 bird flu in humans in Asian countries including Indonesia have a history of contact with birds infected with the H5N1 bird flu virus (Bridges et al., 2002; Hien et al., 2004; Frauser et al., 2004). This is closely related to the traditional poultry farming system in Asia where chickens, ducks, geese, and other birds are farmed together in locations adjacent to people's homes so human contact with poultry is very easy (Webster, 2004; Yuen and Wong, 2005).

In this paper, the outbreak of H5N1 bird flu in domestic chickens and the possible link to the incidence of avian influenza in humans occurred in the province of Bali in the middle of August 2007.

MATERIALS AND METHODS

1. Bird Flu Event Data in Poultry and Birds in Bali Province in 2007
All poultry carcasses and birds that enter the Denpasar Veterinary Center are recorded in the Epidemiology section. Data regarding the origin of the sample, the type of poultry and the history of the disease were recorded by the sample recipient officers, then the poultry carcasses were distributed to the Pathology Laboratory to be dropped.

2. Examination of the Pathology and Virology Laboratory
Poultry carcasses that enter the Pathology Laboratory are systematically discharged. The anatomical pathology changes were observed carefully. If there are indications that lead to bird flu, then the organ sample is taken aseptically for isolation and identification of the virus. Some 2X2X1 cm samples were taken and included in 10% buffer neutral formalin for histopathological examination.

RESULTS

During the period of January to September 2007, the Denpasar Veterinary Center received 105 samples in the form of poultry and bird carcasses from various districts/cities in Bali Province and mostly from Badung Regency (Graph 1). The poultry carcasses consisted of: domestic chicken (91 tails), ducks (6 tails), laying hens (3 tails), *entok* (2 tails), birds (2 tails), and broilers (1 tail) (Table 1), which the number of shipments increased quite sharply in August 2007 (Graph 2) in line with the occurrence of cases of bird flu in humans originating from Jembrana and Tabanan districts. The results of the Pathology Laboratory examination showed that of 105 poultry and bird carcasses that were deceived, (77.14%) were diagnosed with pathological AI and after continuing to isolate and identify the virus it turned out (63.81%) positive for the H5N1 bird flu virus (Table 1).

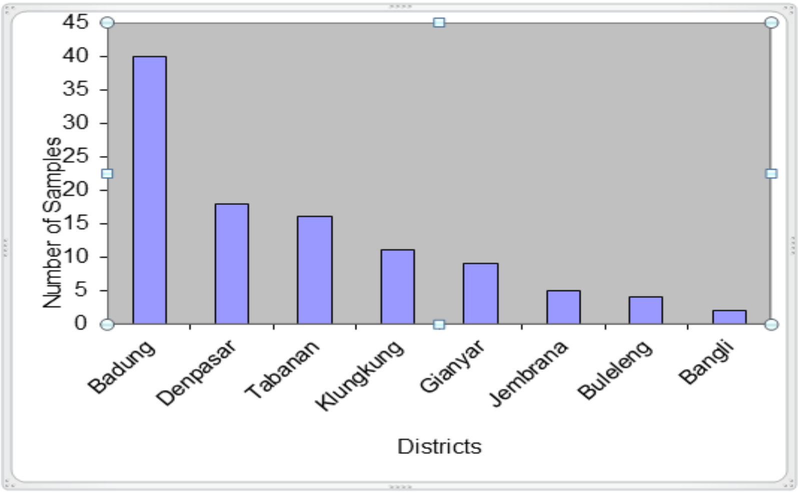

Figure 1. The number of poultry carcasses originating from various regencies/cities in Bali Province from January to September 2007.

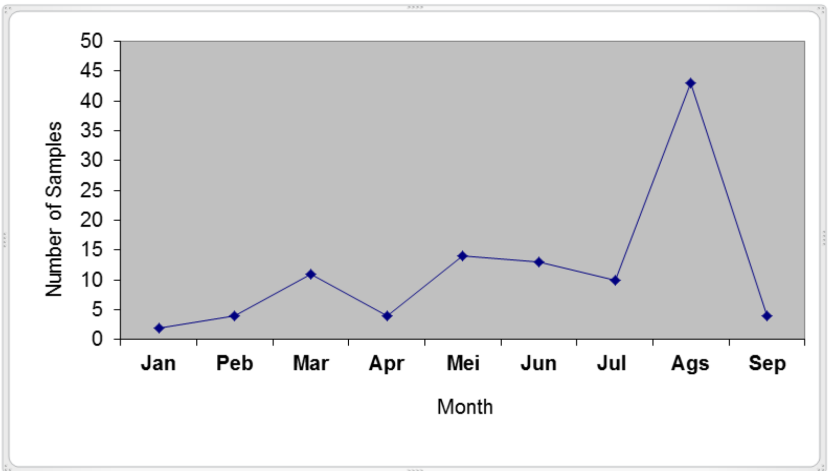

Figure 2: The number of poultry carcasses sent to the Denpasar Veterinary Center for the period of January to September 2007.

Table 1: Diagnostic results of the Pathology Laboratory and confirmation of the Virology Laboratory for various birds and birds entering the Denpasar Veterinary Center for the period January to September 2007.

Type of Poultry	Number of Samples	Pathology Diagnosis				Virological Conformation	
		AI	Inf. Viral	P.m.a	T.a.p	+ AI	- AI
Free-Range Chicken	91	72	8	10	1	58	33
Duck	6	5	-	-	1	3	3
Layer	3	3	-	-	-	3	0
Darn	2	1	-	1	-	1	1
Bird	2	-	-	-	2	2	0
Broiler	1	-	1	-	-	0	1
Total	105	81	9	11	4	67	38

DISCUSSION

Since the outbreak of H5N1 bird flu in poultry in Bali Province at the end of 2003 which mostly attacked laying hens and broilers, the outbreak of H5N1 bird flu that occurred in August 2007 was more common in domestic poultry (Table 1). In the same month, for the first time in the Province of Bali, there were bird flu cases which killed two people from Jembrana and Tabanan Districts wherein the two districts were hit by an outbreak of H5N1 bird flu in domestic chickens (Graph 1).

The domestic chicken is very closely related to the life of the people of Bali. Almost every family in Bali maintains free-range chicken both to support their daily needs and for religious ceremonies. The low understanding of the public about the dangers of bird flu makes people less concerned about the health of their chickens. If there are chickens that die from the sea, the community throws them into a garbage dump or is swept into the river. If there are sick chickens, the healthy rest is sold to reduce losses. Chicken collectors also play an important role in the spread of bird flu. Subclinical ducks/bird flu that appears to be healthy are purchased from livestock farmers and sold from one poultry market to other inter-district poultry markets. This is one of the factors that triggered the outbreak of bird flu so quickly spread between districts in Bali Province. Poultry that is sold in the market (live bird market) acts as a place to mix the bird flu virus (Shortridge et al., 2003). Chickens, ducks, geese, and other birds that are sold on the market in cages that are cramped and close to each other so it is very easy to stress is a very favorable place for influenza viruses to form new formations, reassortment and facilitate the transmission of the virus to humans.

Transmission of the H5N1 bird flu virus to humans can occur in line with the outbreak of bird flu in poultry. Transmission can be through inhalation, direct contact or indirect contact (Bridges et al., 2003). However, most cases of bird flu in humans occur because of contact direct patients with infected poultry (Barclay and Zambon, 2004; Beigel et al., 2005: Fauchier et al., 2005). Although there have been several cases of human deaths from bird flu there is no history of their contact with sick/dead birds (Wong et al., 2006). The deaths of two people positive for H5N1 bird flu from Jembrana and Tabanan Regencies were allegedly due to contact with birds attacked by bird flu, but the mechanism of transmission of the H5N1 AI virus to humans in the two districts to date is unknown.

The results of the pathological examination, isolation, and identification of the virus showed the presence of ducks, ducklings and turtle birds that were positive for the H5N1 influenza virus (Table 1). Ducks, ducklings, and other wild birds are natural reservoirs of influenza viruses and are risk factors for bird flu outbreaks on commercial farms and people's farms (Hinshaw et al., 1980; Songserm et al., 2006). Viruses originating from various subtypes 16 HA and 9 NA can synergize well in waterfowl without causing clinical symptoms. From this reservoir poultry, influenza A virus spreads to poultry and other mammals including humans, causing an outbreak that is quite alarming (Sturm-Ramirez et al., 2005). In ducks, the H5N1 bird flu virus replicates efficiently in the respiratory and gastrointestinal tracts. Viruses released through feces contaminate other ducks and their environment and potentially spread to other poultry species. Water for feeding and drinking for ducks can potentially transmit influenza viruses to humans and other animals (Hulse-Post et al., 2005). Webster et al., (1978) states that influenza viruses can still survive in fresh water for 4 days at 22oC and more than 30 days at 0oC. In chicken manure, influenza viruses can survive for 8-12 hours at 28-30oC and for 20 days at 4oC (Lu et al., 2003)

CONCLUSIONS AND RECOMMENDATIONS

1. Conclusion

There may be a connection between the outbreak of H5N1 bird flu in domestic chickens and the incidence of human bird flu cases, which occurred in mid-August 2007 in Jembrana and Tabanan Regencies. This can be seen from the number of poultry carcasses/birds that were sent to the Denpasar Veterinary Center in August 2007 and in the same month a case of bird flu in humans for the first time in Bali Province, but how the H5N1 virus transmission mechanism to humans in the two districts are not certain yet.

2. Suggestions

a. Public awareness about how dangerous bird flu disease still needs to be improved and socialized. Counseling about the dangers of bird flu in humans is still very important to do both through television, radio, newspapers, banners and so on so that people begin to know and be aware of the dangers of bird flu in humans. Thus, cases of bird flu in humans can be prevented as early as possible.

b. To prevent widespread cases of avian influenza in humans, various strategies can be carried out, including quarantine and destruction of poultry infected with the virus influenza, providing appropriate compensation to farmers whose birds are destroyed, and implementing and increasing biosecurity of poultry facilities. Vaccination of healthy poultry is needed by using good quality vaccines. Furthermore, it is necessary to conduct supervision and guidance on poultry markets about bird flu and so on.

CONFLICT OF INTEREST

The authors have no conflict of interest to declare.

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