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Isolation of influenza viruses from swine in Kazakhstan

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ype A influenza viruses are unique among agents of infections in both humans and a variety of mammals (horses, swine, whales, seals, etc.) and birds. Due to the fact that the swine are susceptible to influenza A viruses of human and birds, they are considered intermediate host in which the genetic reassortment takes place between swine, human and avian viruses. Reassortment may lead to the emergence of new antigenic variants of influenza virus with the potential to cause epidemics in humans. However, the level of virulence and epidemiological activity of different virus variants seems far from being identical and depends on both the molecular biological features of the strains, and characteristics of their ecology. This determines the need for monitoring of circulating influenza viruses among swine in the key points located on the major migratory channels of birds. North and South regions of the Kazakhstan are historically established places for migration and aggregations of migrating birds. Collection of biological materials was carried out during the spring and autumn migration of birds, as well as in the epidemic season, when the probability of detecting swine influenza virus increases. 508 biosamples (337 nasopharyngeal swabs and 171 blood sera) have been collected from swine of the small and large pig farms of Kostanai, Karaganda, Aktobe and Almaty oblasts in 2014. Primary screening of 256 biosamples (nasopharyngeal swabs), carried out in RT-PCR using AmliSens PCR test system produced by the Institute for Epidemiology (Moscow), showed the presence of genetic material of the influenza virus in 86 samples (33.6% of the total number of examined samples). Influenza A/H1 virus RNA was detected in 35 samples (13.7%), A/H3 virus RNA - in five samples (1.95%). RNA of simultaneously both influenza virus subtypes (Hsw1+ H3N2) was also detected in one sample (0.4%). These data indicate circulating influenza virus of mixed etiology with a predominance of influenza A/Hsw1 virus in the swine population. As a result of primary infection of chick embryos with 256 biosamples collected from swine in various regions of Kazakhstan, 12 GAA have been isolated with the hemagglutination titres of 1:2-1:16 and infective activity of 2.67-3.75 lgEID_{50/0.2ml}. Identification in HAI and NAI assays of five isolates from Almaty (10/14), Karaganda (04/14 and 16/14) and Kostanai (12/14 and 24/14) oblasts enabled to attribute them to influenza A virus with the H1N1 antigenic formula. Serological analysis of 171 blood sera collected from healthy and sick swine in the pig farms of Karaganda oblast to detect antibodies against influenza A/H1N1 and A/H3N2 virus was carried out in IEA and HAI assay. The greatest number of specific antibodies both in IEA and HAI was revealed against the A/H1N1subtype of the influenza virus. Thereby, the findings confirm the circulation of influenza A/H1N1 virus in the swine population on the territory of the Northern and Southern Kazakhstan. All this dictates the need for molecular epizootological monitoring of swines for the earliest detection of potential pandemic strain of influenza virus.

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