

Reassortment with H9N2 or NS1-mutations increased virulence of avian-influenza-H5N8 2.3.4.4 in mice but compromised virus transmission and replication in chickens

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Avian influenza viruses (AIV) infect a wide range of birds and mammals. The panzootic H5N8 clade 2.3.4.4 and H9N2 are widespread in poultry. Although both H5N8 and H9N2 exhibit only low virulence in mammals, there is a risk for evolution of potentially zoonotic H5N8 viruses after mutations or reassortment of H5N8 and H9N2 viruses. Here, the virulence of H5N8 after reassortment with H9N2 or carrying mutations in the NS1 was studied in mice and chickens. In mice, reassortment with H9N2-PB2 and to lesser extent PA or NS increased the virulence of H5N8 in mice as indicated by rapid onset of mortality and increased body weight loss. In chickens, reassortment with H9N2 reduced virus virulence, replication and/or transmission with a prominent role for the NS segment in chicken-to-chicken transmission. Likewise, mutations in the NS1 of H5N8 increased virulence of the virus in mice; however, it reduced virus replication and transmission in chickens. Together, reassortment with H9N2 or mutations in NS1 may result in H5N8 viruses with higher virulence in mammals but compromised virus fitness in chickens. This study is important for zoonotic risk assessment of the widespread H5N8 and H9N2.

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