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Seropositivity of avian influenza serotype H9: A complex phenomenon for virulent New-Castle disease outbreaks in commercial chicken population of Pakistan

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Avian Influenza Virus (AIV) infections have caused enormous economic losses to the poultry industry in Pakistan as well as in other regions of the world. The first introduction of H7N3 AIV to Pakistan occurred during 1995, since then H7N3, H9N2 and H5N1; AIVs has been sporadically isolated in 1997, 1999, and 2005-2008 respectively. As previously reported during 1995-2004, the occurrence and re-assortment between H7N3 and H9N2 viruses in the poultry population documented as co-infection. However, the endemic nature of the Newcastle Disease (ND) prevalence can never be ruled out. All 8 genes in the predominant H7N3 virus lineage have evolved to be phylogenetically distinct. The underline infection of H9N2 has been found well adapted in chicken population. Seroprevalance data-2015 indicate that chickens from the backyard farming neither vaccinated against AIV nor NDV, showed high HI titer $10.0 \log^2$ whereas the NDV titer $>5-6 \log^2$. Since, there is one primary H7 lineage which persists and that has reassorted with the H9N2 AIV in poultry. It suggests that there is a reservoir with some link in commercial/backyard poultry. Chickens vaccinated with AIV serotype H9 provide 60% protection against virulent NDV challenge in laboratory trial. Seropositivity to Avian Influenza Virus Subtype H9N2 among Human population who are involved in the marketing of live chicken meat and had more or less similar titer against H9 are $>4-5 \log^2$. However, more research work needs to be done to study the co-infection of the different serotype and the NDV infection in the poultry as well as in the human population due to risk of assortment of AIV in the field.

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