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Antigenic difference of HN protein between the vaccine strain and the challenge strain of Newcastle disease virus significantly affects virus shedding and transmission

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Newcastle disease (ND) is caused by virulent Newcastle disease virus (NDV), which leads to heavy economic losses to poultry industry. Even though intensive vaccination programs have been implemented in many countries, virulent NDV can still be frequently isolated in well-vaccinated flocks. We tested the protection efficiency of LaSota and two sub-genotype VIId vaccines, NDV/AI4 and O/AI4, while O/AI4 was constructed by replacing the *HN* gene of the vaccine strain NDV/AI4 with that of the variant NDV strain JS-14-12-Ch. The cross-neutralization and cross-hemagglutination inhibition tests between JS-14-12-Ch and the three vaccine strains indicated the significant antigenic difference between JS-14-12-Ch and LaSota as well as NDV/AI4, but not between JS-14-12-Ch and O/AI4. The results of vaccine protection tests showed that O/AI4 provided improved protection as determined by a significant decrease in both the number of birds shedding, the amount of virus shedding, and virus replication in visceral organs from challenged birds. This study suggested that ND vaccine strain which antigenically and genetically matches with prevalent field strains provides significant better protection than the conventional ones, in terms of reducing virus shedding and transmission.

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Paucity of infection of humans and other livestock in direct contact or in housed in proximity of a dromedary camel herd with documented MERS coronavirus infection

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Middle East Respiratory syndrome coronavirus (MERS) is one of the major health concerns worldwide. Dromedary camels are likely to be a natural host of MERS. Transmission between camels is clearly documented. However, it is still unclear whether this is the only natural host for this virus. Clearly, transmission from camels to humans is not efficient and infection is not directly proportional to exposure. Heterogeneity of human susceptibility to MERS infection may be one possible explanation. On the other hand, many human cases of MERS do not have an obvious history of direct exposure to camels or their products. Thus, the possibility of another intermediate host in MERS transmission to humans remains possible. To test this hypothesis, different samples were collected from positive MERS camel populations. Serum samples were also collected from people in close contact with these animals. Samples from birds shared the habitat with these animals such as doves, sparrow as well as from sheep and goat flocks in close proximity of these animals were collected. Samples from mites, ticks, mosquitoes and flies were also collected from these flocks. Detection of the virus was done by Real time PCR while detection of the viral antibodies was done by the Pseudovirus particle neutralization assay. Absence of antibodies in sera of close contact people, sheep, goat, and birds was reported. Only camels showed neutralizing antibodies. Meanwhile, swabs from tested birds, flies and mosquitoes were negative. Thus, transmission of MERS is too complicated. Further studies are needed to study the human/MERS/camels interactions.

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