

Avian Hepatitis E Virus: Economical and Public Health Concerns

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Abstract

Avian HEV (aHEV) belongs to genus Orthohepevirus, which is placed in family Hepeviridae as a separate species Orthohepevirus B. The genome of aHEV comprises of single strand positive sense RNA which 6.6 kb long and is 600 bp shorter than those of swine and human HEV genotypes. The shorter portion of aHEV genome compared to the mammalian HEV (mHEV) falls in ORF1 between methyltransferase (MeT) and helicase (Hel). Like other genotypes, it also consists of three open reading frames (ORFs) which are; ORF1, ORF2 and ORF3. The similarity of aHEV on the basis of capsid protein amino acids sequence is above 98 % among its genotypes (1-4), but it is 48-49 % in case of capsid proteins of other genotypes of HEV including human and swine HEV. So far, four different genotypes of aHEV, isolated from chickens, have been reported and interestingly all four genotypes represent single serotype which may encourage the development of single vaccine for all four genotype. Recently we have reported a novel isolate from Pakistan in layers which may be potentially new genotype. Apart from chicken, a novel avian-like HEV was reported in wild little egret (*Egretta*

garzetta). But the identification of novel HEV strains related to mHEV (ferret and rat) in carnivorous wild prey bird kestrel (*Falco tinnunculus*) and red-footed falcon (*F. vespertinus*), suggested the broader host range of HEV than we had before. No zoonotic risk associated to aHEV is reported till date as it is limited to chickens in natural conditions. The experimental attempts of cross-species infection with aHEV to mice and rhesus macaques were not successful. However, experimental infection was obtained in turkeys (*Meleagris gallopavo*) with subsequent transmission to control turkeys from infected one. Similarly, in a recent study identification of aHEV genotypes 1 and 3 from 62 species of different wild birds indicated cross-species transmission risk among avian species. This further alarms the future zoonotic trend of aHEV which may be a big public health concern if it evolves to cause infection in human as chicken and its products are main components of human food. Moreover, aHEV causes significant economic loss by decreasing egg production 30 – 40% and increasing mortality 1 – 4%. In this scenario, aHEV may be considered a possible risk for public health and economy related to poultry industry.

Citation : Dr. Tahir Iqbal, Avian Hepatitis E Virus: Causes and Clinical Profiles of Ascites at University of Gondar Hospital, Northwest Ethiopia: Institution-Based Cross-Sectional Study, Webinar on Virology and Rare Diseases, March 20, 2021.