Detection of Hepatitis E Virus (HEV) Infection in Pigs, Zoo Animals and Environmental Rodents in Taiwan

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ABSTRACT Hepatitis E virus (HEV) is the major cause of enterically transmitted non-A, non-B hepatitis in many developing countries and is also endemic in many industrialized countries. The recent discovery of HEV in domestic pigs and wild animals in United States and Japan, respectively, has suggested that HEV may be an important zoonotic issue in Taiwan. Thus, the aim of this study was to investigate HEV infection in pigs, zoo animals and environmental rodents in Taiwan. Between 2006 and 2007, 17 serum samples, 136 liver samples, 102 bile samples and 104 fecal samples were collected from pig(s) in the farms (during 2006 to 2007). Samples collected from Taipei city zoo included 13 (primates) liver samples, 52 mammals' liver samples, 45 reptiles' liver samples, 34 avian liver samples and 14 liver samples from environmental rodents. HEV RNA from homogenates of the samples was detected by reverse transcriptase nested polymerase chain reaction (RT nested-PCR). HEV positive signals were detected in 7 of 134 (5.22%) liver samples, 2 of 94 (2.13%) bile samples and 7 of 72 (9.72%) fecal samples from pig(s) farms. The porcine serum samples and all liver samples from zoo animals and environmental rodents were all (HEV) negative. The highest HEV positive rate (9.65%) was (detected) in pigs of 4 to 9 weeks age, and the HEV positive rate was 6.67% and 4.26% in pigs of 9 to 16 weeks and 0 to 4 weeks age, respectively. (In addition,) no positive samples present in pigs older than 16 weeks age. The identity (homology) of nucleotide sequences of PCR products was 80.8%-93.7% homology between swine and human HEV strains in Taiwan, 84.0%-88.9% homology between genotype 4 strains from different countries, and 66.6%-68.6% and 71.8%-76.3% homology between genotype 2 and genotype 3 strains, respectively. This study confirmed that the major animal of HEV infections (HEV reservoir; HEV-infected animal) in Taiwan is pigs, and the most susceptible age is from 4 to 9 weeks. Besides, the result of sequence analysis also supports(ed) that HEV of Taiwan isolates belongs to an unique local or regional strain.

Key words: HEV, Pigs, wild animal, RT nested-PCR, local strain