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Rapid communication

Hepatitis E virus infection in wild mongooses of Okinawa, Japan: Demonstration of anti-HEV antibodies and a full-genome nucleotide sequence☆

Masaji Nakamura[a], Kazuaki Takahashi[b], Katsuya Taira[c], Masakatsu Taira[a], Atsushi Ohno[c], Hiroshi Sakugawa[d], Masahiro Arai[b], Shunji Mishiro[b,*]

[a] *Meat Hygiene Inspection Center, Pharmaceutical Affairs and Sanitation Division, Department of Health and Welfare, Okinawa 901-1202, Japan*
[b] *Department of Medical Sciences, Toshiba General Hospital, Tokyo 140-8522, Japan*
[c] *Microbiology Section, Okinawa Prefectural Institute of Health and Environment, Okinawa 901-1202, Japan*
[d] *Transfusion Section, University of the Ryukyus School of Medicine, Okinawa 903-0215, Japan*

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Abstract

Hepatitis E virus (HEV), a single-strand RNA virus, has been recovered not only from human beings but also from various species of animals. Here we report our results suggesting that mongoose should be added to the list of reservoir animals of HEV. Of 100 mongooses we examined in Okinawa, Japan, 21 were thought to be positive for anti-HEV antibodies, among which one was definitely positive for HEV RNA. Full-genome sequencing of the HEV isolate revealed that it segregates to a unique subgroup within genotype III. Interestingly, this mongoose strain was closely related to a swine isolate previously reported from Okinawa, implicating the possibility of interspecies transmission between these animals.

Keywords: Hepatitis E virus (HEV); Single-stranded RNA virus; Zoonosis; Interspecies transmission; Mongoose

1. Introduction

Hepatitis E virus (HEV), which causes acute sporadic hepatitis as well as outbreaks of so-called "water-borne hepatitis" in human beings, was isolated first from human beings [1], next from swine in the United States [2], then from rat in Nepal [3], wild boar and deer in Japan [4,5], and more recently from horse in Egypt [6]. In addition, it has been reported that other animals worldwide such as monkey, goat, cow, sheep, cat, and so on have antibodies against HEV even though viral RNA has not yet been recovered. Here, we report for the first time an HEV isolate from mongoose, a cat-like carnivore of *Herpestidae* family.

2. Materials and methods

2.1. Antibody assay

IgG class antibodies against HEV in the mongooses' sera were determined using an in-house enzyme-linked immunosorbent assay (ELISA), with some modifications of the previously reported method [7]. Briefly, the solid phase was a recombinant capsid protein of HEV, which was kindly provided by Dr. Li Tian-Cheng, and the tracer antibodies were horse radish peroxidase-labled anti-cat rabbit IgG (MP

☆ The nucleotide sequence reported in this paper will appear in DDBJ/EMBL/GenBank databases under accession number AB236320

* Corresponding author. Department of medical Sciences, Toshiba General Hospital, 6-3-22 Higashi Oh-i, Shinagawa-ku, Tokyo 140-8522, Japan. Tel.: +81 3 3764 8981; fax: +81 3 3764 8992.
E-mail address: shunji.mishiro@po.toshiba.co.jp (S. Mishiro).

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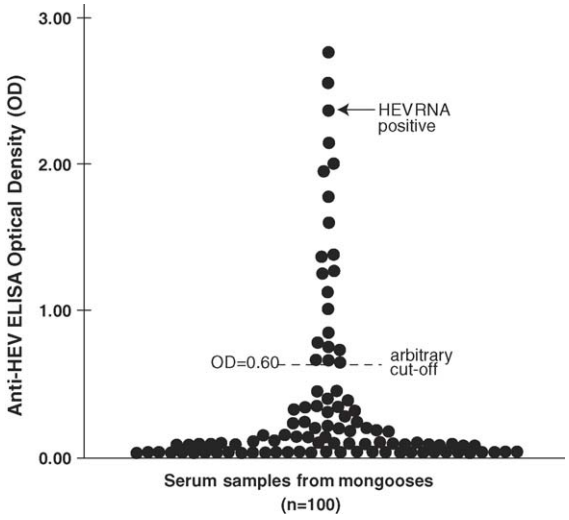

Fig. 1. IgG class antibodies against HEV determined by ELISA.

Biomedicals Inc., Ohio, USA). We used this anti-cat antibodies under the presumption that it could surrogate anti-mongoose antibodies (commercially unavailable) because mongooses and cats belong to the same *Feliodea* superfamily.

2.2. Detection and sequencing of HEV genome

Detection and nucleotide sequencing of the HEV RNA in the mongooses' sera were performed by the methods described previously [8,9]. Briefly, HEV RNA from the nucleic acids extracted from the mongoose serum was reverse-transcribed to cDNA with use of the THERMOSCRIPT RT System (Invitrogen Corporation, California, USA), and PCR amplification of several overlapping regions of the HEV genome was carried out in the presence of PLATINUM Taq DNA Polymerase High Fidelity (Invitrogen). The 5′- and 3′-terminal sequences were amplified with 5′-Full RACE Core Set (TaKaRa Shuzo Co., Ltd., Shiga, Japan) and

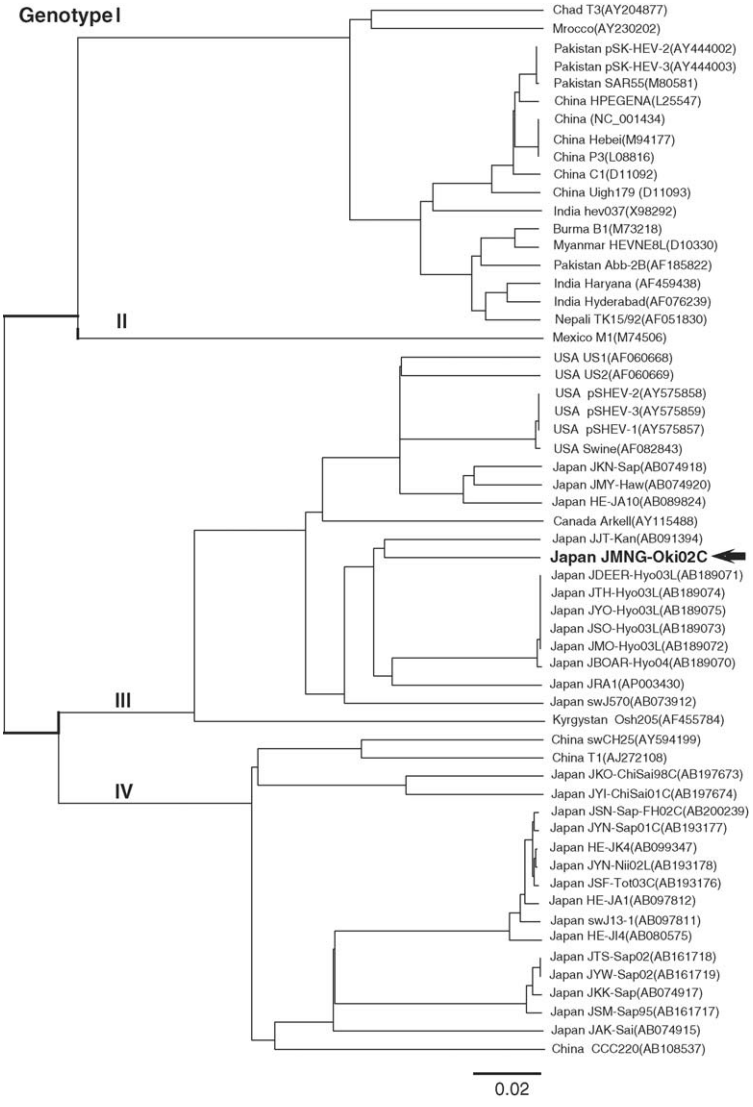

Fig. 2. Phylogenetic tree (UPGMA) based on complete or nearly complete nucleotide sequences of HEV.