CHARACTERIZING ENTEROVIRUS TRANSMISSION BETWEEN HUMANS AND PRIMATES IN BANGLADESH

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Zoonotic diseases are increasingly recognized as a risk to public health. SARS coronavirus, SIV and avian influenza are among the zoonotic viruses that have recently impacted human populations. In general, persistence of zoonotic infectious agents in human populations is uncommon, but, as in the case of HIV, viruses that successfully adapt to human hosts can cause devastating epidemics. Host similarity is thought to be an important predictor of a zoonotic pathogen’s ability to persist in human populations. Because humans are similar to nonhuman primates (NHPs) with respect to their immunology, physiology and behavior, infectious agents enzootic in NHPs may adapt more easily to humans. Human/NHP interaction is common in South and Southeast Asia, where humans and primates have coexisted sympatrically for centuries. Enteroviruses are a subgroup of the picornavirus family that in humans are associated with febrile rash, respiratory illness, and acute febrile illness. Researchers in the 1950’s, 60’s and 70’s catalogued several strains of enterovirus from NHP populations in South Asia. Ongoing research at the Centers for Disease Control and Prevention (CDC), as part of the World Health Organization's surveillance for acute flaccid paralysis (AFP) has identified several enterovirus strains from humans in Bangladesh that closely resemble simian enteroviruses characterized decades ago. These results suggest the possibility that the human EV76, EV89, EV90, and EV91 strains may have resulted from zoonotic transmission of viruses originating in the NHP population of Bangladesh. During our January 2007 field season in Bangladesh 75 fecal samples from 6 of the country's 10 taxa of primates (rhesus macaque, pig-tailed macaque, Hoolock gibbon, capped langur, golden langur, slow loris) were collected and sent to our collaborators at the CDC's Polio & Picornavirus Branch. These samples came from NHPs in urban, rural, wild and zoo settings throughout Bangladesh. Fecal specimens were tested for the presence of enteric picornaviruses using sensitive PCR assays. Enteroviruses EV75, EV90, and EV97 were identified in rhesus macaques (one animal each). Each of these viruses has been previously detected in children with acute flaccid paralysis in Bangladesh, during routine poliomyelitis surveillance activities. However, a causative link to paralysis has not been established. These results indicate that enteroviruses may be transmitted between humans and NHPs in Bangladesh, but the directionality of transmission is unknown.