Commentary

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# Outspread of Virus in Animal Host Causing Epizootics

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## Description

The unexpected appearance of new viruses, such as Marburg virus and Lass virus, which have caused outbreaks in the sixties of the last century with an at that time completely unknown, extreme rate of fatalities has motivated Joshua Lederberg to coin the term of “emerging infections”. This term describes nothing but a phenomenon. Since that time, a great number of “new” zoonotic agents have emerged, not only viruses but also bacteria and even protozoa. However, in each of these examples, the circumstances and reasons of emergence are different.

In some cases, viruses have established themselves in the human host so successfully that epidemics and epizootics can proceed independently of each other. In such cases, the classification as a zoonosis is justified if a host change from an animal to a human host can be proven. Examples are the influenza A viruses and the rotaviruses. Both viruses are widespread in animal host and cause epizootics that do not necessarily lead to epidemic spread. Influenza A viruses and rotaviruses have segmented genomes that allow genetic exchange by reassortment. New variants, differing from the original virus in respect to host to host range, pathogenicity, and contagiosity may result from genetic recombination. In hepatitis E, there is also coexistence of epidemic and epizootic spread. In this case, it has been shown that among the four viral subtypes, strains 1 and 2 cause epidemics that are spread via the fecal-oral route. Strains 3 and 4 are causing zoonotic infections that are not transmitted by human to human contacts.

The causal agents of AIDS, the human immunodeficiency viruses, have switched to epidemic spread in a short period of time. However, even in this case, the zoonotic origin is indisputable as HIV I and HIV II exhibit a close relationship with immunodeficiency viruses occurring in monkeys and sporadic transmission of the simian viruses to human happens. HIV I is closely related to SIV-cpz, a chimpanzee virus, HIV II is most probably derived from a virus that persists in mangabeys. Genetic analyses have shown that HIV I was transferred at a minimum of four different occasions from chimpanzees or gorillas to humans.

Narrow relatives exist in the animal kingdom of TT virus, a newly discovered parvovirus, which is transferred between humans via blood transfusions. A human infections result from contact with infected people, and not from animal contacts, we do not speak of a zoonosis. Foamy agent is a simian retrovirus that is transmitted to people working or living in close contact with monkeys but apparently does not cause disease. This virus does not meet the definition of a zoonotic virus. Borna-virus, a horse virus belonging to the Nega-virals, is highly pathogenic for horses. Antibodies against Borna are also found in the human population, mainly in psychiatric patients. The meaning is unclear. As all viral isolates obtained from human specimens agree in their genomic base sequence and do not differ from the laboratory strain, there is no convincing proof that these viruses are transferred from animals to humans. Newer findings about a murine retrovirus, XMRV, which is supposed to be transferred with blood donations, are based on serological evidence that has not been confirmed by other investigators.