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Beneath the Surface: Pig as unseen carriers of Rat Hepatitis Virus and their impact on human health

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Global public health remains severely challenged by the advent of zoonotic diseases, especially in light of the constantly changing landscape of viral infections. The rat hepatitis virus (RHV), which mostly affects rodent populations, especially rats, is one such worry. According to recent research, pigs may act as RHV transmission vectors, which raises serious concern about its implications for human health. The possible function of pig as RHV vectors, the health hazards connected with it, and the pressing need for preventive actions are all covered in this viewpoint. RHV is a member of the family Hepadnaviridae, which also includes the human hepatitis B virus (HBV), a subject of extensive research. RHV is thought to lead to liver dysfunction and generates symptoms similar to hepatitis in both domestic and wild rat populations¹. Despite not directly endangering human like HBV does, RHV's close link with HBV raises questions about the virus's ability to adapt and infect new hosts. Addressing RHV's possible hazard to human and animal health requires an understanding of its biology and transmission dynamics².

Studies reveal that pigs are often raised in environments where they are in close proximity to rodent populations, especially in agricultural contexts. There are potential risks for cross-species transmission because of this close proximity. These interactions might help RHV adapt among swine populations, which could result in the creation of novel virus strains³. The physiological similarities between pigs and rodents may also favour the multiplication and longevity of RHV in pig, providing a conduit for the virus to spill over into other species, including human. A significant element raising the possibility of RHV transmission via pig is the inadequate biosecurity protocols on a large number of farms. The habitats of rats and pig significantly overlap as a result of routinely inadequate rodent control and biosecurity measures⁴. The agricultural sector must recognize the potential for viral spillover and take proactive steps to mitigate the associated risks. The zoonotic potential of RHV via pig is especially worrying. If RHV adapts to infect human, it could result in new hepatitis strains that can cause disease⁵. Given the genetic diversity of hepatitis viruses, such recombination events may result in more virulent or transmissible versions of the virus, complicating treatment of hepatitis infections in human. In addition to the dangers of novel strain introduction, food safety is also a major concern. Consuming undercooked or infected pork products may transmit RHV to human⁶. A significant proportion of the global population consumes pork, and ensuring the safety of pork products is crucial to preventing potential zoonotic transmissions. With increasing reports of foodborne illnesses linked to various pathogens, the implications of RHV transmission through the food supply cannot be overlooked⁷. This situation highlights the importance of adhering to strict food safety practices, including proper cooking and handling of pork products, to mitigate risks⁸.

To address the growing concerns about RHV transmission from pig to human beings, a number of techniques must be implemented. To better understand the transmission patterns of

RHV in pig herds, there is an urgent need for further research and surveillance⁹. Monitoring RHV prevalence in rats and pig will be essential in determining hotspots for possible transmission. Understanding the genetic makeup of RHV strains found in various species will also be critical for determining the likelihood of zoonotic transmission. Second, improving biosecurity on farms is critical. Regular rodent control, efficient waste management, and safe housing can considerably lower the probability of pig-rodent interactions¹⁰. These measures can help safeguard both animal and human health. Farmers and agricultural stakeholders should be educated on best practices for biosecurity to minimize the risk of disease transmission¹¹.

Education and public awareness campaigns about the dangers of RHV as well as the significance of safe food handling and cooking techniques are essential¹². One important way to stop the spread of RHV is to educate farmers, food handlers, and consumers about the possible risks of zoonotic illnesses. Education initiatives that are specifically targeted can increase knowledge about the symptoms of rodent infestations, the significance of food safety, and the necessity of routine health examinations for livestock¹³. Finally, adopting an integrated One Health approach is essential. This multidisciplinary strategy emphasizes the interconnectedness of human, animal, and environmental health. Collaboration among veterinarians, public health officials, and environmental scientists will enhance our understanding of zoonotic diseases like RHV¹⁴. Through this approach, we can better manage the risks posed by zoonotic diseases and develop effective prevention and control strategies.

In conclusion, there are a lot of obstacles facing public health since pig may act as rat hepatitis virus vectors. In order to reduce the hazards connected with RHV, it is essential to comprehend the transmission dynamics and put preventive measures in place. Sustained

investigation, monitoring, and public awareness campaigns are required to safeguard human well-being and stop the spread of novel hepatitis viruses. By tackling these problems in concert with One Health, we can more effectively control the threats posed by zoonotic diseases in a globalized society.

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