**Introduction**

Hantaviruses have been around for hundreds of years, but did not gain world recognition until the Korean War when over 3,000 troops were infected with a five to ten percent mortality rate. 2 With many of the victims having died from the Hantavirus genus, a high mortality rate the fact that they are only transmitted by a rodent reservoir has been the human population’s saving grace. 2,3 The 1995 discovery of the Andes virus species of Hantavirus in Southern Argentina changed that simple blessing and made Hantavirus a lethal threat not only from the rodent reservoir but from person to person as well. This startling discovery has been verified through epidemiological and molecular tests. 4 So far the Hantavirus capability to transmit from person to person has been extremely low, but the Andes virus species and the Southern American region, but this may not always be the case. Just as the Hantaviruses evolve and acquires attributes that increases its threat to the human population so will other viruses around the world.

**Methods**

An Analysis was conducted on a South American Hantavirus with an unusually high mortality rate that is capable of person to person transmission. Epidemiological and molecular evidence for this route of transmission were examined and lead to conclusions as to the potential of this pathogen for the future. Reference materials included official CDC publications, peer-reviewed journal articles, published literature on Hantaviruses and microbiology textbooks.

**Hantavirus**

The numerous species that make up the Hantavirus genus are divided into Old World and New World groups. Old World Hantaviruses have been recognized the longest and are found mostly in Europe and Asia. They cause Hantavirus Disease (HVD), formerly known as Hemorrhagic Fever with Renal Syndrome (HFRS). More recently Hantaviruses were discovered to produce a respiratory illness called Hantavirus Pulmonary Syndrome (HPS) (Table 1). This disease has existed since 1959, but did not come to light until the outbreak of the Sin Nombre Hantavirus in the four counties area of the southwestern United States. 2 The incubation period after exposure to infected rodent urine or feces for both HVD and HPS are not determined, but are estimated range from one to five weeks. 3 Currently, there is no treatment or vaccine for Hantavirus infections. Supportive care such as oxygen therapy given may be the best chance at recovery. 4

<table>
<thead>
<tr>
<th>Feature</th>
<th>HFRS</th>
<th>HPS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Major target organ:</td>
<td>Kidney, Lung</td>
<td></td>
</tr>
<tr>
<td>First phase</td>
<td>Febrile</td>
<td></td>
</tr>
<tr>
<td>Second phase</td>
<td>Shock, Shock, pulmonary edema</td>
<td></td>
</tr>
<tr>
<td>Oliguria, diuresis, convalescence</td>
<td>Diuresis, convalescence</td>
<td></td>
</tr>
<tr>
<td>Mortality</td>
<td>1-15%</td>
<td>50%</td>
</tr>
</tbody>
</table>

Table 1. Comparison of Hemorrhagic Fever with Renal Syndrome (HFRS) and Hantavirus Pulmonary Syndrome (HPS)

**Andes Virus**

The Andes virus was first discovered in southern Argentina in 1995 shortly after the Sin Nombre Hantavirus outbreak in the four counties region of the United States. 2 Andes virus still maintains a rodent reservoir like other Hantavirus genus members (Figure 1). 1 However, until the Andes virus was discovered no Hantavirus had ever been recognized as transmissible between humans. 2 The different routes of transmission are depicted in Figure 1.

**Evidence for Person to Person Transmission**

Clusters of Hantavirus Infection in Southern Argentina

A study of eight clusters of Hantavirus infections in Southern Argentina analyzed exposures routes and incubation periods to identify cases of person to person transmission of Hantavirus (Figure 2a). 2 The type B clusters all had an incubation period ranging from about two to three weeks, which would not have been possible if the secondary cases had contracted the virus through the same natural exposure as the index case because its incubation period would have then fallen outside of the acceptable window for Hantaviruses (Figure 2b). 2

**Discussion**

The reason or attribute that allowed Andes virus to develop the ability to transmit from person to person is still unknown. Researchers have the opportunity to study a virus on the ground floor of acquiring an ability that poses a serious threat to the human population. Rather than creating a scenario where a deadly virus spreads easily among humans in the laboratory, which has caused quite a controversy with the H5N1 influenza virus, scientists could take advantage of what nature has already created in the Hantavirus genus. 5 By studying the transition of Hantaviruses and H5N1 from being only transmissible from rodent and bird vectors to being able to spread from human to human will serve as a probe for viruses on the verge of obtaining this same capability in the future.

**Conclusion**

The discovery of a Hantavirus capable of transmitting from person to person was unexpected and quite frightening as it came on the heels of the Sin Nombre Hantavirus outbreak in the United States. Resistance to this route of transmission conclusion was refuted with multiple epidemiological studies and molecular evidence. However, these studies have only scratched the surface of how the Andes virus acquired its ability and its mechanism of operation, which could play a key role in the prevention and treatment of other deadly viruses on the verge of being able to transmit freely between humans in the future.

**References**