

HANTAVIRUS PULMONARY SYNDROME IN ARGENTINA

POSSIBILITY OF PERSON TO PERSON TRANSMISSION

DELIA ENRIA¹, PAULA PADULA², ELSA L. SEGURA², NOEMI PINI, ALEXIS EDELSTEIN²,
CLARA RIVA POSSE³, MERCEDES C. WEISSENBACHER⁴

¹Instituto Nacional de Enfermedades Virales Humanas Dr. Julio I. Maiztegui, Pergamino; ²Instituto Nacional de Microbiología Dr. Carlos G. Malbrán, Buenos Aires; ³Departamento de Enfermedades Prevalentes, Ministerio de Salud y Acción Social, Buenos Aires; ⁴Programa Conjunto de las Naciones Unidas sobre el SIDA, Montevideo, Uruguay

Summary In March 1995 the first case of a familiar outbreak of Hantavirus pulmonary syndrome (HPS) was notified in El Bolsón, in the South of Argentina. Until December 15, 1996, a total of 77 cases of HPS had been notified with 48% mortality, distributed in three geographical areas of the country, South, North and Center. During 1996, of the 19 cases from El Bolsón, three were local physicians, one of whom—during the prodrome of her illness—travelled to Buenos Aires to be attended. In the hospital, two of the physicians who assisted her, developed HPS 27 and 28 days after the first contact. These data suggest for the first time the possibility of interhuman transmission of the Hantavirus responsible for the pulmonary syndrome.

Key words: Hantavirus, Hantavirus pulmonary syndrome, Hantavirus transmission

Up to 1993, hemorrhagic fever with renal syndrome (HFRS) was the only known disease caused by hantaviruses and was restricted to Asia and Europe¹. That year, a new clinical entity emerged in the Americas (United States). The disease was characterized by a severe acute respiratory insufficiency, and its etiological agent was identified as a new Hantavirus, that was named *Sin Nombre Virus*. Hantavirus pulmonary syndrome (HPS) is a viral zoonosis, and it is transmitted to humans by inhalation of excreta of infected rodents. Person-to-person transmission has never been documented so far².

In Argentina, infection of wild and laboratory rodents as well as subclinical human infections were reported between 1983 and 1987³⁻⁵. Clinical cases presenting both as HFRS and HPS were retrospectively diagnosed between 1987 and 1993⁶.

In March 1995, the first case of a familiar outbreak of HPS was notified in El Bolsón city, Rio Negro province, in the Argentine Southern Andes⁶. From the lung and liver of one of the cases who died, a new Hantavirus named Andes was identified by a polymerase chain reaction (RT) PCR⁷.

Up to December 15, 1996, a total of 77 cases of HPS have been notified in Argentina, with 37 deaths (case-fatality rate: 48%). All cases had the clinical characteristics of HPS, but renal involvement and hemorrhagic manifestations were also observed in some patients. All notified cases had etiologic laboratory confirmation, either by ELISA detection of IgM, serologic conversion or specific PCR.

Received: 16-XII-1996

Accepted: 26-XII-1996

Postal address: Dra. Elsa Segura, Administración Nacional de Laboratorios e Institutos de Salud (ANLIS) Dr. Carlos G. Malbrán, Avda. Vélez Sarsfield 563, 1281 Buenos Aires, Argentina.

HPS patients were distributed in three areas of the country. In the North, in Orán, Salta province, between 1991 and 1996, 32 cases with 13 deaths occurred. In the central area of the country (Santa Fe and Buenos Aires provinces), nine cases (five deaths) were detected between 1993 and 1996. In the South, in the localities of El Bolsón, Bariloche and Esquel, belonging to Río Negro and Chubut provinces, 34 cases (18 deaths) were notified between 1992 and 1996. In this enumeration by geographic area, two patients are not included; both were health professionals with residence in Buenos Aires city; they developed HPS that, due to the special characteristics of their risk, will be analyzed separately.

In 1996, from the 19 cases notified in El Bolsón area, 18 occurred during the three months of spring (September to December). All cases from this outbreak were permanent residents or had temporarily visited the endemic area in the two to five weeks previous to the day of admission to the hospital.

Three cases of this epidemic outbreak were physicians who lived in the zone. One of them died (A), the second survived (B), and the third physician (C, wife of A) when symptoms appeared traveled to Buenos Aires to be treated there. In the emergency unit of a hospital in Buenos Aires, during the process of arterial bleeding from C, doctor D suffered an accidental exposition to the blood of the patient, without cuts or wounds. Blood from patient C entered into contact with the hands—without gloves—of doctor D. Hours later, C was transferred to the intensive care unit. Another doctor (E) took care of C during the two weeks of her illness. Doctors D and E developed HPS 27 and 28 days, respectively, after the first contact with doctor C in the hospital.

Doctor E, who died, had been a friend of C and presented two known risk factors. The first risk factor was a visit to El Bolson performed during the burial of A, husband of C, 50 days previous to her admission with HPS; the second risk factor was looking after C three to four hours daily during her hospitalization in Buenos Aires, between 28 and 14 days previous to her own admission.

Doctor D, who recovered from HPS, had never visited the endemic area. His only known risk factor was an accidental contact with the blood of patient C, as mentioned above, 27 days previously to his own admission to the hospital, with HPS.

In the El Bolson outbreak, there had been several cases of HPS in persons who had shared the same house, as well as three cases of doctors (A, B and C) who lived in the endemic area, and who also had assisted patients with HPS. Although the suspicion of interhuman transmission of the Hantavirus causing HPS in El Bolson area was considered, it could not be demonstrated either in the family setting or under intimate contact, or in health professionals while giving care to patients either in the family setting or in the hospital. This was due to the fact that in all cases registered in El Bolson epidemic outbreak, infection from rodents could not be ruled out because the patients lived or had visited the endemic area in a period that was coincident with the incubation period of the disease.

It should be noted that no cases of HPS due to interhuman transmission or nosocomial infection have been notified until now. We are reporting for the first time evidence which suggests that health personnel could acquire the infection from patients with HPS.

A more direct evidence of the chain of transmission and the ways of infection will be obtained from the epidemiologic investigation and from molecular tests performed on the virus isolates, now under way.

Taking into consideration the possibility of nosocomial transmission of an infectious disease with a high case-fatality rate, and in many aspects still scarcely known, universal biosafety measures and precautions to reduce the exposition of health personnel to HPS should be maximized.

Early clinical and etiological diagnosis would facilitate these measures, not only in the hospital setting but also among the patients' family and contacts.

Meanwhile, the characteristics of the hanta-viruses causing HPS in Argentina, specifically those related to their virulence and transmissibility should be carefully investigated. Advances in the understanding of the mechanism of transmission will lead to the development of practical and effective interventions which may reduce the risk of Hantavirus infection.

Acknowledgements: We are grateful for the collaboration of the physicians involved in the assistance of HPS patients: Dres M.E. Lázaro (Hospital Zonal Bariloche), A.M. Resa (Hospital de El Bolsón), L. Clara (Hospital Italiano de Buenos Aires), E. Argüello

(Fundación Favaloro), O. Barclay (Clínica San Carlos de Bariloche), J. Cortés (Hospital Zonal de Orán), L. Bogni (Hospital de Esquel), M. Del Castillo y D. Lasala (Hospital de Clínicas José de San Martín).

Resumen

Síndrome pulmonar por Hantavirus en la Argentina. Posibilidad de transmisión de persona a persona

En marzo de 1995 se notificó el primer caso de un brote familiar del síndrome pulmonar por Hantavirus (HPS) en El Bolsón, en el sur de la Argentina. Hasta el 15 de diciembre de 1996 se habían notificado un total de 77 casos de HPS con un 48% de mortalidad, distribuidos en tres áreas geográficas del país, sur, norte y centro. Durante 1996, de los 19 casos en El Bolsón, tres fueron médicos de la zona, uno de los cuales en los prodromos de su enfermedad viajó a Buenos Aires para ser atendida. Entre los médicos en contacto con ella en el hospital, dos desarrollaron HPS a los 27 y 28 días del primer contacto. Estas observaciones sugieren –por primera vez– la posibilidad de transmisión interhumana del

Hantavirus responsable del síndrome pulmonar.

References

1. World Health Organization. Haemorrhagic fever with renal syndrome: Memorandum from a WHO meeting. *Bull WHO* 1983; 61: 269-75.
2. Khan AS, Ksiazek TG, Peters CJ. Hantavirus pulmonary syndrome, *Lancet* 1996; 347: 739-41.
3. LeDuc JW, Smith GA, Pinheiro FP, Vasconcelos PFC, Rosa EST, Maiztegui JI. Isolation of Hantaan-related virus from Brazilian rats and serologic evidence of its widespread distribution in South America. *Am J Trop Med Hyg* 1985; 34: 810-5.
4. Weissenbacher MC, Merani MS, Hodara VL, et al. Hantavirus infection in Laboratory and wild rodents in Argentina, *Medicina (Buenos Aires)* 1990; 50: 43-6.
5. Weissenbacher MC, Cura E, Segura EL, Hortal M, Baek LJ, Chu YD, Lee HW. Serological evidence of human Hantavirus infection in Argentina, Bolivia and Uruguay, *Medicina (Buenos Aires)* 1996; 56: 17-22.
6. Parisi MN, Enria DA, Pini NC, Sabatini MS. Detección retrospectiva de infecciones clínicas por Hantavirus en la Argentina, *Medicina (Buenos Aires)* 1996; 56: 1-13.
7. López N, Padula P, Rossi C, Lázaro ME, Franze-Fernández MT. Genetic identification of a new Hantavirus causing severe pulmonary syndrome in Argentina. *Virology* 1996; 220: 223-6.

Although virologists cannot yet predict specific disease outbreaks, we now understand many of the factors leading to them. And because we have a better grasp of their origins, for the first time we are in a position to do something about emerging diseases at fairly early stages.

Aunque los virólogos no pueden aun predecir las epidemias de algunas enfermedades específicas, ahora comprendemos muchos de los factores que conducen a ellas. Y porque tenemos un mejor dominio de sus orígenes, por primera vez estamos en posición de combatir las enfermedades emergentes en sus estadios muy tempranos.

Steve Morse

in *A dancing matrix* by Robin Marantz Henig. New York: Vintage Books, 1993