

## Human Rabies in Israel

Michael Gdalevich MD, MPH<sup>1,2</sup>, Daniel Mimouni MD<sup>1</sup>, Isaac Ashkenazi MD<sup>1,2</sup> and Joshua Shemer MD<sup>2,3</sup>

<sup>1</sup>Israel Defense Forces Medical Corps, <sup>2</sup>Sackler Faculty of Medicine, Tel Aviv University, and <sup>3</sup>Israel Center for Technology Assessment in Health Care, Gertner Institute for Epidemiology and Health Policy Research, Tel-Hashomer, Israel

**Key words:** rabies, pre-exposure prophylaxis, postexposure prophylaxis, human rabies immune globulin, human diploid cell vaccine

*IMAJ 1999;1:57-58*

Prevention of rabies is based on the pre-exposure vaccination of populations at risk (e.g., veterinarians and gamekeepers) and postexposure prophylaxis of persons bitten by possibly sick animals. The postexposure measures include passive immunization with human rabies immune globulin, as well as administration of active human diploid cell vaccine [1,2]. The combination of these methods with control of animal rabies has led to a significant decrease in human morbidity in developed countries. In Israel, the joint efforts of public health authorities and the veterinary service have resulted in effective control of the disease, with, consequently, only two new human cases occurring between 1958 and 1960 [3,4] and none since 1960 until 1996. Animal morbidity, however, has remained a problem, with an increase in the numbers of annually diagnosed cases and a subsequent increase in the incidence of human exposure [5]. The single case that occurred in 1996 is described here.

### Case Description

In October 1996 in the Golan Heights area, a 20-year-old male soldier was bitten on the lower lip while asleep in a tent. No positive identification of the injuring animal could be made, except that its size, 20–30 cm, was noted. A few hours later the wound was examined by a medic, who referred the soldier to the nearest hospital emergency ward. There the wound was thoroughly washed and sutured. The question as to the need for rabies post-exposure prophylaxis was addressed at the district health department, where the physician in charge reached the conclusion that the soldier had been bitten by a rat or a mouse and

therefore no postexposure treatment was required.

Thirty-seven days later the soldier complained of fever, headache and nausea. He was referred to a local military hospitalization facility and was released after 2 days with the diagnosis of viral infection. Two days later he was admitted to the neurology department of the regional hospital because of confusion, visual and auditory hallucinations, and outbreaks of anger. He had difficulty swallowing, which got progressively worse. Other findings on admission included fever of 39°C, tachycardia, tachypnea, and a diffuse macular rash on the chest and back. A neurological assessment revealed interchanging periods of cognizance and sleepiness, hallucinations accompanied by agitation, and dysphagia and dysarthria. There were no signs of meningeal irritation. An extensor plantar reflex was noted on the left side. Laboratory evaluation showed mild leukocytosis (13,200  $\mu$ l) with 85% polymorphonuclear cells. Findings of liver function tests, ECG, chest X-ray and brain computed tomography were normal. Successive electroencephalogram tests revealed general slowing of electric activity. The diagnosis of acute encephalomyelitis was reached, with differential diagnosis including rabies (as a leading possibility due to the history of exposure), herpes or other viral encephalitis, lymphocytic choriomeningitis, brucellosis, and subacute sclerosing panencephalitis. According to these possibilities, the treatment included high doses of HRIG<sup>8</sup>, intramuscular  $\alpha$ -interferon and intravenous acyclovir, ofloxacin and doxylin. In addition, serum, cerebrospinal fluid, saliva, cor-

neal scraping and a skin biopsy were sent to the central veterinary laboratory in Israel and to the Institute Pasteur in Paris. The results of antibody tests were found to be negative both in serum and CSF; and immunofluorescent rabies antibody staining of skin biopsies was positive. Lyssavirus — a rabies virus type isolated mostly from terrestrial mammals [1] — was identified by polymerase chain reaction for rabies viral RNA.

The condition of the patient progressively deteriorated. In addition to urinary retention and paralytic ileus, he developed progressive weakness and flaccidity of all four limbs. Artificial respiration was administered in the intensive care unit. After a total of 33 days of hospitalization, with the continued deterioration of his general condition and a worsening of his neurological status, the patient died. The postmortem examination revealed large areas of necrosis in the cerebellum and the brainstem with diffuse neuronal degeneration; necrotic foci in the spine; and injuries to the spleen, liver, kidneys, adrenals, gall bladder and intestines.

### Comment

What could have been done to prevent this outcome? The most effective prevention is immediate and thorough cleaning of the bite wound with soap or detergent [1,2]. This procedure should have been performed at an earlier stage after the bite. With regard to postexposure prophylaxis, we believe it was mandatory in this case for two reasons — the exposure occurred in a rabies-ridden area, and the identification of the injuring animal was uncertain.

<sup>8</sup>HRIG = human rabies immune globulin

**Acknowledgments:** The authors thank the staff of the neurology department of the Hillel Yaffe Hospital and the ICU of the Sheba Medical Center for their devoted treatment of the soldier. Our deep appreciation to Dr. D. David from the Veterinary Services Central Laboratory and Dr. N. Keller for their help in obtaining diagnostic results.

## References

1. Fishbein DB, Bernard KW. Rabies virus. In: Mandell GL, Douglas RJ, Bennett JE, eds. Principles and Practice of Infectious Diseases. 4th ed. New York: Churchill-Livingston Publishers, 1995:1527–43.
2. Rabies. In: Benenson AS, ed. Control of Communicable Diseases Manual. 16th ed. Washington, *Am Pub Health Assoc* 1995:382–90.
3. Israel Central Bureau of Statistics. Annual report, Jerusalem. 1996.
4. Shimshoni A. Rabies. Bulletin of the Israel Veterinary Services. Beit Dagan 3.12.1996.
5. Mimouni D, Gdalevich M, Ashkenazi I. Rabies — re-emerging threat. *Harefuah* 1997;132:733–5 (in Hebrew).

---

**Correspondence:** Dr. M. Gdalevich, 8/4 Pinskyer St., Rehovot, Israel. Tel: (972-8) 931 6284, (8) 941 9417; Fax: (972-3) 547 5193; email: drlena@netvision.net.il