



ORIGINAL ARTICLE

Epidemiologic Features of Animal Bite Cases Occurring in Rabies-Endemic Areas of Korea, 2005 to 2009

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Abstract

Objectives: Human rabies is a reemerging infectious disease in Korea. There was no human rabies case for 14 years until the disease had reoccurred in 1999. To prevent occurrence of human rabies, surveillance for animal bite patients in rabies endemic areas in Korea was conducted since 2005 as a part of a human rabies control program. The animal bite cases were analyzed to determine whether patients were treated according to the post-exposure prophylaxis (PEP) guideline of the Korea Centers for Disease Control and Prevention.

Methods: Information of animal bite cases that occurred from 2005 to 2009 in rabies high-risk regions were collected by cooperation with Regional Public Health Centers in 18 cities/districts of rabies endemic areas.

Results: A total of 2458 animal bite cases were reported. Dogs accounted for 86% of animal bites and 67% of the animals were not vaccinated against rabies virus. For PEP, among rabies-vaccinated animals, 92.7% were observed for clinical signs and 1.4% underwent necropsy. Among unvaccinated animals, 72.7% were observed for clinical signs and 4.1% underwent necropsy. The remaining animals were not available for examination. Of the animal bite patients, 32.5% received PEP and 51.6% were treated by first aid or by washing the wound.

Conclusions: Given that no human rabies cases were reported since 2005 and animal rabies was continuously reported in endemic areas of Korea, the human rabies control program implemented in 2005 appears to have a significant role in the prevention and control of human rabies.

1. Introduction

Rabies is a representative zoonosis and a reemerging disease in Korea. In Korea, the raccoon dog (*Nyctereutes procyonoides*) is a principal natural

reservoir of rabies virus, but dogs are a predominant animal for transmission. There were no human cases of rabies from 1985 to 1998, but the disease reoccurred in 1999, following a new case of animal rabies in 1993 [1,2].

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Human rabies can be prevented by avoiding bite of rabid animals, pre-exposure vaccination or post-exposure prophylaxis (PEP). The guidelines for Human Rabies Prevention and Control (HRPC) by Korea Centers for Disease Control and Prevention (KCDC) recommends PEP based on the anatomical locations of the bite, animal species, wound status, and rabies vaccination history of the animal [3]. Patients who acquired bites that were applicable to World Health Organization (WHO) Categories II and III in high-risk regions should immediately receive PEP, and animals should be observed for clinical signs or be examined for rabies diagnosis [5]. According to the KCDC rabies guidelines, PEP should be completed by administering vaccine on Days 0, 3, 7, 14 and 28, with human rabies immune globulin (HRIG) on Day 0. Equine rabies immunoglobulin is not permitted to use for animal bite patients in Korea. If no clinical signs of rabies in an animal were observed within 10 days or if an animal was negative for rabies diagnosis by molecular and histopathological examinations, the remainder of PEP is not necessary. Alternatively, for animal bites that occur nationwide, including the suspect-risk regions, animals should be observed for clinical signs for 10 days. If animals are clinically normal, PEP is not necessary. However, if abnormal clinical signs are observed, PEP is required, and the animal should be considered for rabies diagnosis. If no animal is available for rabies examination or if the bite is caused by a wild animal regardless of geographical location, PEP should be administered to a patient immediately.

Due to expanding regions of animal rabies outbreaks and to increasing public health threats, the National

Animal Bite Patient Surveillance (NABPS) program was implemented in 2005 by guidelines of the HRCPC to prevent human rabies. The NABPS was performed in close cooperation with KCDC, the Regional Public Health Centers (RPHC), and two Provincial Veterinary Service Laboratories in the rabies endemic areas. High-risk and suspect-risk regions were designated by guidelines of the HRCPC. Animal bite patients in the high-risk region report to RPHC and are received a proper measurement including PEP.

In this study, we analyzed animal bite cases from the high-risk region from 2005 to 2009 to determine the current status of animal bites and to determine whether patients were properly treated. We also discuss risk factors of rabies in the high-risk region and conclude that NABPS contributed to human rabies prevention since 2005, although animal rabies, including wildlife, has continuously been reported in the high-risk region.

2. Materials and Methods

The risk areas of rabies were divided into high-risk and suspect-risk regions according to the KCDC guideline of the HRCPC (Figure 1) [4]. The cities/districts where human or animal rabies had occurred since 1993 are designated as high-risk regions. Cities/districts which are adjacent with the high-risk regions are assigned to suspect-risk regions. There are nineteen and 14 cities/districts in the high-risk region and in the suspect-risk region, respectively. Two cities/districts were switched to the high-risk region from suspect-risk region in 2005 due to the occurrence of rabies in

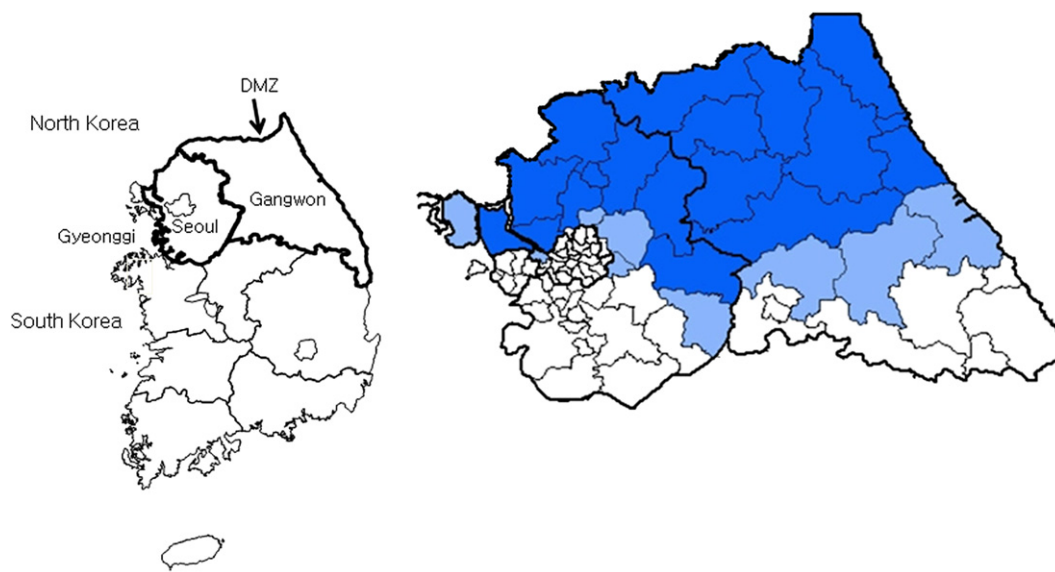


Figure 1. High-risk and suspect-risk regions of human rabies in Korea. The cities/districts where human or animal rabies had occurred since 1993 are designated as high-risk regions. The regions are located in the northern part of Gyeonggi and Gangwon provinces and are surrounded by the Han River, an expressway, the East Sea and the demilitarized zone. High-risk and suspect-risk regions are indicated in blue and light blue, respectively.

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