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ORIGINAL ARTICLES

Outbreak report

AN IMPORTED CASE OF CANINE RABIES IN AQUITAINE: INVESTIGATION AND MANAGEMENT OF THE CONTACTS AT RISK, AUGUST 2004-MARCH 2005

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In August 2004, a case of rabies was diagnosed in a puppy that had been illegally imported from Morocco to Bordeaux (France). Because a great number of people and animals were thought to have come into contact with the puppy, extensive tracing measures were implemented, and an international alert was launched to trace and treat the contacts at risk. One hundred and eighty seven people received post-exposure treatment, eight of whom also received serovaccination, and 57 animals known to have been exposed to the puppy were tested. Six months after the death of the rabid animal, none of the people treated showed any signs of rabies, nor was any secondary animal case reported. The management of this crisis highlights the importance of the role of a rapid alert system at European level. Strict application of sanitary control regulations is essential for animals introduced into EU countries, and all

necessary information must be made available to EU residents travelling to rabies enzootic areas.

Euro Surveill 2005;10(11): 225-5

Published online November 2005

Key Words: dog rabies, investigation, control, treatment

Introduction

On 26 August 2004, the CNNR (National Reference Centre for Rabies - Pasteur Institute) reported a case of rabies in a 4-month old puppy illegally imported from Morocco to Bordeaux in France to the French public health institute, the Institut de Veille Sanitaire (InVS). The animal, which was neither officially registered nor vaccinated, was acquired in the Moroccan region of Agadir and brought to France by car, via Spain, on 11 July 2004. After becoming aggressive on 17 August, the dog's condition rapidly deteriorated and it died on 21 August.

Rabies is a zoonosis caused by a rhabdovirus of the genus *Lyssavirus*. The disease can be transmitted to humans via biting, scratching, or licking of excoriated skin or mucosa; the incubation period typically ranges from 1 to 3 months. If untreated during this phase, rabies infection leads to fatal encephalomyelitis. France has been free of rabies in terrestrial mammals since 2001. Fox rabies, which was first recorded in France in 1968, was eliminated following an oral vaccination programme for foxes combined with increased control of stray animals [1].

An investigation was initiated by the DDASS (Departmental Health and Social Services Division) and the DDSV (Departmental Veterinary Services Division) of the relevant French districts and the CIRE (Inter-Regional Epidemiology Centre-) of the Aquitaine region, in conjunction with the health and food industry authorities, the CNNR and the InVS. The purpose of the investigation was to

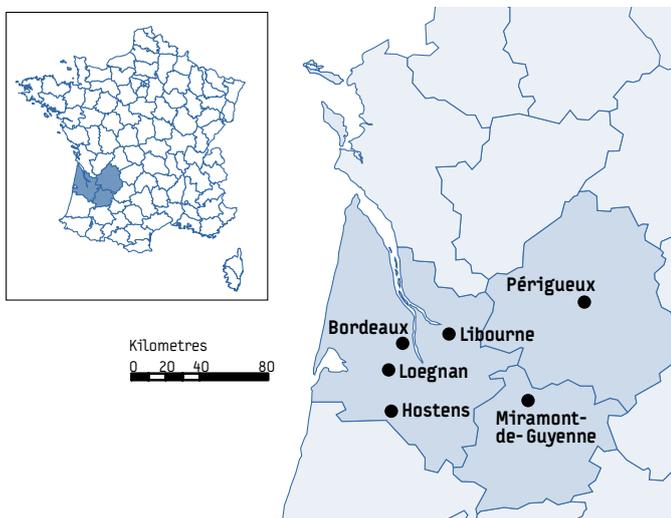
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identify all humans who had been in contact with the puppy during the communicable risk period and to refer them to a CAR (anti-rabies centre), the only structures in France empowered to diagnose rabies and administer the post-exposure vaccination. The investigation also aimed to locate all animals that had been exposed to the virus, in order to prevent rabies from being reintroduced in France.

The salivary excretion phase starts, at the earliest, 15 days before the appearance of clinical signs and lasts until death. The puppy could therefore potentially have transmitted the virus at any time between 2 and 21 August. During this period, the animal and its owner had travelled to various locations in Gironde, Dordogne and Lot-et-Garonne, and spent much time attending arts festivals. These events attract thousands of visitors from France and other European countries (FIGURE). The puppy was not constantly kept on a lead.

FIGURE

Itinerary of the rabid animal from 2 to 21 August 2004 (Imported case of canine rabies in Aquitaine, August 2004-March 2005)



Methods

Because of the great number of humans and animals possibly in contact with the puppy during the communicable risk period, the Gironde Prefect set up a crisis centre in Bordeaux from 27 August to 22 September 2004. An inter-ministerial crisis centre was also set up at the national level. These centres expedited contacts between stakeholders, helping to coordinate investigations and action plans. The centres included all parties involved at the local and the national levels.

Investigation of contacts

The owner of the puppy was questioned and his trip to Aquitaine was retraced in order to establish a list of potentially exposed humans and animals during his travels between 2-21 August 2004.

An extensive media campaign was launched in order to encourage anyone who had had contact with the puppy to get in touch with a 'Centre 15' (medical emergency service hotline) or the health authorities; and to encourage owners of pets that had come into contact with the puppy to consult a veterinarian or the local DDSV (veterinary organisation). Pictures of the puppy and the description of the possible contacts based on indications provided by the owner were regularly broadcast by the media. Posters were sent to all of the DDASS for display in public places, emergency services, Centre 15s, and the CAR.

An alert was sent to European Union (EU) member states' health authorities via the HSSDC-EWRS network, and to third countries

via the World Health Organization (WHO), to find potential contacts among citizens of other countries. The dog's description and the places visited by the dog and owner were issued. Additional information was sent to any country that requested it, and the 'decision model form' used in France to define 'contacts presenting a risk' was sent to the European Commission's Directorate-General of Health and Consumer Protection (DG-SANCO) and to the national health authorities that requested it [2]. The European health authorities and the WHO were duly notified in order to locate possible contacts living abroad [2].

A 24 hour hotline was set up in the Gironde prefecture every days until 22 September 2004, and the service then operated daily between 0800 and 1800 until 15 October 2004. Based on the initial assessment lists, individuals for whom contact was either ascertained or suspected (through biting, scratching, or licking of excoriated skin or mucosa) with any puppy that matched the description of the rabid puppy, or was compatible in time and place) were directed to a CAR. After 8 September 2004 this procedure was extended to include contacts with any carnivore that had come into contact with the puppy and then disappeared, since these animals could possibly be vectors.

Police handled questioning of witnesses and investigations to locate possibly infected humans or animals.

A national hotline was made available between 10-22 September 2004.

All medical emergency services in France reported any cases of dog bites in the Aquitaine region in August 2004 to the InVS. The CIRE and the InVS then contacted the people who had been bitten to determine whether the rabid puppy was involved.

Management of contacts

At the CAR, a risk assessment was made of all humans referred, to ascertain whether post-exposure treatment was appropriate and, if so, to determine what treatment should be prescribed (vaccine with or without rabies immunoglobulin (RIG)) in accordance with WHO recommendations [3].

The DDSV and veterinary authorities identified animals that had been in contact with the carrier.

Samples were analysed by the CNRR in cases of possible human exposure and by the LNR (National Reference Laboratory for animal rabies) in cases of possible animal exposure.

Results

Investigation of possibly infected subjects

In addition to the seven humans and two dogs within the immediate environment of the puppy, a search was initiated to locate and additional 13 people and 17 dogs, based on information provided by the owner and additional accounts by witnesses. Of these, eight people and five dogs were found.

The hotline in the Gironde prefecture received 3500 calls in 50 days; the DDASS and the DDSV in the Dordogne and Lot-et-Garonne regions received 29 and 61 calls respectively, and the national hotline received 483 calls. In all, 429 people were advised to contact a CAR. Of the people referred, 40% had no connection with the rabid animal. One hundred and sixty two calls were followed up with a veterinary investigation.

Feedback from emergency wards yielded only one person, which had already been identified by a crisis centre.

Post-exposure treatments

Post-exposure treatment for rabies was prescribed to 187 subjects, 147 (79%) of which were treated in the Bordeaux CAR. Fifty four per cent of subjects were male (the male to female ratio was 1.15).

The mean age, as derived from data available on 176 subjects, was 17 years. Ages ranged between 1 and 83 years with a median of 9 years.

The puppy was clearly identified by 29 of the treated subjects (16%). In four cases, an animal had been in contact with the puppy during the exposure risk period. Half of those treated had attended the Festival de Libourne (TABLE 1). The type of contact was undetermined in 58 cases, especially for young children (TABLE 2). In total, 8 people were bitten, 5 by the identified animal.

TABLE 1

Distribution of persons receiving post-exposure treatment according to location of contact at risk (Imported case of canine rabies in Aquitaine, August 2004-March 2005)

Place	No. of persons	%
Hostens	3	1.6
Périgueux	12	6.4
Miramont de Guyenne	34	18.2
Libourne	94	50.3
Bordeaux	39	20.8
ALL	2	1.1
Not documented	3	1.6
Total	187	100.0

TABLE 2

Distribution of persons receiving post-exposure treatment according to type of contact at risk (Imported case of canine rabies in Aquitaine, August 2004-March 2005)

Type of contact	No. of persons	%
Bite	8	4.3
Scratch	12	6.4
Licking of excoriating skin	49	26.2
Licking of mucosa	1	0.5
Licking of excoriating skin and of mucosa	5	2.7
Undetermined contact	109	58.3
Not documented	3	1.6
Total	187	100.0

A four-injection course of treatment was used for 94% of cases. One person was treated by a series of five injections followed by injection of immunoglobulin. In total, eight people were treated by serovaccination.

Veterinary laboratory

Over a period of six months more than 1200 animals, the majority of which had been found dead, were analysed in the three relevant departments in the Aquitaine region of France.

A total of 57 animals that were confirmed as having had contact with the puppy (including six from outside the Aquitaine region) were identified and analysed.

Testing found no evidence of rabies virus.

In addition, 759 stray animals that had been impounded by authorities, and that could not be identified as having escaped from their owners, or that had no evidence of having had a rabies vaccine, were monitored for a period of one year, in compliance with applicable legislation in the region.

Discussion

The last case of imported human rabies are rare with only 20 cases recorded between 1970 and 2003 [4]. At present, rabies in France is considered to be a traveller's disease, as it is in many other European countries [5]. A few human cases are regularly reported in EU rabies-free countries [6].

However, there is a risk of contracting the disease in France due to illegal importation of animals from enzootic rabies areas [7,8]. Two other cases of rabies were diagnosed in Lorient and Bordeaux in 2004, in dogs that had been illegally brought to France from Morocco, via Spain. These two cases led to the vaccination of 24 and 11 people, respectively [9,10]. A total of 22 cases of imported canine rabies have been reported in France since 1968.

In the case described here, the level of risk was thought to be significant because of the large number of humans (attendance at the festivals was estimated at 80 000) and animals potentially exposed, and due to extensive geographical scattering.

Identification of contacts at risk, in order to insure that they received appropriate care, relied on the timely transmission of information, because of the large number of non-French citizens present at the locations visited by the dog. The management of this crisis at the international level highlights the essential role of a European level rapid alert system and the need for complete transparency in the case of a threat involving member states.

At the national level, the situation was managed through close cooperation between the various organisations involved, which made it possible for a large number of potentially infected humans to be treated. Furthermore, as a consequence of this episode, a substantial increase in activity at the CAR was noted due to increased awareness regarding the risk of rabies on the part of the medical community and the general public.

In parallel with efforts to locate exposed humans and animals, control measures concerning the circulation of the domestic carnivores and stray animals were reinforced locally in the Aquitaine region for a period of six months [11-12].

Six months after the death of the rabid animal, none of the subjects treated showed any signs of rabies infection and no cases of secondary animal rabies had been declared.

The five people who were sought but not found had been described by eyewitness testimonies, and we cannot be sure either of that these people were exposed, or that they were described accurately.

The recurrence of this type of alert, underlines the necessity to control the importation of domesticated and wild animals. Health inspection regulations for animals brought into the European Union must be strictly applied [13]. Importers of domesticated carnivores originating in countries where rabies has not been eradicated must provide animal identification and proof of vaccination; animals must also test positive for rabies antibodies.

Travellers to rabies enzootic areas should be informed of the risk to public and animal health that illegal importation of animals can engender. The list of the countries at risk must be made widely available to physicians and the public.

Acknowledgements

We wish to thank everyone and all the organisations that have contributed to this investigation: the French anti-rabies centres; the French Centres 15; the crisis centre of the Gironde prefecture composed of staff from the Departmental Health and Social Services Division (DDASS) and the Departmental Veterinary Services Division (DDSV) from the Gironde department, the veterinary services of the Army, the DRASS, the CIRE Aquitaine as well as the Police and Constabulary departments; the DDASS and DDSV from Dordogne and Lot et Garonne departments; the departmental veterinary laboratories of Gironde, Dordogne and

Lot et Garonne departments; the liberal and hospital practitioners and the surveillance network of the French veterinary services; the Regional Union of liberal practitioners of the Aquitaine department. Teams of National Reference Laboratory for animal rabies and National Reference Centre for Rabies.

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ORIGINAL ARTICLES

Outbreak report

A HUMAN CASE OF TRAVEL-RELATED RABIES IN AUSTRIA, SEPTEMBER 2004

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A young male Austrian tourist, aged 23 years and unvaccinated against rabies, was bitten by a dog in Morocco in July 2004. One month later he was hospitalised in Ceuta with symptoms compatible with rabies. He died on 23 September in an Austrian hospital after a diagnosis of rabies was confirmed by FAT, IHC and RT-PCR (including sequencing) of the neck skin and the RT-PCR (including sequencing) of the pharyngeal swab. This Austrian case of laboratory confirmed rabies highlights the urgent need for reinforcement of the international recommendations for travel vaccinations.

Euro Surveill 2005;10(11): 225-6

Published online November 2005

Keywords: Austria, outbreak, rabies

Introduction: case report

Two Austrian citizens, a man aged 23 and a woman aged 21, travelled to Morocco in July 2004. The couple encountered a young dog near Agadir and continued to travel around Morocco with the dog. Soon after, the dog showed a strange and aggressive behaviour. In late July the dog attacked the woman and bit her on the right hand. The man tried to help her and was bitten on the right hand

and foot. The dog died soon afterwards and was buried without being tested for rabies. On 1 September 2004, almost one month after the dog attack, the man was admitted to hospital in Ceuta (a Spanish city situated in the north coast of Africa) after presenting with a clinical picture of excitability and confusion. The patient and his girlfriend were given anti-rabies vaccine and anti-rabies gammaglobulins. On 2 September, the patient was transferred to the intensive care unit in a coma after showing symptoms of acute encephalitis and hydrophobia. The patient's hospital records have not been made available to the medical staff who later treated the patient in Austria, and no further details about his clinical presentation are known. A message was sent via the European Union's Early Warning and Response System by the Spanish Ministry of Health after consultation with the Austrian Ministry of Health, in order to fulfil the requirements as laid down in Commission Decision 2000/57/EC [1]. The patient was evacuated to Austria by air transport and admitted to the intensive care unit of the Abt. für Infektiologie, Medizinische Universitätsklinik Graz, in Steiermark. Psychological counselling was offered to the patient's girlfriend and the family. The patient died on 23 September. His girlfriend, who was admitted to the same hospital together with the patient, did not show clinical signs of rabies and was released from hospital on Sept 17th. She completed the course of rabies vaccination on 28 October, having received vaccination on days 0, 3, 7, 14 and 28.

Methods

Fluorescent antibody testing (FAT), immunohistochemical investigation (IHC) and RT-PCR (including sequencing) were performed from punch biopsy samples of the neck skin. RT-PCR (including sequencing) was also performed from pharyngeal and

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