

MONITORING THE OUTBREAK OF LEPTOSPIROSIS AT THE ACADEMIC MEDICAL OFFICE OF THE UNIVERSITY OF AGRICULTURAL SCIENCES AND VETERINARY MEDICINE (USAMV) IN CLUJ-NAPOCA

Nicoleta Ancuța Pinteală¹, Simina Baciu¹, Gabriela Marc²

¹University medical office, Cluj-Napoca

²Registered nurse, University medical office, Cluj-Napoca

Abstract

INTRODUCTION: Leptospirosis is an infectious disease, a zoonosis, of bacterial origin and global spread, caused by *Leptospira* spp, which may have acute or chronic manifestation.

OBJECTIVES: The present study checks the evolution of a few cases of leptospirosis in students from the Faculty of Veterinary Medicine.

MATERIAL AND METHOD: For the current study we have used the data recorded in the medical files of students after anamnesis, the objective clinical exam, the epidemiological investigation, establishing the diagnosis of leptospirosis, treatment and monitoring of the case until recovery.

Establishing the diagnosis of leptospirosis, analysing the initial symptoms, showcasing the complications, studying the epidemiological enquiry, showcasing the role of primary prevention and of keeping with the hygienic norms labour safety.

RESULTS: The first case of leptospirosis first appeared with general symptomatology three days after coming into contact with the infected animal.

The epidemiological enquiry after diagnosing the first case of human leptospirosis led to the identification of 80 cases of direct contacts. They were monitored for 21 days at the students' medical office of the Faculty of Veterinary Medicine.

The first four cases appeared three days after contact with the infected animal and had general symptomatology (fever, acute asthenia, cephalalgia, myalgia, abdominal discomfort).

Of the 12 cases confirmed through specific serology testing (IgM specific), one was infected indirectly from another confirmed human case.

The first diagnosed case presented renal and haematological complications 5 days after infection and 2 days after the beginning of the specific treatment; it needed hospitalisation and the evolution under treatment was favourable.

All confirmed, probable and possible cases received treatment with antibiotics including 200 mg doxycycline per day for at least 10 days. The evolution under treatment was favourable.

There were no violent cases or fatalities. The confirmed cases did not wear the appropriate safety equipment upon contact with the infected animal.

CONCLUSIONS: Upon students' and vets' contact with a dog earlier diagnosed with leptospirosis, 12 cases of human leptospirosis were confirmed.

After the epidemiological enquiry, 80 direct contacts were identified. All suspect cases were monitored and handled by the medical staff of the students' medical office; the cases with specific symptomatology confirmed through IgM specific testing were advised to go to the Clinic of Infectious Diseases in time.

One diagnosed patient presented haematuria, anuria, renal and haematological complications, but under proper treatment the evolution was favourable.

There were no violent cases of fatalities.

Abiding by the labour safety regulations, cleaning and disinfecting measures, as well as interdisciplinary collaboration are essential in preventing and solving cases.

KEYWORDS: leptospirosis, students, symptoms of leptospirosis

* **Corresponding Author:** Nicoleta Ancuța Pinteală, university medical office Cluj-Napoca, e-mail: ancutapinteala@yahoo.com

Article received: 21.12.2022, accepted: 13.01.2023, published: 13.01.2023

Cite: Pinteală NA, Baciu S, Marc G. Monitoring the outbreak of leptospirosis at the academic medical office of the University of Agricultural Sciences and Veterinary Medicine (USAMV) in Cluj-Napoca. The Journal of School and University Medicine 2023;9(4): 25-28

INTRODUCTION

Leptospirosis is an infectious disease, an important zoonosis, of bacterial origin, caused by *Leptospira* spp, a thin gram-negative spirochaete with an increased mobility [1, 2].

The reservoir are wild and domestic animals, which may be infected without presenting clinical manifestations; rats are the most frequent source.

Leptospire are evacuated by animals through urine and they survive in water, moist soil, vegetation.

Transmission

Man can get infected through contact with the infected animal's urine and other biological fluids, or by entering into contact with the water, the soil or the food contaminated with the urine of infected animals. The leptospire enters the human body through teguments or mucosae, especially if having lesions, or through intake of contaminated water. The leptospire may also be transmitted to the foetus during pregnancy from the infected mother.

Clinical manifestations

Leptospirosis can manifest through a large spectrum of clinical signs, mainly depending on the serovariants and the host's immune state, beginning from asymptomatic to severe clinical manifestations, even violent ones [1].

After the haematogenous spread, there are manifestations of dysfunction, mainly hepatic and renal, but there can also be pulmonary, splenic, retinal, cardiac, central nervous or pancreatic manifestations etc.

There are several clinical forms from the mild one (similar to the flu) and up to the Weil syndrome (icterus, renal insufficiency, meningitis, myocarditis, pulmonary haemorrhage, respiratory failure).

The majority of patients have a mild form, but 5-10% present the serious form.

The period of incubation is between 2-10 days.

The infection evolves in two stages: the acute (septicemic) phase, lasting between 5-7 days; and the second, immune stage characterised by the induction of antibodies and elimination of leptospire through urine (4-30 days).

On the long term, the disease is self-limited and often without clinical manifestations, but there are also violent forms (5-15%) which have a reserved

prognosis. Other unfavourable factors for the evolution of the disease are: age (over 40), oliguria, respiratory failure, cardiac arrhythmias.

The debut can be sudden with fever, chills, arthralgia, myalgia, asthenia. There may be disturbances in the coagulation: nasal, gastro-intestinal haemorrhage, petechiae etc.

The renal form manifests itself through anuria. The symptoms may be mild or serious, and they can manifest for 3-4 weeks [1].

Paraclinic examinations

The haematological and biochemical results show a significant leucocytosis ($40 \times 10^9/l$), a subsequent leukemoid reaction, with a titre of white cells of over $80 \times 10^9/l$ [3] and haemolytic anaemia generated by the released toxins, the thrombocytopenia [4].

Biochemically, there is a significant increase in the urea and the serum creatinine, as well as an increase of alanine aminotransferase (ALT), aspartate aminotransferase (AST) and of alkaline phosphatase (ALP) [2,5].

Hyperbilirubinemia appears constantly increased together with the increase of azotemia [1].

Upon a biochemical urinary exam, depending on the degree of renal damage, there can be isosthenuria (more seldom hyposthenuria), together with proteinuria of various degrees [2]. The paraclinic modifications support the primary damage of hepatic-renal functions, as well as generalised vasculitis.

The ultrasonographic exam: the most important and obvious alterations are found at the renal level and they include cortical hyperechogenicity, renal enlargement, usually moderate pyelectasis, vascular dilatation and very important – the existence of a hyperechogenic bandelet at the level of the renal medulla [5].

At the level of the liver, there is a hepatic enlargement of different degrees (usually mild or moderate), splenic enlargement (similar to hepatic enlargement in amplitude), the morphometric increase of the pancreas as well as hypoechogenicity.

Confirmation tests

The certain diagnosis includes the use of specific tests to detect the pathogen as well as serologic testing to identify the host's immune response.

The golden standard is represented by the *in vitro* isolation of the pathogen; however, the real diagnosis value of such an approach is extremely low, mainly because of difficulties in isolation and the necessary time of up to 6 months [1,2,5].

qPCR test

The most important advantages in using this test are: the remarkable sensibility and the consecutive possibility to detect an infection beginning on day 2 of its debut, the possibility to quantify (identification of bacterial load), so that the curating doctor may benefit from an adequate level of information (the high bacterial load reflects certainly an active infection).

OBJECTIVES: The present study checks the evolution of a few cases of leptospirosis in students from the Faculty of Veterinary Medicine.

MATERIAL AND METHODS

Monitoring the suspect cases after contact with a dog diagnosed with leptospirosis at the students' medical office of the Faculty of Veterinary Medicine in Cluj-Napoca

As presented in other articles, the students' medical office of the University of Medicine and Pharmacy in Cluj-Napoca monitored and triaged in special epidemiological conditions during other existing breeding grounds of infectious-contagious diseases [6].

The medical staff proved professionalism in managing the suspect cases and the measures needed in this case.

On 28th March 2022, a female patient with fever, myalgia, arthralgia, cephalalgia, and an altered general state entered the students' medical office. The staff performed a rapid SARS-CoV2 antigenic test, which had a negative result, and the patient was sent to the Clinic of Infectious Diseases for further medical investigations and treatment, where, the following day, it was confirmed that she had a reactive IgM titre to leptospirosis and significant clinical and paraclinic alterations.

Treatment with 100mg doxycycline every 12 hours for ten days was prescribed.

Two days into the treatment, the patient presented macroscopic haematuria and was hospitalised at the Clinic for Infectious Diseases for further investigations.

After the diagnosis of the first case, the epidemiologic enquiry identified the epidemiologic link, which

was a dog confirmed to have been infected, investigated, hospitalised and diagnosed at the Veterinary Clinic of the Faculty of Veterinary Medicine, at USAMV in Cluj-Napoca, during 25th-28th March 2022.

The second patient showing symptoms and having had direct contact with the infected animal showed up at the medical office on 29th March, with myalgia, cephalalgia, asthenia and fever. They were sent to the Clinic for Infectious Diseases, where the result was uncertain, but treatment with doxycycline 2x200 mg for 10 days was prescribed.

On 31st March, the third patient arrived at the medical office, presenting two-day cephalalgia. She was sent to the Clinic for Infectious Diseases, where the diagnosis was confirmed (reactive IgM). This patient had not been in direct contact with the infected animal, but rather she had used the same water mug as the first confirmed patient (indirect transmission by switching: from one object to another).

During 1st April, the fourth patient visited the medical office showing symptoms of abdominal discomfort; the student had been in direct contact with the animal's fur, without wearing safety equipment and gloves.

After the confirmed test, the diagnosis for this case was also leptospirosis.

In the 21 days of monitoring suspect cases, 12 patients showing symptoms had been referred to the Clinic for Infectious Diseases for diagnosis confirmation. All patients presenting leptospirosis-specific symptoms were tested at the university medical office with quick SARS-CoV2 antigenic tests, for differential diagnosis.

Measures to fight and prevent the spread of leptospirosis spp. infection

Together with representatives from the Public Health Directorate of Cluj county, the infection prevention and limitation measures were applied: students were re-educated on the safety measures, focusing on wearing the safety equipment, following the rules of hands hygiene and wearing gloves, and each group had a responsible in charge of checking such rules were abided by; all common spaces where the sick animal entered were cleaned and disinfected; the 4th-6th-year students-patients and the doctors from the Emergency Clinic of the Faculty of Veterinary Medicine in Cluj-Napoca – all who had come in contact

or had cared for the confirmed animal during 25th-28th March (80 people) were kept under medical surveillance for 21 days from the date of the last contact.

RESULTS AND DISCUSSIONS

The first leptospirosis diagnosed case began with a general symptomatology three days after the contact with the infected animal.

The patient presented themselves at the students' medical office where, after an objective clinical examination, given the altered general state, a Covid infection, in the context of the current pandemic, was excluded, and the patient was sent to the Clinic for Infectious Diseases for diagnosis and expert treatment to be established. There, the diagnosis was infection with leptospira spp. An epidemiological investigation was started.

As a results of the epidemiological investigation carried through after diagnosing the first case of human leptospirosis, 80 cases were identified as direct contacts of the dog hospitalised at the Veterinary Clinic.

They were monitored for 21 days, after confirmation of 12 symptomatic cases through IgM specific identification test.

The first four cases appeared three days after contact with the infected animal. Of the confirmed cases, one was infected through indirect contact, by relay from another confirmed human case.

The first diagnosed case presented renal and haematological complications; it required hospitalisation, but the evolution under treatment was favourable.

All confirmed, probable and possible cases received treatment based on 200 mg/day doxycycline antibiotic for a minimum period of 10 days. The evolution under treatment was favourable. No violent cases or demises were registered.

The confirmed cases hadn't worn appropriate safety equipment upon coming into contact with the infected animal.

CONCLUSIONS

These cases show the importance and the role of watchpeople at the school and university medical offices [7] in early diagnosis, limiting and preventing the spread of an infectious-contagious disease, such as leptospirosis.

Also, we'd like to mention the prompt response of the medical staff.

We would furthermore mention the specific control of following the hygienic-sanitary norms in education areas, a control that must be performed by the medical staff of the university medical office according to the OHM 438/2020 [8].

It is highly important that safety equipment be worn, equipment procedures and appropriate wear be followed by students, doctors and academic staff at the Faculty of Veterinary Medicine in Cluj-Napoca.

We'd like to also comment on the importance of interdisciplinary collaboration (the Faculty of Veterinary Medicine – the academic medical office – the Clinic for Infectious Diseases – the Public Health Directorate) for the early diagnosis, limitation and surveillance of the spread of an infectious-contagious disease, as well as applying the current norms and methodologies when reporting and monitoring leptospirosis [9].

A challenge for school and academic medicine is the diversity of the pathology encountered in this medical office, where novel situations were met, such as: dog bites, cat bites, snake bites, tick bites, Q fever outbreaks, other outbreaks for leptospirosis etc.

REFERENCES:

1. CDC. Leptospirosis. 2019. Source: <https://www.cdc.gov/leptospirosis/index.html>
2. Gompf S.G. Leptospirosis: Practice essentials, Background. Pathophysiology 2018. Source: <http://emedicine.medscape.com/lookup/compendium/leptospirosis>
3. Haake DA, Levett PN. Leptospirosis in Humans. *Curr top Microbiol Immunol* 2015;387:65-97.
4. Deepa SA, Salony M, Harini V, Sowmya M. Serial Changes in Complete Blood in Patients with Leptospirosis, *Journal of clinical and diagnostic research* 2017;11(5):EC21-EC24.
5. Davenport A, Rugman FP, Desmond MJ. Is thrombocytopenia seen in patients with leptospirosis immunologically mediated? *Journal of clinical pathology* 1989;42(4): 439-40.
6. Pintea N, Baciuc S, Varodi C. Studiul unui focar de febră Q în cadrul unui dispensar studentesc. *The journal of School and University Medicine* 2019;6(4):5-10.
7. Rajka D. The role of school medical office. *The journal of School and University Medicine* 2019;6(3):27-34.
8. Order of the Health Minister, No. 438/ 2022 regarding insuring medical assistance to pre-schoolers, pupils in pre-university education units and to students in higher education institutions for maintaining health within communities and promoting a healthy lifestyle.
9. Resolution No. 589 of 13th June 2007, addendum 1 on establishing the methodology for reporting and collecting data for the surveillance of transmissible diseases, issued by the Romanian Government.