

HUMAN BRUCELLOSIS, A CASE REPORT IN THE MUNICIPALITY OF VALENÇA - RJ

BRUCELOSE HUMANA, UM RELATO DE CASO NO MUNICÍPIO DE VALENÇA - RJ

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ABSTRACT

Brucellosis is a neglected disease, its epidemiological rate in humans is not known for certain, as it is often underdiagnosed and underreported. This report aims to clarify, based on the case studied and other studies in the literature, about the clinical and dissemination/contagion form, so that there is greater care with the food consumed. In addition, showing diagnostic and treatment methods and highlighting the importance of multidisciplinary actions such as: more rigorous veterinary surveillance, population awareness. This shows that these actions would have a major economic impact on the public health system and would also reduce demand.

KEYWORDS: Human brucellosis; zoonosis; control; dairy; pasteurization.

RESUMO

Brucelose é uma doença negligenciada, não se sabe ao certo sua taxa epidemiológica em humanos, pois, muitas vezes, é subdiagnosticada e subnotificada. Esse relato tem por objetivo esclarecer, com base no caso estudado e outros estudos da literatura, sobre forma clínica e de disseminação/contágio, para que haja maiores cuidados com alimentos consumidos. Além de, mostrar métodos de diagnóstico e tratamento e evidenciar a importância de ações multidisciplinares como: vigilância veterinária mais rigorosa, conscientização populacional. Evidenciando assim que estas ações trariam grande impacto econômico no sistema público de saúde, e também reduziriam a demanda.

PALAVRAS-CHAVE: Brucelose humana; zoonose; controle; laticínio; pasteurização.

1. INTRODUCTION

Brucellosis is a zoonosis, that is, it is a disease originating from contaminated animals, transmitted to humans, either through food, raw or undercooked meat, unpasteurized milk, contaminated water, or direct contact with an animal, being considered an

occupational disease in the latter case. This disease is the most common zoonosis worldwide and is a public health problem¹. *Brucella* spp. It is quickly exterminated when exposed to elevated temperatures, such as milk pasteurization. In countries that adopt this regular practice, brucellosis is found in the occupational form, with workers who deal directly with the contaminated animal or meat. This pathology is considered underreported due to the non-specific symptoms presented².

It is a neglected disease in the world, especially in developing countries. The animals present the following symptoms: reduced fertility, abortion, decline in milk production, causing an important economic impact, especially for small producers. In humans, the symptoms are nonspecific, such as: fever, arthritis, malaise, fatigue. It may present sequelae, such as fever and joint pain. This affects the country economically, as the patient needs to be away from work for days, affecting the entire family. There may be cases of transmission from person to person, through contact with the placenta, breastfeeding and rarely through sexual contact. Transmission occurs with exposure to tissues that contain considerable amounts of bacteria (placenta, aborted fetus, or their products – dairy products)³.

The disease can cause a lot of suffering and anguish in humans, as it directly results in loss of quality of life. She has an acute fever, may have joint involvement, loss of appetite, back pain, fatigue, headache. This infection can lead to complications in any organ of the system and can become chronic, which is common. In general, these affected patients are low-income and therefore suffer from a lack of access to the necessary support. In general, farmers with small livestock properties, generally with low income, are affected by brucellosis, having negative implications on livestock productivity and as a result they can suffer from depression, hopelessness and suicide in this area becomes common, often without access to mental health³. The health costs of the disease include laboratory diagnosis, medical service, hospitalization, medications, and treatments. In many places, this cost

falls on the patient and family. One study revealed that the cost was \$57 before diagnosis and \$947 one year after diagnosis. This higher cost after diagnosis is due to medications, necessary procedures, visits to emergency care and necessary laboratory tests. In addition, there are transport costs and lost working days, which the patient and family must cover. However, there is also an increased prevalence of individuals without access to health services, which contributes to complications and reduced life expectancy³.

There is greater evidence of *Brucella melitensis* in humans, when compared to *Brucella abortus*. The first is the one that causes more intense symptoms, greater involvement of tissues and systems in the body. *B. abortus* has cattle as its natural host and reservoir. *B. melitensis* is found in small ruminants².

According to Franc *et al.* As of 2018, the prevalence of brucellosis in cattle in Latin America is 0.5 – 10% and the prevalence of the disease in humans is unknown.

This disease is observed in young males. According to a study, there is no relationship with work risk but with the fact that men are less attentive and careful with their diet, eating more raw foods and unpasteurized milk/cheese².

The laboratory criteria for diagnosing brucellosis are: Isolation of *Brucella* spp. of clinical samples; *Brucella* agglutination titer; Elisa (IgA, IgG, IgM), 2-mercaptoethanol test, complement fixation test, combs, fluorescence antibody test. A screening test with Rose Bengal can still be used; positive results must be confirmed by the previously mentioned tests⁴.

The isolation and identification of *Brucella* can be done in blood culture, but it can also be done in bone marrow, cerebrospinal fluid, wounds, purulent discharge and joint fluid⁵.

A case is considered suspicious when it has a compatible clinical and epidemiological history linked to a suspected or confirmed case of contaminated animals or food. It is said to be probable when there is a compatible symptom and a positive rose bengal test, but a negative blood culture test and low titers in confirmatory tests. It is confirmed when it is positive in the laboratory test⁴. Brucellosis has an important impact on the economy, with direct and indirect effects on them. The direct effects, that is, those that are visible, are: cattle abortion, reduced milk production, chronic weight loss, infections, premature death or slaughter of cattle, veterinary costs. This can cause a scale-down in herd productivity and the livelihoods of farmers who depend on the meat and dairy trade. Invisible direct losses are reduced fertility, change in herd structure, transmission to nearby herds. The indirect effects are, in turn, social expenses for managing the disease, costs for the veterinary service, vaccination, diagnosis, farmer with compensation³.

For prevention, a stable veterinary infrastructure and an animal identification system must be sought for subsequent implementation of an effective control plan.

This will reduce all types of zoonosis³.

Veterinary surveillance has significantly reduced the incidence of this pathology in both animals and humans, meaning official control would be capable of eliminating the disease. The biggest obstacle to this is small producers, home producers, who tend to add a little unpasteurized milk cheese to give the product a little more flavor².

In several parts of the world, this disease was eradicated with multidisciplinary strategies, with vaccination, testing and slaughter of sick animals. This is an arduous task and requires a lot of expense for adequate control. Prevention of this disease must include strict surveillance, combating underreporting, greater control of animals, their vaccination and population awareness regarding the habit of eating unpasteurized, raw, or undercooked food².

The eradication or reduction of brucellosis is a multidisciplinary action, with a doctor, veterinarian, public health, cultural, economic, and social specialists, for a vaccination campaign, community outreach, education, and rigorous surveillance. Environmental and animal health are interconnected. A study showed that spending US\$8.3 million on mass vaccination of cattle and small ruminants would result in a financial return of US\$26.6 million. This demonstrates the importance of multidisciplinary action to combat this disease, implementing strategies that prevent its spread³.

The treatment of brucellosis consists of the use of antibiotics, which alleviate symptoms, reduce illness time, and reduce complications. These medications require adequate penetration, as *Brucella* is intracellular. Most of the time, treatment lasts around 6 weeks and uses combined antibiotics, as monotherapy has a lower rate of effectiveness. The following are used: tetracyclines, aminoglycosides, rifampin, Cotrimoxazole, quinolones and 3rd generation cephalosporins. These polymicon agents are chosen according to age, pregnancy or not, toxicity and risk of worsening the condition. The regimen that demonstrated the best efficacy was doxycycline 100mg, orally every 12-12 hours for 6 weeks, with streptomycin 1g/day intramuscularly for the first 3 weeks. The latter, as it is an ototoxic drug, is avoided in people over 55 years of age and is changed. Another regimen is doxycycline with rifampicin 600 – 900 mg/day, orally, for 6 weeks. However, according to some studies, the use of tuberculostatic drugs associated with doxycycline is not possible to assess the serum level of the drugs. It is noted that symptoms improve after 14 days, after starting pharmacological treatment there may be acute symptomatological worsening, but it is not necessary to suspend the medication. In the localized or chronic form, antimicrobial use lasts for 3 to six months, depending on the clinical, laboratory and imaging findings. It may be necessary to associate it with surgical treatment, especially in severe localized osteo-articular cases and endocarditis¹.

After treatment, the patient is monitored every three or six months with serology and clinical monitoring, for at least 2 years. It is said to be a good response when there is a reduction in IgM1 titers.

2. MATERIAL AND METHODS

This is an observational and qualitative study, reporting a case that occurred at Hospital Escola Luiz Gioseffi Jannuzzi – HELGJ, Valença-RJ, Brazil based on a bibliographical review for the theoretical foundation of the article, carried out in scientific journals published in the timeline from 2000 to 2020 on the topic, in electronic bibliographic record bases, such as Latin American and Caribbean Literature in Health Sciences (LILACS), Medical Literature Analysis and Retrieval System Online (MEDLINE), and Scientific Electronic Library Online (SciELO), in addition to collections of regularized medical publications, which are the main sources of referenced information.

Data collection was carried out by observing a patient with the disease during his hospitalization at the Hospital Escola de Valença/RJ, in 2020. The instrument used for this collection were the medical records and evolutions during the patient's hospitalization. The discussion is based on the patient's step-by-step workup based on the author's view of the etiology, diagnosis, and treatment of Brucellosis. The descriptors used for the bibliographic basis of the article were the following: Brucellosis; Human Brucellosis; *Brucella* spp; Mediterranean fever; Maltese fever; Zoonoses.

After obtaining data collection, they were analyzed according to their thematic content and organized into systematic material (Scheme below), being classified, according to the information by categories, in the registration unit. The analysis was processed in three phases: in the first phase, the material was organized, and the ideas were systematized; in the second phase, a classification of information into categories, in a records unit and the third phase refers to the treatment and interpretation of data based on literature.

The present study was submitted and approved by the Ethics and Research Committee of the Faculty of Medicine of Valença/RJ, in accordance with Resolution 466/2012.

3. CLINICAL CASE

Patient, 54 years old, white, retired as a police officer, resident of the countryside, reported that he began experiencing adynamic, prostration, fatigue, weight loss of 8kg in 3 months and night sweats 3 months ago, requiring a change of clothes for 3 times during the night. Associated, he described an afternoon fever (37.5°) and peripheral tremors. According to him, this clinical condition was disabling, preventing him from conducting his daily activities.

Not without previous comorbidities. He denied continuous medication use, as well as allergies and previous blood transfusion. She reported a previous upper digestive endoscopy that demonstrated gastritis.

He denied smoking, reported social alcoholism, and denied using illicit drugs. Resident of a rural area for 2 years, with basic sanitation, raising livestock, but without producing dairy products. He ate cheese and its products from the neighboring owner who produces and sells it.

Due to this condition, he went to the emergency room several times, sought out a gastroenterologist, a cardiologist, and no changes were identified other than the gastritis found. The laboratory tests were unchanged. Until he was advised to see an infectious disease specialist, who requested more specific tests. These demonstrated the results described below: Total abdominal ultrasound: Liver with normal volume, regular contour and parenchyma with homogeneous ultrasound texture, normal bile ducts, normal gallbladder, normal pancreas, kidneys with normal shape, topography and dimensions, normal spleen. Normal abdominal aorta, regular bladder, absence of free fluid.

- Upper gastrointestinal endoscopy: positive urease test, moderately elevated endoscopic erosive gastritis of the antrum.

- Doppler echocardiogram: EF: 72%, normal global and segmental systolic function, grade I diastolic dysfunction, normal wall thickness, small LV cavity enlargement, valves with normal morphologies, mild mitral regurgitation.

- HB: 14, HT: 43%, LEUCO:3900 (0-0-0-0-60-33-6), PLQ: 190000, RH: 32, CR: 1.01, NA: 141, K: 4.2, FA: 67, GGT:35, TGO:49, TGP: 125, BT: 0.58, BD: 0.16, BI: 0.42, LDH: 407, VDRL negative, HIV 1 AND 2 non-reactive, ANTI HCV non-reactive, Blood culture without growth in both samples, HBC IGM non-reactive, HBC TOTAL non-reactive, anti-HBC IgG non-reactive, Test for treponema pallidum IGG non-reactive, protein electrophoresis within normal limits, cytomegalovirus IgG 376, cytomegalovirus IgM 0.3 toxoplasmosis IgG 280.10, toxoplasmosis IgM 0.24, serum agglutination for brucellosis reactive, serology for brucellosis IgM: 55 and IgG: 216.

Given the diagnosis, treatment was started with doxycycline 100mg orally 12/12h and rifampin 600mg orally, both for 6 weeks. During this period, the patient was monitored with a hepatogram every week.

The case was notified, and health surveillance carried out inspections of the patient's cattle and those of the neighboring owner, who produced milk and dairy products. Both cattle were evaluated, and 3 neighboring cattle were identified as positive for brucellosis and sent for slaughter.

After the end of treatment, the patient was in better general condition, recovering his initial weight and improving all clinical symptoms.

4. DISCUSSION

With this case report, it was possible to confirm the symptoms expected to be found in the patient affected by brucellosis⁶. This was a male patient, 54 years old and living in a rural area who consumed products from

neighboring producers, which shows a high epidemiological factor in accordance with what was found in the literature⁷, which did not seek the origin of the food consumed, which would be avoided if the origin was ascertained before food intake³. In addition to observing the neglect of this zoonosis, the patient took 3 months to get the correct diagnosis, seeing several doctors during this period, and the disease was not raised as a hypothesis in all previous consultations with the infectious disease specialist, showing a lack of knowledge of the disease. It is evident that both parties (doctor and patient) are unaware of the disease⁸. It generated public health expenses, as the patient required several tests to finalize the diagnosis, and to undergo several specialists^{2,3}. With greater dissemination of information about the disease, these costs and exams would be unnecessary and thus the diagnosis would have been made more quickly, as would the treatment, avoiding a possible chronicity of the disease³, which did not happen in the case mentioned, but could have happened^{1,3}. The patient in the clinical case did not require leave because he was a retired patient, however, otherwise, the patient would have needed leave, as it was a disease that caused intense adynamia and prostration, not allowing him to carry out daily tasks^{2,3}. This is in agreement and evident in the article ANDREOLI, Thomas E. et al.

It is possible to verify the lack of rigorous surveillance, especially with small producers, who were responsible for the spread of the bacteria through products such as milk, cheese and derivatives in the case described, in agreement with FACCIOŁÀ, Alessio et al. If there had been greater control, greater supervision, this could have been avoided, as the cattle would have been vaccinated and production would have been pasteurized^{7,9}.

It generated economic changes for the small producer in question, as he lost 3 of his cattle, which required slaughter⁹. It generated economic expenses for the brucella victim, as it took time to go to the health professional, spent on exams, transportation to the necessary health homes and medication^{5,6}, as made clear in the study by FRANC, K. A. et al and ANDREOLI, Thomas E. et al. The treatment was carried out with 2 antimicrobials, due to the possibility of resistance, it was carried out for a prolonged period (6 weeks), like the study ANDREOLI, Thomas E. et al., shortly afterwards the patient showed clinical improvement, however in disagreement with the study, the patient did not undergo serology follow-up after treatment. The patient in question did not present sequelae, did not cornify, as can be observed in some cases according to the study SANTANA, Luiz Alberto et al.

5. CONCLUSION

It is possible to conclude that there is a need for greater dissemination of the disease and specific and sensitive diagnostic laboratory methods so that we can better understand human brucellosis in Brazil and its

real incidence.

Multidisciplinary action is needed, with awareness not to eat food without knowing its origin, not to eat food derived from unpasteurized milk or raw/undercooked meat. Vigorous surveillance is needed for rural producers. Vigilance regarding adequate vaccination of livestock is essential. If this were done properly, it would avoid unnecessary expenses with exams, unnecessary health professionals, transportation, and medication.

6. REFERENCES

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