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Fasciitis by *Lactococcus garvieae* on an immunosuppressed patient by Diabetes Mellitus

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Abstract

Lactococcus garvieae, a gram-positive anaerobe facultative coccus, is a well-known pathogen in the aquaculture and cattle sector, being extremely rare for human beings. There are some case reports of infections caused by this microorganism, however, there are no fasciitis cases up to date. This is a case of a 24-year-old patient with uncontrolled diabetes mellitus and previous COVID-19 pneumonia without sequelae, admitted to the emergency room for a case compatible with fasciitis. Three cultures for *L. garvieae* were obtained from surgical debridement and microbiological studies were performed using automated VITEK-2 equipment. No posterior complications were documented. The patient went through a skin graft with a favorable response without evidence of clinical relapse.

Key word: fasciitis, lactococcus garvieae, Covid-19.

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Introduction

Lactococcus garvieae is a gram-positive coccus, facultative anaerobic and catalase-negative, that is rarely isolated from human samples, considering the relation with previous animal exposure. It is responsible for certain infectious processes like bovine mastitis or fish infections, but it's extremely rare in human beings (1). Initially, it was found on septic processes in 1950 in Japan, related to the breeding of the rainbow trout (*Oncorhynchus mykiss*), as well as in consumption of unpasteurized dairy products. However, over the past years, there have been new unconventional case reports appearing in literature (2). Between those new cases, endocarditis, osteomyelitis, meningitis, hepatic abscess, and peritonitis has been described (3).

In the present article, we are reporting the case of fasciitis by *L. garvieae* infection of an immunosuppressed patient (because of diabetes mellitus), with a successful response to antibiotics and surgical cleanings.

No previous report cases were documented in Peru related to infections caused by *L. garvieae* on humans, being this the first reported case in our country, as well as the first fasciitis case in worldwide literature.

Considering this report to be the first case of fasciitis by this bacteria, the clinical course of illness could not be predicted; however, the actual clinical manifestations reflect the natural process of bacterial fasciitis similar to infections caused by common germs (4). All the case reports in literature determined that bacterial endocarditis (principally of the native valve) as the most frequent clinical presentation, followed by the sepsis cases and the joint prosthesis infections(3).

During inpatient care, no additional complications were reported, showing a successful response to the antibiotic coverage consisting of parenteral vancomycin and trimethoprim/sulfamethoxazole as well as daily cleansing and surgical cleanings.

Case report

A 24-year-old male patient, with a medical history of, one year of uncontrolled diabetes mellitus and a previous hospitalization of four months due to COVID-19 pneumonia (with no respiratory complications), was admitted to the

emergency room with 14 days of symptoms, characterized by progressive swelling and pain of right arm after welding activities.

The clinical case was initially characterized by an ampullary lesion on the right hand, after a regular job activity (probably a burn from the welder). On posterior days, the lesions exhibit hyaline drainage, and progressive pain associated with upward volume growth that limited his regular activities. As an important epidemiological factor, there was no additional previous trauma on this limb, nevertheless, he referred to using non-potable water for his regular hygiene.

During his hospitalization, the patient underwent surgical cleaning and fasciotomy due to suspicions of a compartmental syndrome, in which purulent content and devitalized tissue were removed. He also received empiric parenteral antibiotic treatment based on intravenous clindamycin and vancomycin, as well as daily cleansing by the plastic surgery department. In the following days, decrease in secretions was observed but granulation tissue was absent, yet there was persistence of necrosis on the limb.

Once the first culture result from the operating room arrived, and it was revealed the isolation of L. garvieae, the team made the medical interconsultation to the Infectology department for antimicrobial optimization (Table 1). Considering the antimicrobial susceptibility shown by automated VITEK-2 equipment and through medical literature review, an optimization strategy was performed consisting of parenteral vancomycin plus trimethoprim/sulfamethoxazole orally every 12 hours. Clindamycin treatment was suspended according to the medical review. Daily surgical cures were continued by the surgical department. In posterior secretion cultures, the same etiological agent is evident.

Table 1. Culture results and antimicrobial susceptibility

Sample	Abscess Secretion		
Date	C1(11/11/20)	C2(11/13/20)	C3(11/13/20)
Agent	*Lactococus Garvieae*		
Antibiotics	**Results**	**Results**	**Results**
Benzylpenicillin	S	R	S
Levofloxacin	R	S	R
Cefotaxime	R	R	-
Trimethopin/ Sulfamethoxazole	R	R	R
Erythromycin	S	S	S
Vancomycin	S	S	S
Clindamycin	S	S	S
Rifampicin	S	S	S
Linezolid	S	S	S

Abbreviations: C Cultive, S sensible, R resistant

In the following days, there is gradual clinical improvement with the decrease of necrotic tissue, making this limb viable for a skin graft (Figure 1).

Fig 1. Extensive necrotizing lesion on the right forearm with granulation tissue

Discussion

L. garvieae is a gram-positive coccus, previously included in the genus Streptococcus being differentiated in 1985 due to DNA hybridization studies, considering that now there are multiple genomic variants (1,2). This agent has been related to some activities such as fish breeding and found in unpasteurized dairy products as well as raw beef or pork, however certain reports establish a possible connection between this microorganism and contaminated water (6,7).

In recent years *L. garvieae* has been recognized as a potentially infectious agent of zoonotic origin. Previous medical reports described this agent as a cause of infection in immunocompetent patients, however immunocompromised patients seem to be the group at greater risk for infections due to this bacteria (6). Some theories for possible access for *L. Garvieae* consider physiological or anatomical defects from the digestive tract, raw fish consumption or unpasteurized dairy products, though the presence of skin wounds seems to be another way for developing this infection (8).

The actual case reflects an unusual clinical manifestation of infection by L. garvieae. The immunosuppressed state of the patient because of uncontrolled diabetes mellitus, must have been the conditioning factor for the infection to set forth (2).

The diagnosis of this entity is primordially based on the microbiological results, pointing out the importance of the cultures before the start of empirical antimicrobial therapy. It is worth noting, common agents for fasciitis are gram-positive bacteria such as Streptococcus pyogenes or Staphylococcus aureus. This is the first reported case of fasciitis caused by *L. garvieae*.

Empirical treatment was initiated with intravenous oxacillin and clindamycin and after 16 days of administration, poor response due to intermittent pain and persistence of pus discharge was observed. Intravenous vancomycin was employed, with maintenance of clindamycin and suspending oxacillin administration for 5 days with decreased secretions but intermittent pain persisted. Interconsultation to the Infectious diseases department was requested, and a revision of medical literature was necessary, finding that resistance to aminoglycosides and clindamycin was high in susceptibility studies. (9) Suspension of clindamycin and start of trimethoprim/sulfamethoxazole were indicated as recommendations after revision and clinical follow-up was continued by infectious diseases physicians. 10 days after antimicrobial modifications, swelling, pain and number of secretions were absent and successful clinical improvement was achieved.

For species identification cultures, Vitek 2 kit with GP identification card (Biomérieux) was performed in our medical institution, reporting isolation of *L. garvieae* in 3 samples from surgical interventions, with the same susceptibility records.

Due to all the endocarditis cases reported in the literature, the patient was submitted to an echocardiographic study where no abnormal growths or vegetations were found. Hemodynamic alterations were absent during medical hospitalization.

It is noted that the previous hospitalization of four months before the current was due to COVID-19 pneumonia, where the patient acquired basal consolidations and air bronchogram on the thoracic tomograph with positive serologic examination (IgM/IgG). The patient needed no internment to the critical unit, being discharged without important symptomatic sequels. Until now, it is unknown if the COVID-19 infection could condition secondary immunosuppression, in that case, that antecedent could be added as a risk factor for developing this kind of infections (10).

In summary, *L garvieae* is an important zoonotic infectious agent with different points of access that may cause life-threatening conditions such as infective endocarditis. Cultures, microbiological identification and antimicrobial susceptibility are important for deciding optimal antibiotic therapy.

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Conflicts of Interests

Gustavo Valencia, Iliana Cano and Ana Castillo-Soto do not have any conflicts of interests. They didn't receive any grant for the making of this paper.

Ethics

This article did not require the approval of any ethics committee, but followed the recommendations of the Declaration of Helsinki and informed consent was obtained from the patient.

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