journal homepage: https://jablm.acclmp.com/

Journal of Applied Biochemistry & Laboratory Medicine (2021) 02 (1):5-6

Case Report

# Title: Co-infection of Pasturella multocida and Salmonella sp. in a Cat Bite Wound: An Unusual Case Report

Sweta Shah[1]*, Tanu Singhal[2], Ahemad Quazi[3], Pooja Thakkar[1], Sushima Poojary[1]

1. Consultant, Microbiology, Kokilaben Dhirubhai Ambani Hospital and Research Institute, Mumbai
2. Consultant, Infectious Diseases, Kokilaben Dhirubhai Ambani Hospital and Research Institute, Mumbai
3. Consultant, Plastic Surgery, Kokilaben Dhirubhai Ambani Hospital and Research Institute, Mumbai

ARTICLEINFO

*Keywords:*

Pasteurella multocida, Cat Bite, Co-infection, Salmonella wound infection

ABSTRACT

This is a case report of polymicrobial wound infection followed by cat bite with a usual organism Pasteurella multocida and an unusual organism Salmonella sp. Patient had non healing wound for one month despite debridement and antibiotic treatment. Co-infection could not be identified in initial culture probably due to difference in bacterial load which resulted in delayed wound healing and long term antibiotics treatment. Repeated cultures from non-healing wound might be needed as in our case for complete treatment.

**Introduction:**

**Case Report**

This is a case report of polymicrobial wound infection followed by cat bite with a usual organism Pasteurella multocida and an unusual organism Salmonella sp.

A 57 years old lady was admitted to the hospital with cellulitis of dorsum of the left hand and index finger. She came with history of cat bite approximately five weeks back and had undergone debridement of the same site about four weeks back. She was non-diabetic and haemodynamically stable. Debridement was done on the next day of admission in our institute. Pus was sent for culture and the patient was given Amoxicillin-Clavulinic Acid combination (650 mg thrice a day) for 7 days. Mupirocin ointment was given for local wound dressing. Culture from pus and tissue both grew Pasteurella multocida which was sensitive to Ampicillin, other beta-lactam antibiotics, quinolones and aminoglycocides. The patient was referred to Infectious Disease specialist. After one week of debridement and antibiotic therapy, the patient returned with some degree of erythema and swelling. Amoxicillin-Clavulinic acid combination (650 mg thrice a day) was continued for another 7 days. After one more week of the antibiotic therapy (day 15 since debridement) the wound site showed hypertrophic granulation tissue with small pus discharge. It was considered as recalcitrant Pasteurella infection. Doxycyclin (100mg twice a day) was added for 7 days. On the next follow up after 3 days of Doxycyclin, the pus was sent for culture. It grew Salmonella sp. which was sensitive to both third generation cephalosporin and ciprofloxacin. The patient was started with ciprofloxacin (500 mg twice a day for 7 days). Doxycycline was continued. After one week of ciprofloxacin and two weeks of Doxycyclin (in total), there was no pus discharge and there was reduction in the swelling. X-ray was done to rule out osteomyelitis. Ciprofloxacin was continued for one more week with satisfactory outcome. Patient was asked to follow up in case of any redness, swelling, pain or fever. There were no complaints after 3 months.

Pus and tissue specimen obtained intra-operatively were cultured directly on 5% Columbia sheep blood agar, 5% Columbia sheep chocolate agar, Mac Conkey's agar and both the specimens were also inoculated in the liquid broth medium for automated culture on all the occasions. The identification and sensitivity of gram negative bacteria was done by Vitek 2 Compact (Biomerieux, France) as Pasteurella multocida. It's noteworthy that these bacteria grew only on Blood and chocolate agar and there was no growth on Mac Conkey's agar.

*Correspondence:

Dr. Sweta Shah, Consultant,

Microbiology Department, Kokilaben Dhirubhai Ambani Hospital and Research Institute, Mumbai

Email Address: Sweta.shah@kokilabenhospitals.com

Article received on 9th February 2021, Revised on 13th March 2021, Accepted on 22nd March 2021

However, in second culture, Salmonella grew on all the three media used for culture. Antisera was used to confirm identification as Salmonella group. Further speciation of Salmonella using antisera could not be done. Anaerobic culture would have been useful as anaerobes are commonly present in polymicrobial infection caused by animal bite. However, since the wound was superficial, not foul smelling and was treated with debridement and broad spectrum antibiotics one month back at another centre, clinically only multi-drug resistant aerobe was suspected and thus only aerobic culture was performed in the laboratory. Pasteurella multocida is Gram negative coccobacilli usually responsible for zoonotic infections. This pathogen is known to colonize the oropharynx of several healthy animals. In particular, cats and dogs have the highest carrier rates with 70%–90% of cats and 20%–50% of dogs being colonized.1 Most of the human infections with P.multocida are secondary to animal bites causing soft tissue and skin infections.2 A study done by Westling et al3 demonstrates that among seventy-nine episode of cat bite, Pasteurella multocida was isolated in 70% of the patients; in addition anaerobic pathogens were isolated in 16% concurrently with P.multocida, while Staphylococcus aureus was isolated in only two patients. Thus isolating Pasteurella multocida from our patient was expected and the patient was treated as per standard treatment protocol. However, it was not expected to have another gram negative bacteria causing the infection which we could not grow from both tissue pus even after augmented culture of the specimens. It is well known that Salmonella sp. can be found in animals as well as in environment causing various types of infections. Bone, joint, soft tissue infections with non-typhoidal salmonella have been reported in various studies. 5,6 However, literature also suggests that it is possible to contract Salmonella from infected cats, who may had fed on raw meat or wild birds and animals which can carry Salmonella sp and cat pass them in their stool and thus in the wound caused by a bite7.

In our case, the patient came to us for second debridement due to non-healing infected wound. Salmonella sp. did not grow in the first two specimens could be probably due to high load of Pasteurella multocida in the wound caused by cat-bite. However, the wound did not heal even after appropriate treatment given to the patient for the same. Salmonella grew only in the follow up culture. Since Amoxicillin-Clavulinic Acid and Doxycyclin both do not work against Salmonella which were used to treat P.multocida; it persisted in the non-healing wound causing swelling and erythema. Polymicrobial infections in wound caused by animal bite are common, however, co-infection of Pasteurella multocida with Salmonella sp. makes the case unusual. Both bacteria P.multocida and Salmonella can lead to chronic infection, osteomyelitis, and myositis and in rare cases septicaemia. Thus accurate identification and susceptibility are crucial for appropriate treatment. To summarise, multiple bacteria can be causative agents of skin and soft tissue infections due to animal bite. Both aerobic and anaerobic culture of tissue or pus are needed to identify them. Automated system allows identification of organisms which could be misidentified by manual system sometimes. Repeated cultures from non-healing wound might be needed as in our case for complete treatment.

**References:**

1. Giordano A, Dincman T, Clyburn BE, Steed LL, Rockey DC. Clinical features and outcomes of Pasteurella multocida infection. Medicine (Baltimore) 2015;94:e1285.
2. Wilkie IW, Harper M, Boyce JD, Adler B. Pasteurella multocida: Diseases and pathogenesis. Curr Top Microbiol Immunol 2012;361:1- 22.
3. Westling K, Farra A, Cars B, Ekblom AG, Sandstedt K, Settergren B, Wretlind B, Jorup C. Cat bite wound infections: a prospective clinical and microbiological study at three emergency wards in Stockholm, Sweden. J Infect. 2006 Dec;53(6):403-7. Epub 2006 Feb 14.
4. Pak S, Valencia D, Decker J, Valencia V, Askaroglu Y. Pasteurella multocida pneumonia in an immunocompetent patient: Case report and systematic review of literature. Lung India 2018;35:237-40.
5. Sankarankutty Jaya, Vipparti Harita Non-Typhoidal Salmonella Isolated From Extraintestinal Specimens: Case Report Arch Clin Infect Dis. 2013 April; 8(2): e14500.
6. Agnihotri N, Dhingra MS, Gautam V, Gupta V, Kaushal R, Mehta D. Salmonella typhi septic arthritis of hip--a case report. Jpn J Infect Dis. 2005 Feb;58(1):29-30.
7. https://www.cdc.gov/healthypets/pets/cats.html as accessed on 27.05.2019

How to cite this article.
Shah S, Singhal T , Quazi A , Thakkar P , Poojary S. Co-infection of Pasturella multocida and Salmonella sp. in a Cat Bite Wound: An Unusual Case Report. Journal of Applied Biochemistry & Laboratory Medicine 2021; 02 (1):5-6.
Access link for this article
https://jablm.acclmp.com/2021/02/01_5-6.pdf