

The Shell's Trouble: A Case of child bloodstream infection caused by *Aeromonas salmonicida* subsp. *salmonicida*

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Case report

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Abstract

Background

A. salmonicida (*Aeromonas salmonicida*) is a Gram-negative bacteria which frequently reported as fish pathogen. *A. salmonicida* is generally considered to be non-pathogenic to humans.

Case presentation

A 22-month-old boy was admitted to hospital with a one-day fever history, *A. salmonicida* subsp. *Salmonicida* was isolated from his blood. He had an epidemiological history of being scratched by a shell. After 6 days' antibacterial treatment, he recovered well and was discharged.

Conclusion

This case is the first report of *A. salmonicida* infection by shellfish and the patient is also the youngest patient among reported infected person. The empirical use of first-generation cephalosporin seems to be effective in the treatment.

Background

A. salmonicida is a non-motile aeromonad Gram-negative bacteria which belongs to the genus *Aeromonadaceae*. The optimum growth temperature for *A. salmonicida* is 22–25°C, and it rarely grows at 37°C [1]. *A. salmonicida* is widely known as a water resident bacteria which generally caused fish disease and affect the salmonid aquaculture industry [2–3]. As we know, *A. salmonicida* can be divided into five subspecies in more detail: *salmonicida*, *masoucida*, *smithia*, *pectinolytica* and *achromogenes* [1]. So far we have only a few articles that reported about *A. salmonicida* infected humans. In this paper, we present a case of *Aeromonas salmonicida* subsp. *salmonicida*. caused a 22 months old child's bloodstream infection.

Case Presentation

A 22-month-old boy was admitted to our hospital with one-day history fever and mid diarrhea. At admission, his armpit temperature was 39.7°C, respire was 30 times pear minute, pulse rate was 130 beats pear minute. Then, he took general laboratory tests, and blood culture was collected immediately. The test results showed as follow: white blood cell (hereafter referred to as WBC): 11.5×10^9 /L (reference range [hereafter referred to as RR]: $8.0 - 10.0 \times 10^9$ /L), neutrophils: 8.1×10^9 /L (RR: $3.0 - 8.0 \times 10^9$ /L), C-Reaction-Protein (hereafter referred to as CRP): 104.23 mg/L (RR: < 8.00 mg/L), procalcitonin (hereafter referred to as PCT): 1.77 ng/mL (RR: < 0.50 ng/mL), mycoplasma pneumoniae antibody (MP-IgM): negative, rotavirus antibody : negative, the remaining biochemical tests were basically normal. The child was initially diagnosed as an upper respiratory infection and treated with cefathiamidine and rehydration for empirical treatment.

After three days treatment, the child's condition improved and his body temperature returned to normal (36°C), a complete blood count and (CRP) test did again, and the result was follows: WBC: 7.4×10^9 /L, neutrophils: 2.8×10^9 /L, CRP: 23.18 mg/L.

The blood culture indicate positive after 11.6 hours of incubation in BD 9120 (Becton–Dickinson, New Jersey, United States) automated blood culture system, the positive bottle was transferred to blood agar plate and Macconkey agar plate for separation and culture, subsequently, identification and drug susceptibility tests were carried out for the isolated bacteria (VITEK 2 COMPACT). The culture results showed *Aeromonas salmonicida* subsp. *Salmonicida* growth, and the drug susceptibility test results were presented in table. 1.

Day 4, the treatment medication was adjusted from cefathiamidine to ceftriaxone according to the results of drug sensitivity. Day 6, the child had no more fever and his general condition was good. Here was the last laboratory tests result: WBC: 7.8×10^9 /L; neutrophils: 2.3×10^9 /L; CRP: 9.33 mg/L; PCT: 0.410 ng/mL. Then the child was discharged from hospital at the request of his parents and did not back to hospital for any physical discomfort after that. We called for a follow-up visit three days later, and his condition was very good.

Discussion And Conclusions

As a psychrophilic bacteria that exists widely in water, *A. salmonicida* is an important fish pathogen and is responsible for furunculosis. This bacterium is believed to not normally grow at the human body temperature.

A. salmonicida can rarely cause human illness from our literature search. According to the literature we searched, human diseases caused by *A. salmonicida* including bacteremia, septicemia, endocarditis, endophthalmitis, etc. [4–9]. The patients' age from 7 to 60, and the symptoms of patients include lower fever, weakness, pain, cough. There of them can be traced back to epidemiological history. The patient under two-years of age in our case is the youngest known infected person who do not have well-developed immune system, and maybe this is one of the reasons that caused his infection.

In this case, we further inquired of the child's parents about epidemiological history and possible causes of infection for the bacterial identification result. We learned that their family had gone to the beach two days before the onset of illness, the child scratched his hand by the shell, this situation did not get the parents' attention, the wound was just simply washed and bandaged.

We used cefathiamidine for empirical treatment in the early stages of the disease course, and it seemed to be effective according to the test results on the third day. Nevertheless, we later changed to ceftriaxone based on the results of the drug sensitivity test on the forth day. Signs of infection and complete relief of the child's symptoms indicate that treatment plan is correct.

This case is highly interesting since it documents *A. salmonicida* infection caused by shellfish, and the pathogen was confirmed by morphological and molecular tools. This case suggests that physicians should have a high clinical suspicion when dealing with patients with fever of unknown origin, especially when the patient has an epidemiological situation similar to the water environment or aquatic animals.

Abbreviations

A. salmonicida

Aeromonas salmonicida

WBC

white blood cell

CRP

C-Reaction-Protein

PCT

procalcitonin

MP-IgM

mycoplasma pneumoniae antibody

Declarations

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Availability of data and materials

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Authors' Contributions

PCD and WLJ carried out the case collection and laboratory detection. YMG and HCT drafted and revised the manuscript. All authors read and approved the final manuscript.

Ethics approval and consent to participate

Not applicable.

Consent for publication

We thank the patients' families for providing consent to publish this case report.

Competing interests

The authors declare that they have no competing interests.

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Tables

Due to technical limitations, table 1 is only available as a download in the Supplemental Files section.

Supplementary Files

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- [Table1.xlsx](#)