

A Case of Septicaemia Caused by *Shewanella Putrefaciens* in a 9 Month Old Infant

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Abstract

Background: *Shewanella putrefaciens* is as yet rarely responsible for clinical syndromes in humans. It is a gram negative non fermentative, oxidase positive, motile bacillus that is found mainly in marine environments. It produces hydrogen sulfide. It is a facultative anaerobe which grows quickly on both solid and liquid media. It was first isolated from dairy products in 1931 by Derby and Hammer. **Aim:** Infections with *Shewanella putrefaciens* in humans is on the rise in recent years and it mainly causes soft tissue infections, otitis media, bacteremia and pneumonia with other pathogens like *E. coli*. **Materials and Methods:** Here we report a case of septicaemia caused by *Shewanella putrefaciens* in a 9 month old infant. Blood sample was collected in paediatric blood culture broth in a ratio of 1:5 (blood: broth) and was incubated in BactT/Alert (Biomereux) and then subcultured on blood and MacConkey agar plates. The growth of gram negative, non fermentative, oxidase positive bacteria was identified as *Shewanella putrefaciens* by Microscan (Siemens) and was found to be susceptible to Amoxy/clav, cefipime, cefoperazone/sulbactam, cefotaxime, ceftazidime, ciprofloxacin, doripenem, ertapenem, imipenem/meropenem, piperacillin/tazobactam, tetracycline, ticarcillin/clavulanic acid, tigecycline and Trimethoprim/sulpha. **Conclusion:** *Shewanella putrefaciens* is as yet rarely responsible for clinical syndrome in humans. However the infection with this organism is on the rise in recent years. So attention should be devoted to unusual pathogens.

Keywords: *Shewanella putrefaciens* antibiotic susceptibility, identification, infections, septicaemia.

Introduction

Shewanella putrefaciens is a gram negative non fermentative, oxidase positive, motile bacillus that is found mainly in marine environments. It produces hydrogen sulfide. It is a facultative anaerobe which grows quickly on both solid and liquid media. It was first isolated from dairy products in 1931 by Derby and Hammer⁽⁵⁾

Shewanella putrefaciens can be found in fresh water, brackish and salt water ecosystems. Most research done on *Shewanella putrefaciens* in relation to marine life concentrates on the prevention of bacterial outbreaks in fisheries.

Shewanella putrefaciens as a human pathogen is very rare. It is typically only seen to effect in humans in combination with other bacterial infections such as *E. coli* pneumonia and *Streptococcus*^(3,3,4)

Infections from *Shewanella putrefaciens* mainly occurs in soft tissues such as skin, intraabdominal areas or in the blood^(1,2,6). It is most commonly thought of as a contaminant along with other bacteria or as a saprophyte surviving with other organisms on previously damaged tissues in the body. Here we report a rare case of septicaemia caused by *Shewanella putrefaciens* in a 9 month old infant

Case report

A 9 month old infant from a tribal village was admitted in government hospital for pyrexia of unknown origin. Clinically he had high grade fever (39.4°C), there was no organomegaly, his chest X-ray was normal and his blood reports showed a leucocyte count 29000/cumm with 85% neutrophils, platelets count 1.80 lakhs/cumm, CRP 18.6 mg/dl (N-0-6). He was empirically put on injectable antibiotics but did not show much improvement. Blood culture was received in Microbiology department of Sampurna Sodani Diagnostic Clinic, Indore a standalone diagnostic centre of central Madhya Pradesh in paediatric BacT/Alert bottle. The blood culture bottle was loaded in BacT/Alert system which indicated a growth in the bottle after 24 hours. Subculture was done on Blood agar and MacConkey Agar plates. There was a growth of motile, gram negative non fermentative, oxidase positive bacteria which was identified by MicroScan(Siemens) as *Shewanella putrefaciens*. NBP panel was used for antibiotic susceptibility testing. On review of literature⁽¹¹⁾ and according to culture and sensitivity results, therapy of our patient was changed to cefipime. Patient improved dramatically within 48 hours and was discharged on the 10th day.

Materials and Methods

Blood sample was collected in paediatric blood culture broth under aseptic precautions in a ratio of 1:5 (blood: broth) and was incubated in BacT/Alert (Biomeriux) and then subcultured on blood and MacConkey agar plates. On the basis of colony morphology, gram staining, motility NBPC panel was selected for identification and sensitivity of the micro organism. Following criteria was used for identification

Colony morphology:- small 2-3mm diameter, non lactose fermenting.

1. Grams Staining :- Gram negative bacilli,
2. Motility – motile bacteria in hanging drop preparation
3. Biochemical reaction:- performed on automated Microscan (Siemens)
4. Antimicrobial sensitivity tests:- performed on automated Microscan (Siemens)

Results

The growth of gram negative, non fermentative, oxidase positive bacteria was identified as *Shewanella putrefaciens* by Microscan (Siemens) and was found to be susceptible to Amoxy/clav, cefipime, cefoperazone/sulbactam, cefotaxime, ceftazidime, ciprofloxacin, doripenem, ertapenem, imipenemmeropenem, piperacillin/tazobactam, tetracycline, ticarcillin/clavulanic acid, tigecycline and Trimethoprim/sulpha. The MIC pattern of the antibiotics is shown in table 1

Discussion

The infection from *Shewanella putrefaciens* most commonly involves skin and soft tissue associated with damage to skin (trauma, cut, ulcer) and otitis media. Primary bacteremia with fulminant course is also seen in immunocompromised patients. The source of contamination with *Shewanella putrefaciens* in our patient could not be confirmed. However parents denied being exposed to any fresh or sea water or trauma or recent travel history. The association between a positive culture and the clinical symptoms with the improvement in clinical picture after the initiation of treatment leaves no doubt about the pathogenic character of the isolate.

Conclusion

Shewanella putrefaciens is as yet rarely responsible for clinical syndrome in humans. However the infection with this organism is on the rise in recent years causing septicaemia, pneumonia, otitis media and wound infections. So attention should be devoted to unusual pathogens.

Table 1: Antibiotic Sensitivity pattern of *Shewanella putrefaciens*

Drugs	MIC	Interpretation
Amikacin	≤16	
Amox/K Clav	≤8/4	S
Amox/K Clav	≤8/4	S
Aztreonam	8	I
Cefazolin	≤8	
Cefepime	≤8	S
Cefaperazone/Sulbactam	≤16/8	S
Cefotaxime	≤1	S
Cefotaxime/K Clavulanate	≤0.5	
Cefoxitin	>16	
Ceftazidime	4	S
Ceftazidime/K Clavulanate	≤0.25	
Cefuroxime	≤4	
Ciprofloxacin	≤1	S
Colistin	≤2	
Doripenem	≤1	S
Ertapenem	≤0.5	S
Gentamycin	≤4	
Imipenem	≤1	S
Levofloxacin	4	I
Meropenem	≤1	S
Pip/ Tazo	≤16	S
Tetracycline	≤4	S
Ticar/K Clav	≤16	S
Tigecycline	≤2	S
Trimeth/Sulfa	≤2/38	S

References

1. Mcnair, Jamilla. "Shewanella putrefaciens". "Microbe of the Week".2010 University of Missouri Biological Department.
2. Pagani, L, Lang,A, Vedovelli, C, et al.." Soft tissue infection and bacteremia caused by "Shewanella putrefaciens ". " Journal of Clinical Microbiology ".2003. Volume 41 (5).p. 2240_1
3. L.Pagani, A.Lang, C.Vedovelli, ". ." Soft tissue infection and bacteremia caused by "Shewanella putrefaciens ". " Journal of Clinical Microbiology ".Volume 41 (5).p. 2240-2241,2003 View at Publisher View at Google Scholar. View at Scopus
4. Patel Rashjrie, Abraham Albin et al- a rare case of pneumonia caused by "Shewanella putrefaciens" dept of Internal Medicine , Nassau University Medical Centre , East Meadow NY11554, USA,.
5. H.M Holt , B. Gahrn- Hansen, and B. Bruun, "Shewanella algae and Shewanella putrefaciens : clinical and microbiological characteristics," Clinical Microbiology and Infection, vol 11, no.5 , pp.347-352,2005. View at Publisher . View at Google Scholar. View at Scopus.
6. Brink, A.J.,A.van Straten and A.J van Rensburg.1995. Shewanella (Pseudomonas) putrefaciens bacteremia. Clin.Infect. Dis.20:1327-1332.
7. Chen, Y.S.,Y.C. Liu, m.y Yen, j,h Wang, J.H. Wang, S.R Wann and D.L. Cheng 1997. Skin and soft tissue manifestations of Shewanella putrefaciens infection .Clin.Infect. Dis.25:225-229.
8. Dominguez, H., B. Fonnesbech Vogel, L.Gram, S.Hoffmann, and S.Schaebel.1996. "Shewanella algae bacteremia in two patients with lower leg ulcers. Clin.Infect. Dis.22:1036-1039.
9. Khanshe, S., and J.M.Janda.1998. Biochemical and pathogenic properties of Shewanella algae and Shewanella putrefaciens . J. . Clin.Microbial. 36: 783-787.
10. Krishna Kanchan Sharma et al:- emerging infections Shewanella- A series of fine cases

- Journal of Laboratory Physicians Jul-Dec.2010.vol2, issue 2 (4 pus samples and one rectal swab).
11. Frincy and Rajesh et al : - Case report and Literature Review of carbapenem resistant *Shewanella*.
12. *Putrefaciens* isolated from Ascitic fluid Journal Clin. Res Sep.20148(91).

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