

Vibrio Metschnikovii Sepsis In A Neonate

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Abstract

Vibrio Metschnikovii is a Gram negative bacillus found in various aquatic habitats and farm animals. Human infections caused by *Vibrio Metschnikovii* are very rare and the epidemiology of the infection remains obscure. Neonatal sepsis caused by the organism is hitherto unreported.

We report the first case of neonatal *Vibrio Metschnikovii* sepsis in a five-day-old baby presenting with umbilical bleeding and lethargy.

INTRODUCTION

Vibrio Metschnikovii, a Gram negative, slightly curved bacillus, is found ubiquitously in rivers, streams, lakes, sewage, shellfish and farm animals. The mode of transmission of the infection is unknown but it is supposed to be a zoonotic. World wide, very few reports of human infection with *Vibrio Metschnikovii* have been documented till date.

CASE REPORT

Baby S, a 5 day old, 36 week preterm, male infant, born to a second gravida mother by caesarean section (Indication: Placenta previa) was admitted in our NICU with a history of bleeding from the umbilical stump site, refusal of feeds and decreased activity for a day. He cried immediately after birth and his APGAR scores were 8 at one minute and 9 at 5 minutes. His birth weight was 2.74 kg. There was no history of bleeding from any other site, abdominal distention, fever, shortness of breath or seizures.

On general physical examination, the baby was icteric upto knees and there was bleeding from the umbilicus. At admission, the baby was hemodynamically stable with normal vital signs and normal oxygen saturations in room air. Systemic examination was unremarkable. Clinical examination of the Abdomen revealed no organomegaly. Neurologically the muscle tone and reflexes were normal.

A clinical suspicion of neonatal sepsis was entertained and the neonate was investigated accordingly.

Initial Investigations revealed the following:

Figure 1

Table 1: Complete Blood Picture (CBP)

Hemoglobin %	14.6 gm / dl
Packed cell volume	43.2 %
Total leucocyte count	2,700 / mm ³
Platelet count	2.59 × 10 ⁵ / mm ³

Figure 2

Table 2: Other Relevant investigations

C Reactive Protein (CRP)	2.24 mg / dl
Prothrombin Time	15.6 seconds
Control	12.0 seconds
INR	1.30
Partial Thromboplastin Time	36.3 seconds
Control	33.4 seconds
Serum Bilirubin Total	12.92 mg / dl
Indirect	11.44 mg / dl

A sample was sent for blood culture and sensitivity and the neonate was commenced on IV antibiotics (Cefotaxime & Amikacin) and maintenance IV fluids as per the unit protocol for the treatment of neonatal sepsis.

Investigations on day 3:

Figure 3

Table 3: Relevant Investigations (CBP & CRP)

Hemoglobin %	13.7 gm / dl
Packed cell volume	40.3 %
Total leucocyte count	19,300 / mm ³
Platelet count	31,000 / mm ³
C Reactive Protein	12.26 mg / dl

Treatment Course

Stat dose of Intravenous Immunoglobulin (750 mg/kg) was administered and the antibiotics were upgraded to Piperacillin-Tazobactam & Tobramycin.

Platelet Rich Plasma was also transfused in view of thrombocytopenia.

The initial blood culture grew *Vibrio Metschnikovii* after 48 hours of incubation. The organism was sensitive to the antibiotics being administered.

A Cerebrospinal Fluid (CSF) analysis was also performed on day 5 of admission. Intravenous steroids were commenced.

Figure 4

Table 4: Cerebrospinal Fluid analysis

CSF Cell Count	90 cells / mm ³ 90 % lymphocytes
Biochemical Analysis	
Sugar	53.9 mg / dl
Protein	174.5 mg / dl
Chloride	122.5 mEq / L
Gram Stain	Occasional pus cells No organisms seen
Culture	Sterile

Cranial Ultrasonography revealed a normal study.

Course of Hospital Stay:

Thrombocytopenia and leucocytosis improved gradually over the next 48 hours.

Repeat blood culture after one week of antibiotics was sterile.

Repeat CSF analysis was also normal.

Figure 5

Table 5: Investigations on Day 8

Hemoglobin %	11.5 gm / dl
Packed cell volume	33.7 %
Total leucocyte count	13,800 / mm ³
Platelet count	3.67 × 10 ⁵ / mm ³
C Reactive Protein	4.81 mg / dl
Prothrombin Time	11.2 seconds
Control	12.0 seconds
INR	0.93
Partial Thromboplastin Time	30.6 seconds
Control	33.4 seconds

As the natural course of disease in *Vibrio Metschnikovii* sepsis is not clearly elucidated, child was given the benefit of a total of 2-week course of Intravenous antibiotics.

In order to document possible perinatal mode of transmission, maternal cervical swab and blood were sent for culture – No growth could be documented.

DISCUSSION

*Vibrio Metschnikovii*₁ is a facultative aero-anaerobic Gram negative, catalase positive bacillus with the characteristic motility of *Vibrio* species in hanging drop preparation. It has a distinct biochemical profile of a negative oxidase reaction and negative nitrate reduction in contrast to other *Vibrios*. A small amount of salt is required for its growth, which serves to differentiate it from *Vibrio cholerae*. It grows lavishly on routine culture media producing grayish, opaque colonies, 2-3 mm in diameter with complete hemolysis on Columbia sheep agar & blood agar and yellowish colonies on TCBS agar after 24 hours of incubation at 36 °C. It is identified by the VITEK 2 System with an acceptable identification index of 0.22.

Dalsgaard et al₂ described large plasmids in *Vibrio Metschnikovii*. The pathogenicity of the organism and the putative virulence factors are unknown. Miyake et al₃ described a cytolysin specific for *Vibrio Metschnikovii* with hemolytic properties, but its role in infections caused by the organism is not clear. Though the mode of transmission of the organism is unknown, isolation of the organism from aquatic habitats and farm animals, occupation of the patients and association of the bacillus with gastroenteritis suggest that the infection may be a zoonotic and can spread via food chain.

Vibrio Metschnikovii was first described in 1888, but it underwent redefinition in 1981₄ after isolation from a patient

with peritonitis and inflamed gall bladder. It was extensively characterized by Farmer et al₅ in 1988. Lee and coworkers₆ described strains from rivers, sewage, oysters and lobsters. The first case report dates back to 1981₄ when the bacillus was isolated from an 82-year-old woman with cholecystitis. One of the two cases of systemic infection with *Vibrio Metschnikovii* reported from France and Brazil in 1993 was fatal₇. In 1994₂ and 1996₈, *Vibrio Metschnikovii* was isolated from children with watery diarrhoea in Peru & Brazil respectively. One case each of postoperative wound infection₉ & pneumonia₁₀ was also reported.

We report isolation of the organism from a five-day-old neonate with clinical features suggestive of sepsis. The organism showed typical *Vibrio* like motility in hanging drop preparation. Gram's Stain preparation revealed Gram-negative, small curved bacilli. Culture produced medium to large, smooth, opaque colonies iridescent with a greenish hue on blood agar after incubation for 48 hours at 36 °C. It required small amounts of salt for growth. It was catalase positive, oxidase negative and did not reduce nitrates. The negative oxidase reaction, negative nitrate reduction and requirement of salt for growth ruled out *Vibrio cholerae*. It was differentiated from *Vibrio gazogenes* by the absence of orange red colonies. It was identified by the mini-API system [bio Merieux, 2001, France, Version-B]. It was sensitive to ampicillin-sulbactam, piperacillin-tazobactam, tobramycin, gentamicin, amikacin, imipenem, ticarcillin, ceftazidime, cefepime and meropenem.

The source of infection and the mode of transmission were not obvious. In an attempt to document possible perinatal mode of transmission, we performed maternal cervical swab culture but the swabs were sterile. The clinical features and laboratory parameters were all suggestive of a severe systemic infection. Altered coagulation profile was reported in an earlier study also₇. Isolation of the bacillus from blood may be considered as confirmatory of pathogenicity. Repeat cultures were sterile. We presume the sterile cultures to be due to the intravenous antibiotics, which the baby was administered. A CSF analysis revealed mild pleocytosis and slightly elevated protein levels but there was no definite evidence of a neuro infection. The baby was treated with IV antibiotics for 14 days. Alongside Supportive therapy like Intravenous Immunoglobulin and blood products were also

administered. There was a dramatic response to the treatment with clinical improvement and gradual normalization of the leucocyte and platelet counts, C Reactive Protein and coagulation profile. The baby is on regular follow up now and is doing well.

CONCLUSION

To the best of our knowledge, this is the first report of a Neonatal Sepsis secondary to *Vibrio Metschnikovii*. Isolation and identification of the organism may not be very difficult but still there are many a lacuna in the epidemiology and pathogenicity of the bacillus.

Though it is a rare infection, case fatalities have been reported and hence further, comprehensive studies are quintessential to reinforce our understanding of the bacillus.

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