CASE REPORT

DELFTIA ACIDOVORANS– ISOLATED FROM UMBILICAL VENOUS TIP OF A NEONATE: A CASE STUDY AND MINI-REVIEW

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ABSTRACT

Delftia acidovorans, previously known as Comamonas acidovorans is an aerobic, non-fermentative, Gram negative rod. We report a case of 2 day old male baby, delivered preterm and admitted to NICU with respiratory distress and shock. Umbilical Venous Tip culture grew *Delftia acidovorans*. It was sensitive to Amikacin, Gentamicin, Tobramycin, Piperacillin –Tazobactum, Imipenem, Meropenem. Patient was treated with meropenem, teicoplanin and fluconazole while awaiting reports for blood culture and UVL tip culture. Baby became afebrile and later was discharged. *Delftia acidovorans* is an unusual organism which has been isolated from cases of line related sepsis. Very few cases have been reported from India. To the best of our knowledge, this is the first case report from North India.

Keywords: Umbilical tip, Delftia, aminoglycosides

INTRODUCTION

Delftia acidovorans, previously known as Comamonas acidovorans is an aerobic, non-fermentative, Gram negative rod, renamed by Den Dooren de jong in 1926.[1] It is classified in the Pseudomonas rRNA homology Group III . Generally considered a non pathogenic bacteria, it has been isolated from sludge, biological wastewater treatment plants.[2,3]

A 2 day old male baby, delivered preterm at 32 wks and 2 days, was admitted to NICU with respiratory distress and shock. It weighed 1.402 kg, had severe birth asphyxia and was diagnosed with Patent Ductus Arteriosus with Atrial Septal Defect (PDA with ASD). The mother had Rheumatic Heart Disease (RHD) with pulmonary edema and gestational diabetes. Laboratory investigations revealed Hb- 9.3 gm/dl, TLC 10.3x 10^3, CRP 0.001. USG of skull done on day 16 of life showed b/l germinal matrix haemorrhage.

Initially baby was started on Inj. Ampicillin and Amikacin but condition continued to worsen. Later Inj. Meropenem, Teicoplanin and fluconazole were given which continued for total 14 days in view of persistent shock and possible sepsis. The UVL (Umbilical Venous Line) was kept till day 10 following which the patient's UVL tip were sent for pyogenic culture.

In the laboratory, samples were inoculated on 5% sheep blood agar and MaConkey agar and tip put in thioglycollate broth which was subcultured after 24 hrs. After 48 h of incubation at 37 ^{0}C in ambient air, 2-3 mm, non hemolytic, moist colonies were seen on 5% sheep blood agar and 2-3 mm, non lactose fermenting colonies were seen on MaConkey agar. It was a urease non producer, KIA was not fermented and no gas or H2S was produced. When the organism was grown on nutrient agar and Kovac's reagent was added to the media, the colonies turned orange. Identification with MICROSCAN WALKAWAY (Siemens) gave an identification of *Delftia acidovorans* with a probability level of 98%. The antimicrobial sensitivity is given in table 1.

It was presumptively identified as *Delftia acidovorans* which was confirmed using standard biochemical tests.[4] Meanwhile the baby's condition improved.

It is important to consider whether the isolated bacterium is a true pathogen of the active infection or a contaminant of the indwelling catheters.

Table 1: Pattern of Antimicrobial Sensitivity of isolates from various studies

Characteristics of AST profile of *D. acidovorans*	Shou- Kin et[11]	Lang et al[2]	Khan et al[10]	Present study	castelnoga et al[7]
Amikacin	R	R	R	S	S
Cefotaxime	R				
Gentamicin	R	R	R	S	R
Piperacillin/tazobactam	R	S		R	S
TMP/SMX	R	S		R	S
Ceftazidime	R	S	R	R	S
Imipenem	S	S	R	S	S
Meropenem	S	S	R	S	S
Levofloxacin	R	S		S	
Tobramycin	R	R	R	S	S
Piperacillin	R	-			
Ciprofloxacin	R	S		S	S
Ofloxacin	R				
Cefoperazone/sulbactam	S		S		

Table 2: Review of cases with Delftia acidovorans as the causative etiology

Year	Journal	Sample	Age	Risk factor	Treatment	Outcome	Ref
2012	IJM	intravenous catheter tip	65	NK Cell Lymphoma	Antibiotics	Discharged	2
2012	APJTB	percutaneous catheter	4	Respiratory Distress	Ceftazidime+ Amikacin	Died	10
2011	JECM	blood, urine	93	benign Prostate hyperplasia with obstructive uropathy		Discharged	11
2009	TRD	Endotracheal Aspirate	53	mass like lesion lungs	imipenem/cilastatin	Discharged	1
2011	JCM	i.v catheter		Hemodialysis	Antibiotics	Discharged	5
2012	JCM	blood , aortic valves	30	IV Drug user	Ceftriaxone	Discharged	9
Present study		UVL	2 day	Respiratory Distress	Meropenem, Teicoplanin & fluconazole	Discharged	

The microorganism was isolated from the UVL when the patient was suffering from active infection and it was the sole organism repeatedly isolated. These observations led us to believe that it was a pathogen. *D. acidovorans* was not isolated from the initial blood culture sample. It suggests that the organism was the etiologic agent of secondary infection related with a catheter rather than that of sepsis. The baby underwent endotracheal intubation and was subjected to repeated suction and aspiration to keep the airway patent. The baby was on another device namely, umbilical venous line which was maintained for upto 10 days. We presume, that the organism might have got inoculated from the environment, during this time. It has been reported that *D. acidovorans* infection is associated with exposure to contaminated venous catheters 11.[5-7] The organism was sensitive to Amikacin, Gentamicin, Tobramycin, Piperacillin – Tazobactum, Imipenem, Meropenem, Tetracycline and resistant to Ceftazidime. It was presumptively identified as *Delftia acidovorans* which was confirmed using standard biochemical tests.[4] The baby remained afebrile and was discharged the following week. At 2 months of follow up, it continues to remain healthy. *Delftia* has been reported from various specimens like blood, urine, catheter tips etc.

Table 2 gives the cases reported previously. Very few cases have been reported from India. To the best of our knowledge, this is the first case report from North India.

D. acidovorans is uncommonly encountered in clinical specimens.[7,8] Since it is regarded as an environmental organism, it is considered a nonpathogen or an organism with low virulence. However, it can be an opportunistic pathogen in bacteremia associated with vascular catheters .[5-7] In this case it caused umbilico-vesicle vasculitis which would have gone onto become CLABSI (Catheter Line Assosiated Bloodstream Infection). This strain was highly sensitive to aminoglycosides, a rare observation also reported by Castagnola et al.[6] Since *D. acidovorans* is often resistant to aminoglycosides, a class of drugs commonly used to treat systemic Gram-negative infections, timely identification of this organism to the species level is necessary to determine the most appropriate antibiotic therapy.

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