

Unusual Pathogen *Comamonas testosteroni* Sepsis Following Gastroenteritis in a 12 Months Old Child: Case Report and Literature Review

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Abstract *Comamonas testosteroni* initially has been considered as a nonpathogenic microorganism until 1987; after which year, it has been recognized as a human pathogen with spectrum of infections both in adult and children. We report the first case of a healthy child who is 12 months old Omani girl presented with features of acute gastroenteritis with *Comamonas testosteroni* sepsis, that was treated successfully with two weeks course of intravenous ceftriaxone with excellent outcome. Most of the reported cases of *Comamonas testosteroni* infection were sensitive to antibiotics with favorable outcome.

Keywords: *Comamonas testosteroni*, gastroenteritis, sepsis, child

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1. Introduction

Comamonas testosteroni is a gram-negative, motile, aerobic, Non-spore-forming bacillus. [1] Formerly known as *Pseudomonas testosteroni*. It is found in soil, plants, water saprophytes, and also may be found in humidifier reservoir water, even isolated from dromedary rumen fluid [2] It has become clinically important after 1987, when reports began accumulating on human infections such as cellulitis [4], peritonitis especially with a perforated appendix [5], bloodstream infection [6,7], infective endocarditis [8], purulent meningitis, [9] postoperative endophthalmitis [10] and hemodialysis catheter-related bacteremia [11]. However, cases of bloodstream infections caused by *Comamonas testosteroni* have been infrequently reported [12] and this is the first case reported in Oman in a 12 months old child.

In this report we presented a healthy child who is 12 months old girl presented with features of acute gastroenteritis with *Comamonas testosteroni* sepsis that was treated successfully with two weeks course of intravenous ceftriaxone with excellent outcome.

2. Case Report

A one year old girl previously well admitted with fever associated with lethargy and decreased oral intake. Fever started one week before her presentation, it was high grade, on and off, documented on admission to be 39.4. Fever responded to antipyretic medication. It was associated

with watery loose stool, which was not mixed with mucus or blood about 5-8 times per day. No history of rash, no respiratory symptoms, no abnormal movement. No history of contact with sick persons, no history of travel and no history of eating from outside.

Systemic review was unremarkable. Antenatal history was not significant apart of mother had gestational diabetes mellitus (GDM) controlled with diet. Parents are second-degree relatives, has one sibling 6 years old who is healthy. No family history of similar illness. No previous medical or surgical admissions. Developmental history, she is corresponding to her age in all parameters. Not on any medications prior to admission and had no history of allergy. Her immunization history is up to date. She was eating normal family diet and thriving well.

Clinically, when the child was initially seen in the emergency room; she was sick looking, febrile 39.4 degree Celsius, moderately dehydrated, tachycardia with heart rate of 160 beat per minutes, Blood Pressure was maintained. Liver was palpable 2 cm below costal margin, other systemic examinations were unremarkable. The initial clinical impression was gastroenteritis with moderate dehydration. She received 3 boluses of intravenous fluid of 0.9% normal saline, and then shifted to pediatric ward with impression of acute gastroenteritis and to rule out sepsis in view of high-grade fever and tachycardia for further management.

Initial blood investigations showed no leukocytosis with total white blood cells 11.4, absolute neutrophils count 5.6, platelets 409, hemoglobin: 10.8.

During her first 3 days of admission, she was managed with intravenous fluid and oral rehydration solution for her dehydration, her gastroenteritis symptoms improved

but she continued to spike high grade fever that ranged between 38-39 degree Celsius. On the third day of admission blood culture showed gram-negative bacilli. Intravenous ceftriaxone started 80 mg per kg per dose once a day. Over the next 24 hours of starting antibiotics, her spike of fever started to improve and became less frequent while diarrhea gradually decreased significantly as well.

Final report of the blood culture showed *comamonas testosteroni* sensitive to ceftriaxone, ceftazidime, cefipime, ciprofloxacin and gentamicin. Based on the sensitivity results; ceftriaxone was continued. Her symptoms improved after starting the antibiotics and the fever subsided. Blood culture was repeated 48 hours of starting antibiotics along with stool culture, which showed no growth. Child continued to improve clinically and she received ceftriaxone for total 14 days.

She was discharged in stable condition after finished ceftriaxone course for total 14 days. On subsequent follow up the child remained asymptomatic with normal activities.

3. Discussion

There are few cases of *Comamonas testosteroni* bacteremia reported in the literature. *Comamonas testosteroni* initially has been considered as a nonpathogenic microorganism until 1987; after which year, it has being recognized as a human pathogen with spectrum of infections both in adult and children [4-11].

Most reported cases have immune suppression such as malignancy [13], on hemodialysis patients, [14] alcoholic patient, patient with hepatitis B infection with liver cirrhosis and hepatocellular carcinoma [15], and cholesteatoma [16]. Our patient was absolutely healthy

and has no comorbid conditions, with no evidence of immunodeficiency.

Gastrointestinal pathologies are usually accompanied by intra -abdominal infections such as this organism, and so it is considered as a risk factor for *comamonas testosteroni* infection [17]. Our patient presented initially with viral gastroenteritis, which we believe it was the risk factor to the development of *comamonas testosteroni* sepsis.

There are 15 reported cases of *C. testosteroni* infections in pediatrics age including our patient shown in Table 1.

There are 13 reported pediatrics cases of *Comamonas testosteroni* infection. Age ≥ 10 years reported in 8 out of 13 patients. Sex distribution was almost equal with 5 female, 7 males and one stillbirth. 6 out of the 13 patients had appendicitis. Maternal intravenous drug abuse is a risk factor for newborn infection with this organism. Our patient is the first reported case of *Comamonas testosteroni* infection following acute gastroenteritis. All patients with appendicitis had a positive peritoneal or appendix sample culture. Blood culture was positive in patients with medulloblastoma, newborn babies of mother with intravenous drug abuse and in acute gastroenteritis in our patient. Antibiotics use reported in 8 patients and it include monotherapy in 3 patients and combination of more than one antibiotic in 5 cases. Ampicillin in combination with clindamycin or amikacin, cephalosporins: cefoxitin and ceftriaxone and ciprofloxacin were commonly used antibiotics. Regarding the outcome of *Comamonas testosteroni* infection; all patients recovered except one death and one still birth associated with maternal drug abuse which seems to carry a worse outcome of this infection in addition to other possible contributing factors that related to maternal drug abuse.

Table 1. Summary of pediatric reported cases of *Comamonas testosteroni* infection

Patients no	Gender/Age years	Diagnosis	Sample	Antibiotic treatment	Result	Reference
1	M/11	Appendicitis	Peritoneal fluid	Ampicillin/clindamycin and tobramycin	Recovered	Barbaro <i>et al</i> [5]
2	F/12	Appendicitis	Peritoneal fluid	Cefoxitin	Recovered	Barbaro <i>et al</i> [5]
3	F/4	Peritonitis (PD child)	Peritoneal fluid	Ciprofloxacin	Recovered	Mattia Parolin [13]
4	Newborn/Stillbirth	Maternal Intravenous drug abuse	Blood + umbilical cord	NR	Stillbirth	Barbaro <i>et al</i> [5]
5	F/newborn	Maternal Intravenous drug abuse	Blood	Ampicillin and amikacin	Dead	Barbaro <i>et al</i> [5]
6	M/10	Bacteremia	Blood	Ciprofloxacin/Amikacin	Recovered	Frashad <i>et al</i> [6]
7	M/16	Appendicitis	Peritoneal fluid	Amikacin, ampicillin, and clindamycin	Recovered	Gülsüm İclal Bayhan [7]
8	F/17	Appendicitis	Peritoneal fluid	NR	Recovered	Barbaro <i>et al</i> [5]
9	M/14	Appendicitis	Appendix	NR	Recovered	Barbaro <i>et al</i> [5]
10	M/15	Appendicitis	Appendix	NR	Recovered	Barbaro <i>et al</i> [5]
11	M/4	NR	Blood	NR	Recovered	Barbaro <i>et al</i> [5]
12	M/10	Medulloblastoma, chemotherapy	blood	Ciprofloxacin, amikacin	Recovered	Frashad <i>et al</i> [6]
13	F/1	Acute gastroenteritis /sepsis	Blood	Ceftriaxone	Recovered	(Present patient)

* M, male; F, female
NR, Not reported.

4. Conclusion

Comamonas testosteroni is a gram-negative, motile, aerobic, Non-spore-forming bacillus. It has become clinically important after 1987, when Reports began accumulating on human infections. This is the first case report of *Comamonas testosterone* sepsis in a healthy Omani child following acute gastroenteritis. It represents the potential virulence of this organism that should be considered as real pathogen rather than contaminant when isolated from a sterile body site.

References

- [1] Abraham JM, Simon GL. *Comamonas testosteroni* Bacteremia: A case Report and review of the literature. *Infect Dis Clin Pract* 2007; 15: 272-3.
- [2] Bouraoui H, Vendramin E, Squartini A, Haddi, ML. Taxonomical analysis of the suspended bacterial fraction in the dromedary rumen fluid. *African J Biotech* 2011, 30; 10(76): 17640-176442014.
- [3] Jose Orson, Polymicrobisl Bacteremia Involving *Comamonas testosteroni*, Case Report. Hindawi Publishing Corporation, Case reports in Medicine, Volume 2014, Article ID 578127, 3 pages.
- [4] Tsaob SM, Liue KS, Chenc TY, Wang YL, Teng YH, Tsuia TL, Lee YT. *Comamonas testosteroni* infection in Taiwan: Reported two cases and literature review. *Journal of Microbiology, Immunol Infect* 2011; 44(1):67-71.
- [5] Barbaro JD, Mackowiak A P, Barth SS, Southern PM Jr. *Pseudomonas testosteroni* Infections: Eighteen Recent Cases and a Review of the Literature. *Clin Infect Dis* 1987; 9 (1): 124-129.
- [6] Farshad S, Norouzi F, Aminshahidi M, Heidari B, Abdolvahab Alborzi. Two cases of bacteremia due to an unusual pathogen, *Comamonas testosteroni* in Iran and a review literature. *J Infect Dev Ctries* 2012; 6(6): 521-525.
- [7] Gul M, Ciragil P, Bulbuloglu E, Aral M, Alkis S, Ezberci F. *Comamonas testosteroni* bacteremia in a patient with perforated acute appendicitis. *Acta Microbiol Immunol Hung* 2007; 54(3): 317-321.
- [8] Coopera RG, Staples DE, Iczkowski AK, Clancy JC. *Comamonas (Pseudomonas) testosteroni* endocarditis. *Cardiovasc Pathol* 2005; 14(3):145-149.
- [9] Arda B, Aydemir S, Yamazhan T, Hassan A, Tunger A , SerterD . *Comamonas testosteroni* meningitis in a patient with recurrent cholesteatoma. *APMIS* 2003 ; 111(4): 474-476.
- [10] Reddy KA, Murthy S, draJalali S , Gopinathan U. Post-operative endophthalmitis due to an unusual pathogen, *Comamonas testosteroni*. *J Med Microbiol* 2009; 58(3): 374-375.
- [11] Nsier W, Khateeb J, Mohammad Awawdeh M, Ghali M. Catheter-related bacteremia caused by *Comamonas testosteroni* in a hemodialysis patient. *Hemodial Int* 2011; 15(2): 293-296.
- [12] Horinouchi M, Yamamoto T, Taguchi K, Arai H, Kudo T. Meta-cleavage enzyme gene tesB is necessary for testosterone degradation in *Comamonas testosteroni* TA441. *Microbiology* 2001; 147: 3367-3375.
- [13] Parolin M, Baraldi M, Valentini E, Murer L, Vidal E. *Comamonas testosteroni*-associated peritonitis in a pediatric peritoneal dialysis patient. *World J Nephrol* 2016; (2): 220-223.
- [14] Nsier W, Khateeb J, Mohammad Awawdeh M, Ghali M. Catheter-related bacteremia caused by *Comamonas testosteroni* in a hemodialysis patient. *Hemodial Int* 2011; 15(2): 293-296.
- [15] Tsaob SM, Liue KS, Chenc TY, Wang YL, Teng YH, Tsuia TL, Lee YT. *Comamonas testosteroni* infection in Taiwan: Reported two cases and literature review. *Journal of Microbiology, Immunol Infect* 2011; 44(1): 67-71.
- [16] Arda B, Aydemir S, Yamazhan T, Hassan A, Tunger A , SerterD . *Comamonas testosteroni* meningitis in a patient with recurrent cholesteatoma. *APMIS* 2003; 111(4): 474-476.
- [17] *Comamonas testosteroni* endocarditis in Turkey: A case report and review of the literature *International Medical Journal of Sifa University / May-August 2015 / Vol 2 | Issue 2.*