

***Ochromobacter anthropi* infection in soil-contaminated hip wound in the Dominican Republic**

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Abstract

Ochrobactrum anthropi, a gram-negative bacillus from the alphaproteobacterium family, is a known soil living bacteria that also happens to be a human opportunistic microorganism with low virulence. It is a challenging infection to diagnose and treat due to its similarity to other bacteria and the lack of information about its virulence factors. We report a case of a female patient who presents an infection due to *Ochrobactrum anthropi* after being hospitalized because of a motor vehicle accident.

Keywords

Ochromobacter anthropi; wound infection; gram-negative bacteria; Dominican Republic infection.

Introduction

Ochrobactrum anthropi is a nonfermenting, oxidase-positive, motile, gram-negative bacilli of the alphaproteobacterium family. Usually lives in soil, plants, nematodes, insects, animals and humans [1,2]. The name anthropi is given based on the genetic difference with other bacteria belonging to this family. This microorganism has been associated with promotion of plant growth and studies suggest probable opportunistic behavior, rarely causing human infections. Reports have been published, where *O. anthropi* was found in Cystic Fibrosis patients, associated with prosthesis, catheters, bacteremia and spontaneous peritonitis [4-7]. This bacterium is being recognized as human opportunistic pathogen [8].

Sometimes it is misdiagnosed as *Brucella spp.*, being the latter a member of the same family as *O. anthropi*. Although, these two bacteria have similarities, their wall structure is different as well as their infectivity and virulence factors. One way to differentiate both of them is by *Brucella spp.* resistance to polymyxins and also by PCR techniques, using the recA gene [3-6].

Antibiotic therapy for *O. anthropi* has not been standardized and most of the cases clinical decision is made based on case by case basis. Sometimes antibiogram is not available and among antibiotic therapy proposed for *O. anthropi* are TMP-SMX, cephalosporins, amikacin, ciprofloxacin and clindamycin [9-11].

The aim of this case report is to serve as an example to carry out other practices in future clinical scenarios and for new research regarding the virulence of this microorganism. It is of special importance that other countries with similar clinical practices and limitations as Dominican Republic are aware of the potential presentation of an infection caused by this bacterium and its possible choices for treatment.

Case Report

A 35-year-old female from The United Kingdom with past medical history of mild intermittent asthma not treated, located in Haiti due to voluntary work, weeks ago. She was brought to the hospital with history of motor vehicle accident with pelvic injury 3 days prior her admission. The accident took place in Haiti and the patient was transferred to Dominican Republic to seek for medical attention. Patient was seen in the critical care unit. At the time of her physical examination she was alert, oriented, and referring pain in her pelvic area. Vital signs were within normal limits. She had multiple lacerations throughout her body and extremities, on her head; she had a left postauricular ecchymoses. Chest tubes were placed on her thorax bilaterally, for pneumothorax. A bilateral rhonchi and crepitus was auscultated throughout her lungs, her abdomen was non-tender, on her pelvis a wound of approximately 8 cm, covered with gauze is evidenced within the left iliac region, accompanied by soil and notable gas at the moment of inspection. Iliac bone was exposed. On imaging studies: X-ray showed a fracture of the middle 1/3 of the left clavicle is observed. CT scan of the head shows a frontal and parieto-occipital hemorrhagic contusion and a CT scan of the pelvis, a left iliac bone fracture. The department of Infectious diseases was consulted for fever. Empiric antibiotic therapy was started with vancomycin and cefepime at that time and tissue cultures were properly taken. After 3 days of antibiotic therapy the patient is still febrile, inflammatory markers elevated (see table 1), and decision to add amikacin was made. Pulmonary compromise resolved, the chest tubes were removed, and the patient was transferred to a medical unit.

Tissue culture reported in day 5 identified *Ochrobactrum anthropi* without antibiotic sensitivity reported by automatic machine. At that time, the patient was afebrile, just complaining of headache. With these results, ID team changed therapy to ciprofloxacin and amikacin empirically. WBC of patient continued to rise, although she remained afebrile. By patient's request, she was discharged against medical advice on PO therapy with ciprofloxacin.

Discussion

There have not been cases of *Ochrobactrum anthropi* reported in the Dominican Republic. *O. anthropi* has previously been linked to orthopedic infections in both, immunocompromised and immunocompetent host [12-14]. It is not a surprise that this patient's wound was covered with soil initially, as she was working in the border provinces of Haiti, near Dominican Republic, which are known for their rural areas and extreme poverty. Although this patient was covered properly with broad spectrum antibiotics at

the beginning of the therapy, *O. anthropi* is not sensitive to vancomycin and cefepime which is one of the cornerstones of empiric antibiotic in Infectious Diseases and in hospital's daily practice. As seen in Table 1, at day 5 when ciprofloxacin and amikacin were administered, inflammatory markers, initially elevated, trended down and patient's clinical status improved. Leukocytosis eventually also decreased but remained high, which could be secondary to the other trauma the patient had at that time. Procalcitonin turned negative by day 10.

Table 1: Trend of blood test results by day.

Laboratories	Hospitalization days									Ambulatory
	1	2	3	4	5	6	7	10	11	
WBC (*103 Cells)	10.81	11.37	10.36	13.55	14.10	14.79	17.89	17.92	13.60	15.20
Neu (%)	84.4	84.3	89.2	87.7	87.0	86.3	77.2	86.8	79.5	80
Cr (mg/dL)	0.55		0.49	0.52	0.52	0.47	0.45	0.57		
Glucose (mg/dL)	84	166	166	123	111					
CPR (mg/L) 0.0-1.0		183.1					7.4			
ESR (mm/h) 0-20							46			
Procalcitonin (ng/mL)		7.31						<0.05		
Lactate		0.90								
Urine WBC		1-5/c								
CPK	646	444								

Antibiogram is always recommended to establish antimicrobial therapy in bacterial infections, but when limitations for the sensitivity arises (as in this case), empiric therapy with proven antimicrobials needs to be use. In Dominican Republic, due to limitations in molecular techniques for recognition of microorganisms, sensitivities and PCR for generic analysis, sometimes is necessary the use of clinical judgment and previous case reports as ally for a better patient care. For *O. anthropi*, rarely isolated in cultures, ciprofloxacin, TMP-SMX or aminoglycosides may be an acceptable choice of empiric therapy.

Acknowledgements: To Hospital General de la Plaza de la Salud for being the healthcare institution who provided care for this and many other patients; and specially to the ID department and other specialists. To Dr. Aurora Rijo, for always being so kind, hardworking, and helpful.

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Manuscript Information: Received: March 10, 2021; Accepted: May 24, 2021; Published: May 31, 2021

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Citation: Bisono-Garcia BS, Fiallo Souffront PM, Rojas R. *Ochrobactrum anthropi* infection in soil-contaminated hip wound in the Dominican Republic. *Open J Clin Med Case Rep*. 2021; 1753.

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