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CASE REPORT **OPEN ACCESS**

Leclerciaadecarboxylata: An Emerging Pathogen Among Pediatric Infections

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A B S T R A C T

Leclerciaadecarboxylata is a gram-negative bacillus of the Enterobacteriaceae family. It is arare human pathogen that is often acquired via wound and/or contact with aquatic environment.Although multiple cases of *L. adecarboxylata* infections are described in the adult population,few have been documented in pediatrics. We are presenting case of *L. adecarboxylata* infectionsin the pediatric population. These cases highlight the growing emergence of this bacterium in thepediatric population and the need to become more aware of its threat even in patients who areimmunocompetent.

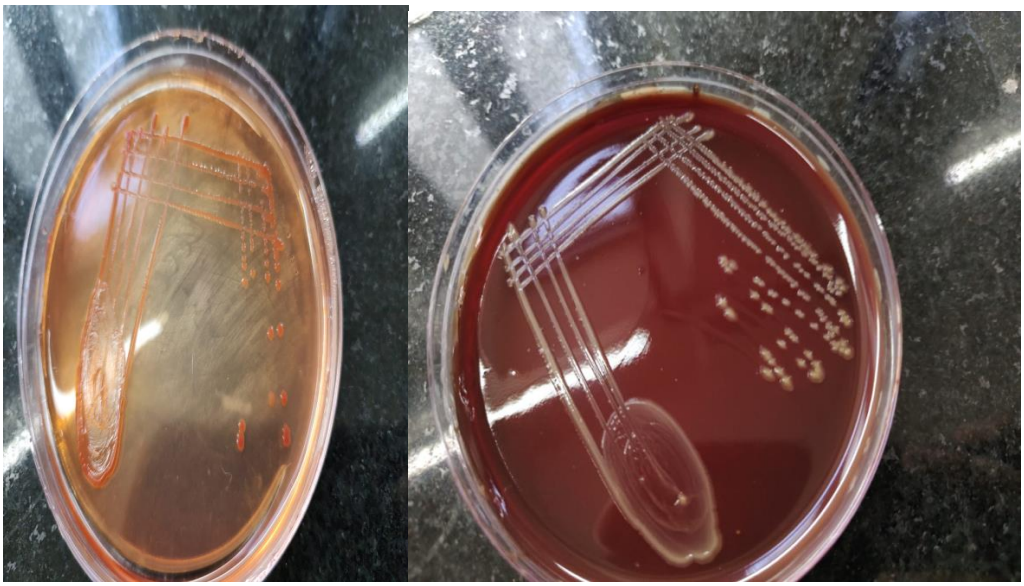
Keywords: Leclerciaadecarboxylata, pediatrics, infections, bacteria.

INTRODUCTION

Leclerciaadecarboxylata is a mobile gram-negative bacillus that is generally sensitive to most antibiotics and was first described by Leclerc in 1962 as Escherichia adecarboxylata, but was reclassified as *L. adecarboxylata* after further studies showed that it belonged to a different genus [1, 2]. It is an extremely rare human pathogen that commonly infects immunocompromised individuals, with few cases documented in adults and even fewer in pediatrics. Of the documented pediatric cases, *L. adecarboxylata* is known to cause cellulitis from wound infections and/or contact with contaminated water, consistent with multiple known cases in the adult counterpart [3, 4]. However, it has also been documented in pediatrics to cause folliculitis, peritonitis from peritoneal dialysis, and bacteremia in preterm infants and a patient with acute lymphoblastic leukemia [5, 6]. Nonetheless, compared to adults, there are fewer cases of *L. adecarboxylata* documented in pediatrics. We present the case to highlight the need for growing awareness of *L. adecarboxylata* as it is becoming an emerging infection in the pediatric population.

Case Report

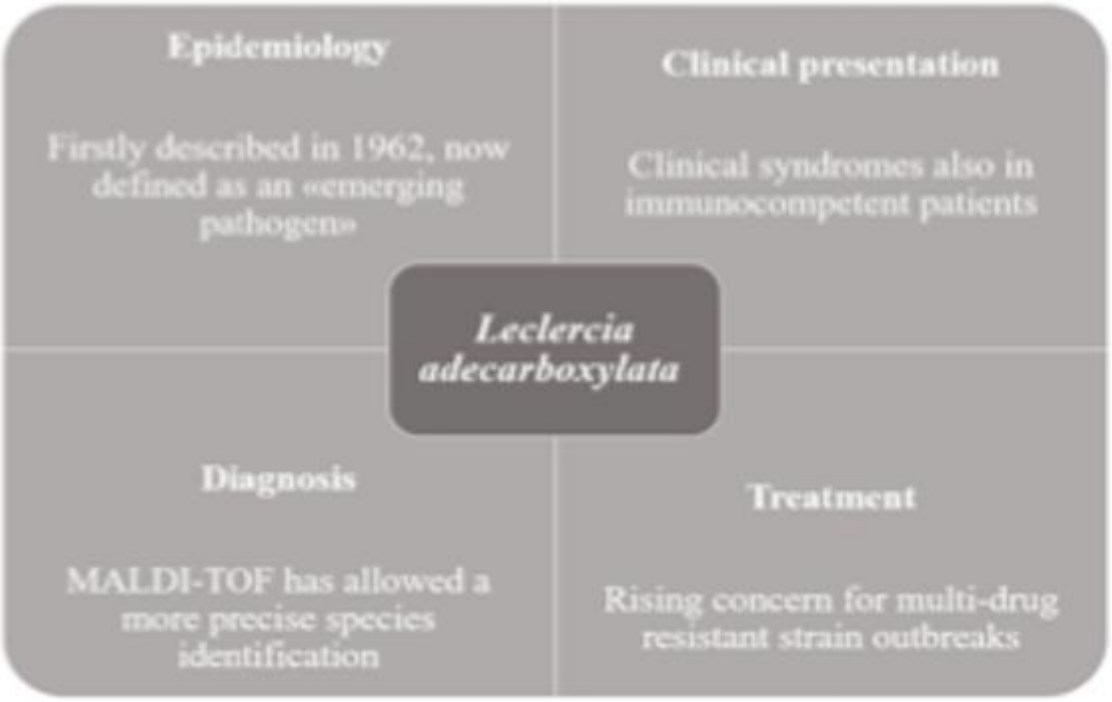
Patient name Fiza of 28 year old parity one delivered a female baby in King George Medical University (KGMU) on 23/10/2023. Birth weight of baby 2.2 kg, delivered at Barabanki via lower section caesarean method. Baby did not cry after birth and was grunting put on ventilatory support and shifted for CPAP (Continuous positive airway pressure) and then shifted to O2 hood on D11. Baby was lethargic, respiratory rate 56/min, heart rate- 132/min. Tone was increased, SpO2 94%. The baby did not cry at birth and feeble cry was noted after a few minutes. Multiple episodes of seizures occurred on day 2 of life. She was then kept on oxygen therapy for 1 day at hospital in Barabanki, a district in outskirts of Lucknow. The baby was noted of having gasping breath and was shifted to another hospital in the same area. There the baby was kept on ventilator from D2 to D7, then was shifted to CPAP from D7 to D11. She was then reintubated on D12 as the blood oxygen saturation was not maintained. Coagulation profile- Prothrombin time- 11 sec, INR- 0.97. Baby was transfused 2 RDP, 1/3 Packed RBC. Here after the patient was brought to our side on D17 as known case of congenital heart disease with pulmonary atresia along with ventilator associated pneumonia with coagulopathy with anaemia. On examination abdominal distension was present, and bilious output was found on starting feeds. The baby was referred to Paediatric surgery for further evaluation. 2D echo showed the following findings: 3mm Patent ductus arteriosus with bidirectional shunt with 6 mm atrial septal defect with moderate pulmonary arterial hypertension(48mmHg) and moderate tricuspid regurgitation. The complete blood cell count of the baby on day 17 showed the following: Hb-12.2 g/dl, TLC-14300 cells/mm3, Total RBC- 4.53 million cells/ul. On D17 endotracheal tube aspirate was sent for culture which showed that the baby had developed ventilator associated pneumonia from *Acinetobacterbaumanii*. CSF culture showed no growth of any microorganisms after 72 hours of aerobic incubation at 37 C. Treatment injection Meropenem, injection Vancomycin, Piptaz for 7 days, Amikacin 7 days, continued. Blood culture shows growth of Leclerciaadecarboxylata on both bottles. *L. adecarboxylata* is a motile, gram-negative bacterium belonging to the Enterobacteriaceae family and sharing it most of its characteristics such as facultative-anaerobic, oxidase-negative, mesophilic, peritrich-flagellated bacilli. It was further confirmed by MALDI-TOF and antibiotic susceptibility test was performed. It produces pink, glistening, low-convex, smooth, circular colony on media plates. Patient was not improving and on D37 died due to cardiac arrest.



DISCUSSION

L. adecarboxylata is a motile, gram-negative bacterium belonging to the Enterobacteriaceae family and sharing it most of its characteristics such as facultative-anaerobic, oxidase-negative, mesophilic, peritrich-flagellated bacilli [7]. It is mainly isolated from food, water and environmental sources or animal specimens but has been recognized as an emerging opportunistic pathogen. It can also be isolated from clinical specimens including blood, stool, sputum, urines and wound pus. With new identification methods such as matrix-assisted laser desorption ionization-time of flight mass spectrometry (MALDI-TOF MS), which is preferred for precise species identification over conventional methods, it is currently possible to obtain an accurate identification [8-10], of this pathogen. *L. adecarboxylata* is a 'novel' rare human pathogen, mostly affecting immunocompromised individuals or causing polymicrobial infections in immunocompetent patients. Although *L. adecarboxylata* is currently susceptible to the common antibiotics, extended-spectrum β-lactamase (ESBL)-producing strains have recently been reported. The advancements in microbiology of high-resolution methods such as MALDI-TOF MS, which led to accurate identification in early diagnosis and identification of *L. adecarboxylata* [11]. This pathogen might be isolated also from several biological specimens, such as blood culture, wound pus, faeces, urine, gallbladder, peri-ciliary and ciliary abscesses, synovial fluid, peritoneal fluid from peritoneal dialysis, sputum, cerebrospinal fluid, catheters, skin wounds, peritoneal fluid and abscesses (e.g.: peritonsillar and

periovarian) [12]. The isolates more commonly mentioned in literature usually show a high susceptibility to antibiotics and might be controlled with a variety of antibiotics, such as beta-lactams, witnessing therapeutic to therapeutic failures or needing second line treatments [13]. As previously shown despite most cases of *L. adecarboxylata*infection are susceptible to common antibiotics, some drug-resistant strains have recently been detected in literature [14]. the ability of *L. adecarboxylata*to produce biofilm remains unknown, even if the role of *L. adecarboxylata*in catheter-related bloodstream infections is increasing [15]. Particularly, specimens harbouring blaTEM-1 and blaCTX-M group 1 and intl1 genes (dfrA12-orfF-aadA2) as genetic determinants for resistance might become difficult-to-treat pathogens [16].



CONCLUSIONS

We presented the case of *L. adecarboxylata*infections in the pediatric population, who was immunocompromised born by cessarean having cardiac malformations and ventilator associated pneumonia. The baby showed no improvement and died due to multiple microbial infection and sepsis. The case highlight the emerging presence of *L. adecarboxylata*among pediatric infections and care providers should increase their awareness of this phenomenon to prevent morbidity and mortality associated with this emerging pathogen.

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