Serratia is a rare cause for endocarditis

Samer Talib,MD, Nazar Raoof, MD, Jonathan Kovacs,MD, Natalia Raoof,MD, Abdallah Khashan, MD,Vasudev Malik Daliparty,MD, Srijana Poudel,MD.

Raritan Bay Medical Center, Perth Amboy

Background

- Serratia marcescens is a Gram-negative bacillus classified as motile, non-lactose fermenting, a facultative anaerobe, motile, and oxidase-negative. Serratia marcescens can be isolated from soil, water, plants, and gut flora. Serratia is a rare cause of infective endocarditis and is responsible for 0.14% of endocarditis cases with a mortality rate of 85%.

Case presentation

A 37-year-old female with a history of IV substance abuse with heroin was admitted with fevers and dyspnea. Vital signs were BP 76/50, HR 140, RR 26, temp 102 F, and SpO2 98% on room air. She was ill and toxic-appearing. CT chest revealed multiple cavitary nodules scattered in both lungs, which were strongly suspicious for septic emboli. She was admitted to the ICU and started on norepinephrine and vasopressin for hypotension. TTE showed a large mass/vegetation on the tricuspid valve. Both blood cultures grew Serratia marcescens, following which cefepime was initiated, and the septicemia was considered secondary to tricuspid valve endocarditis. The patient then underwent TEE, which confirmed a 2.7 x 0.7 cm mass, consistent with vegetation on the tricuspid valve with severe TR. Other valves appeared normal. Left cardiac catheterization showed angiographically normal coronaries. She underwent excision of anterior and posterior tricuspid valve leaflets followed by reconstruction and ring annuloplasty. She was discharged to a rehabilitation facility. This case is unique because of tricuspid valve endocarditis, although Serratia prefers the left heart valves in all patients

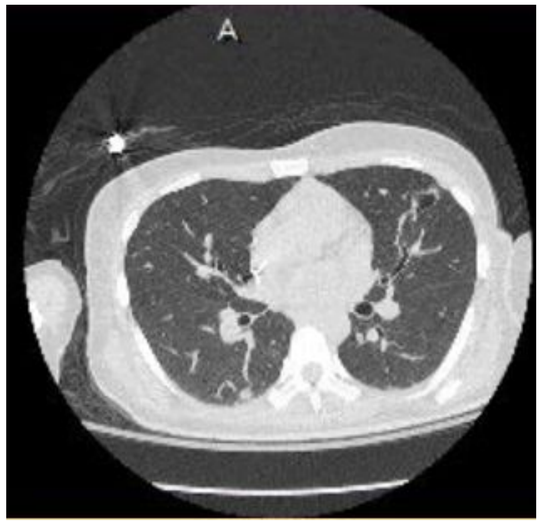
Chemistry

Na	137	136-145 mmol/L
K	2.3	3.5-5.1 mmol/L
CL	100	90-110 mmol/L
CO2	11	22-28 mmol/L
BUN	69	6-20 mg/dL
Creatinine	2.5	0.7-1.2 mg/dL
Glucose	45	70-90 mg/dL
Calicium	7.1	8.6-10.2mg/dL
Anion gab	26	9-17 mmol/L
Lactate	2.1	0.5 - 2.2 mmol/L
Troponine	<0.30	<0.30 ng/mL
ALK	353	40 - 130U/L
Total Protein	6.2	6.6 - 8.7 g/dL
Albumin	1.6	3.5 - 5.2 g/dL
ALT	7	9 - 47U/L
AST	17	12 - 40.3U/L
Bilirubin, total	1.6	0.1 - 1.2mg/dL
EGFR	28	>60mL/min/1.73m*2

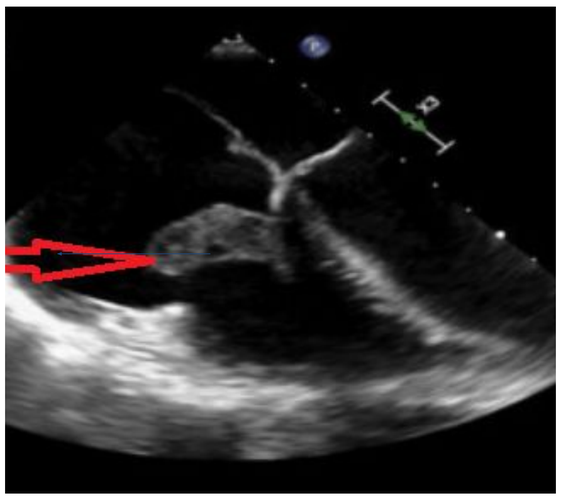
CBC with differential

HGB	5.6	11.6-16.8 g/dL
HCT	19.7	35.1-50.0 %
MCV	72.7	37.5-96.5 fL
PLT	15000	150-372 10^3/uL
RBC	2.71	3.80 - 5.60 10*6/uL
MCV	69.4	73.5 - 96.5 fL
MCH	20.7	23.9 - 33.6 pg
Red cell distribution	20	12.1-16.5%
Segmented Neurtophils, percent	81	43 - 76 %
Bands, Percent	14.0	0-6%
Neutrophils, Absolute	19.6	2.0-7.510*3/uL
Monocytes, percent	3.0	5-12 %
Lymphocytes, Absolute	0.4	0.9-2.910*3/uL
Monocytes, Absolute	0.6	0.0 - 1.010*3/uL
Nucleated RBC	2	0 %
Immature granulocytes, percent	0.3	0.0 - 1.5 %
White blood cells	26000	4-11 * 10^3

CT lung showing septic emboli



Vegetations on Tricuspid Valve



Discussion

Serratia is rare in the ICE study; out of 2.761 definite IE cases identified over five years, only 49 cases were due to gram-negative bacilli. Of those 49 cases, only four were due to Serratia. Between the years 1981-and 2007, only 19 cases of Serratia endocarditis had chronic medical conditions, with more than half of them having the involvement of the left heart valves, and more than one-fifth of them the patients died. The clinical presentation of Serratia endocarditis is similar to other infectious endocarditis. It may include constitutional symptoms, new-onset murmur, cutaneous and neurologic manifestations of IE, and/or may present with septic embolization. Serratia expresses many pathogenic factors that might be responsible for invasive infections. Serratia produces LPS, a pore-forming hemolysin known as ShlA also various adhesion molecules like mannose sensitive and mannose resistant pilli. These pathogenic factors allow Serratia to result in valvular destruction and paravalvular complications. Serratia is difficult to treat, and studies have shown that it is resistant to 1st and 2nd-generation cephalosporin because it is capable of massive production of chromosomal AmpC cephalosporinases and reducing outer membrane permeability along with synthesizing β-lactamases enzymes. However, Serratia can be sensitive to third and fourth-generation cephalosporins, monobactams, carbapenems, fluoroquinolones, and aminoglycosides.

Conclusions

- Serratia is a rare cause for infective endocarditis in IVDU with a predilection for the left heart valves and it is invasive associated with valvular destruction and paravalvular complications it can be sensitive to cephalosporins.

References

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