

An Unusual Case of Early Onset Persistent *Escherichia coli* Septicemia Associated with Endocarditis

Sachin K. Gupta, MD¹ Vishakha Nanda, MD¹ Prashant Malviya, MD¹ Norman Jacobs, MD¹
Z. Naheed, MD¹ Tessy Joseph, MD¹

¹Department of Pediatrics, John H. Stroger, Jr. Cook County Hospital, Chicago, Illinois

Address for correspondence Sachin Kumar Gupta, MD, 1901 W. Harrison Street, Chicago, IL 60612 (e-mail: drsachin.apollo@gmail.com).

Am J Perinatol Rep 2013;3:105–106.

Abstract

Keywords

- ▶ *Escherichia coli*
- ▶ endocarditis
- ▶ early onset septicemia
- ▶ newborn

Escherichia coli infection is very common cause of early onset septicemia especially in very low-birth-weight newborns, but *E. coli* endocarditis has not been described in newborns. *E. coli* endocarditis, even in the adult population, is a rare and not well-characterized disease and is associated with high mortality. We report a very unusual presentation of persistent *E. coli* infection associated with endocarditis.

A term, male, small-for-gestational age infant was born to a 27-year-old Hispanic woman at 40 weeks' gestational age through normal spontaneous vaginal delivery. He received routine care after birth. Apgar scores were 9 and 9 at 1 and 5 minutes of age. The mother had an uneventful prenatal course, all prenatal laboratory values were unremarkable including group B streptococcal screen, and she had no maternal risk factor for infection.

The baby was transferred to the nursery in view of desaturations and oxygen requirement. On physical examination, he was noted to have dysmorphic facies (microcephaly, microstomia, micrognathia, and overriding sutures) and congenital anomalies including overlapping index finger on both hands, second and third toe syndactyly, and rocker bottom feet on both side. The anthropometric measurements were as follows: birth weight 2,560 g (< 3rd percentile), head circumference 34.5 cm (10th to 25th percentile), and length 46.5 cm (< 3rd percentile). The cardiovascular exam was remarkable for grade 2 systolic murmur. The respiratory, abdominal, and skin exam revealed normal findings. He was started on first-line antibiotics (ampicillin and gentamicin) on day 2 for persistent oxygen requirement, apnea, and abdominal distension, after evaluation for sepsis including

blood and cerebrospinal fluid culture. The laboratory studies showed a white cell count of 23,600/mm³ with 59% neutrophils, 21% bands, 11% lymphocytes, hematocrit of 37%, and platelets count of 144,000/mm³. The chest X-ray done showed normal cardiothymic silhouette with perihilar infiltrates on the left side.

Genetic karyotyping was obtained. The echocardiogram showed moderate-sized *patent ductus arteriosus* with left-to-right shunt and two small *ventricular septal defects* in perimembranous and muscular septum. The head ultrasound was remarkable for increased echogenicity in the posterior fossa brain parenchyma, which showed improvement on later head ultrasound. The renal ultrasound was unremarkable. The blood culture was positive for *Escherichia coli* pan-sensitive to all antibiotics. Lumbar puncture showed normal cell count and raised proteins (259 mg/dL). Initial urine culture showed no growth. Repeated blood cultures on days 5 and 7 again showed growth of pan-sensitive *E. coli*. A pediatric infectologist was consulted and antibiotics were changed. The well-placed peripherally inserted central catheter (PICC) line (placed on day 4 in the right cephalic vein) was removed on day 7 because of concern it might be acting as a nidus for infection. The PICC line tip culture remained negative. The

received
January 14, 2013
accepted after revision
May 22, 2013
published online
July 11, 2013

DOI <http://dx.doi.org/10.1055/s-0033-1349346>.
ISSN 2157-6998.

Copyright © 2013 by Thieme Medical Publishers, Inc., 333 Seventh Avenue, New York, NY 10001, USA.
Tel: +1(212) 584-4662.

License terms



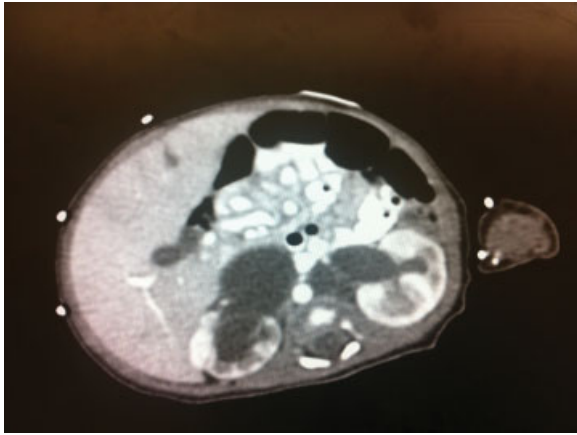


Fig. 1 Computed tomography scan of abdomen showing bilateral severe hydronephrosis, more on right side.



Fig. 2 Echocardiogram showing vegetation (9 × 3 mm) at superior vena cava and right atrium junction. Abbreviations: LA, left atrium; RA, right atrium; SVC, superior vena cava.

patient was given six platelet transfusions during the first week for persistent thrombocytopenia. Repeat urine culture showed no growth. Total immunoglobulin levels were within normal limits, ruling out primary immunodeficiency disease.

Computed tomography scan of the abdomen was ordered to look for the focus of infection and was remarkable for bilateral severe hydronephrosis, worse on the right, and bibasilar-dependent atelectasis (►**Fig. 1**). Repeat echocardiogram, to rule out endocarditis, was remarkable for vegetation (9 × 3 mm) at the superior vena cava and right atrium junction (►**Fig. 2**). Antibiotics were continued for 28 days. The repeat blood cultures were negative. Karyotyping was positive for trisomy 18.

Discussion

The following features in our patient led us to the diagnosis of *E. coli* endocarditis: (1) persistent *E. coli* bacteremia; (2) echocardiographic evidence of vegetation; (3) the presence of risk factors for endocarditis—high-flow jet lesions (ventricular septal defect and patent ductus arteriosus), central venous catheter, and bilateral hydronephrosis predisposing to urinary tract infection and endocarditis. Although both urine cultures were negative, they were tested after initiation of antibiotics.

E. coli endocarditis, a rare and poorly characterized disease even in the adult population, has not been described in the pediatric and neonatal age group. In adults, it has been mainly described in several small case series.^{1–5} The other risk factors associated with *E. coli* endocarditis in the adult population are injection drug use, diabetes, underlying heart disease, and prosthetic valves.^{1–5} The mortality associated with *E. coli* is reported to be high, ranging from 17 to 53% in reported series.^{6,7}

Conclusion

We describe the first case of neonatal *E. coli* endocarditis, a rare occurrence associated with high mortality (18 to 57%). Our patient had trisomy 18 with associated congenital heart and kidney lesions, predisposing him to endocarditis. The high index of suspicion and appropriate selection of antibiotics for gram-negative bacteremia, bearing in mind the ampicillin-resistant *E. coli*, before culture and sensitivity report, and timely echocardiogram to rule out the rare occurrence of endocarditis in a persistently bacteremic newborn can significantly improve outcome in these infants.

References

- 1 Komshian SV, Tablan OC, Palutke W, Reyes MP. Characteristics of left-sided endocarditis due to *Pseudomonas aeruginosa* in the Detroit Medical Center. *Rev Infect Dis* 1990;12:693–702
- 2 Levine DP, Crane LR, Zervos MJ. Bacteremia in narcotic addicts at the Detroit Medical Center. II. Infectious endocarditis: a prospective comparative study. *Rev Infect Dis* 1986;8:374–396
- 3 Wieland M, Lederman MM, Kline-King C, et al. Left-sided endocarditis due to *Pseudomonas aeruginosa*. A report of 10 cases and review of the literature. *Medicine (Baltimore)* 1986;65:180–189
- 4 Mills J, Drew D. *Serratia marcescens* endocarditis: a regional illness associated with intravenous drug abuse. *Ann Intern Med* 1976;84:29–35
- 5 Cooper R, Mills J. *Serratia* endocarditis. A follow-up report. *Arch Intern Med* 1980;140:199–202
- 6 Branger S, Casalta JP, Habib G, Collard F, Raoult D. *Escherichia coli* endocarditis: seven new cases in adults and review of the literature. *Eur J Clin Microbiol Infect Dis* 2005;24:537–541
- 7 Harries GE, Burtenshaw JML. Acute infective endocarditis due to *Bacterium coli*. *Lancet* 1937;2:803–804