

Haemophilus influenzae Bacteremia Complicating Cholecystitis

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Cholecystitis is commonly encountered in clinical practice and may be complicated by systemic infection with enteric gram-negative bacilli or anaerobes. *Haemophilus influenzae*, a gram-negative coccobacillus, typically causes infections of the upper and lower respiratory tract, often in patients with underlying systemic illness.¹ *H. influenzae* rarely causes biliary tract infection, with only a handful of cases reported in the literature.²⁻⁶ Bile may provide growth factors that support the growth of *H. influenzae*. Adult cases of *H. influenzae* bacteremia typically complicate pneumonia, or less commonly, epiglottitis or sinusitis.^{1,2} Unusual sources of adult *H. influenzae* bacteremia include meningitis, endocarditis, tuboovarian abscess, cellulitis, and septic arthritis.^{2,3} This article describes an elderly woman who presented with fever and hypotension and was found to have *H. influenzae* sepsis complicating cholecystitis.

CASE PRESENTATION

Initial Presentation and History

An 82-year-old woman with type 2 diabetes mellitus presented to the emergency department with fever, chills, fatigue, and anorexia. The patient felt unwell for several days and spent much time in bed due to severe malaise. She noted night sweats and rigors, and her serum glucose levels were elevated in the 200 mg/dL range during this time period. She denied cough, sputum production, dyspnea, abdominal pain, vomiting, diarrhea, or other abdominal complaints.

Work-up and Clinical Course

The patient was pale and appeared toxic. Vital signs were: temperature, 102.1°F; heart rate, 116 bpm; blood pressure, 72/40 mm Hg; and respiratory rate, 16 breaths/min. Physical examination was remarkable for a large, firm, nontender mass in the right mid-abdomen. The patient's white blood cell count was $13.4 \times 10^3/\mu\text{L}$ (normal, $4-10 \times 10^3/\mu\text{L}$) with 26% band forms; serum glucose was 220 mg/dL. The patient was given intravenous insulin, crystalloids, and ampicillin-sulbactam, and she experienced interval improvement. Computed tomography scan of the abdomen revealed

a thick-walled gallbladder measuring 13 cm in cranio-caudal dimension and 9 cm in transverse dimension. The following day, 2 sets of blood cultures revealed *H. influenzae*, which were proven to be β -lactamase negative and ampicillin-susceptible. The patient improved hemodynamically and an open cholecystectomy was performed without complication on hospital day 3. The surgeon noted a very large gallbladder extending to the pelvic brim with pericholecystic adhesions and extensive cholelithiasis. Biliary cultures obtained during surgery were sterile as were urine cultures (possibly due to earlier antibiotic administration). Because there was no other focus of active infection, the gallbladder was presumed to be the cause of bacteremia. The patient was treated with ampicillin-sulbactam for 10 days and was discharged without incident.

DISCUSSION

Bacteremia caused by *H. influenzae* is uncommon in adult patients and usually results from a respiratory infection (eg, pneumonia) in patients with underlying lung disease.¹⁻³ Biliary infection with *H. influenzae* is exceedingly rare, with only 6 cases reported in the literature.²⁻⁶ Most cases occurred in patients older than age 65 years^{2,5,6} and often were associated with an underlying illness, such as ethanol abuse² or malignant biliary disease.⁴ Bacteremic *H. influenzae* pneumonia occurs in the setting of chronic disease, such as cardiomyopathy, cancer, alcoholism, and diabetes mellitus.² Whether diabetes predisposes to *H. influenzae* infection is not established in the literature, but hyperglycemia is known to impair phagocyte function and chemotaxis of neutrophils, which may increase the risk of bacteremia in this population.⁷ As well, the addition of insulin to diabetic neutrophils in vitro improves their bactericidal function.⁷

The etiology of *H. influenzae* biliary infection is unclear but may be related to bacteremic colonization of gallstones from a previous respiratory infection or

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gastrointestinal tract involvement through respiratory-gastrointestinal colonization with subsequent ascent through the biliary tree.^{2,6} The case patient did not report any respiratory symptoms, although this does not exclude a recent subclinical respiratory infection. Bile may provide a hospitable environment for *H. influenzae* because it contains factor X (hemin) and factor V (nicotinamide adenine dinucleotide), essential nutrients for growth of *H. influenzae*.^{2,6,8}

Treatment of *H. influenzae*-related biliary infection requires appropriate antibiotics and surgical or percutaneous drainage in cases of cholecystitis or cholelithiasis.^{2-6,8} Broad-spectrum antimicrobials with activity against β -lactamases should be initially administered while awaiting susceptibility reports.⁸

CONCLUSION

H. influenzae is typically associated with respiratory tract infections, such as epiglottitis, bronchitis, or pneumonia, and often occurs in patients with underlying pulmonary disease. However, clinicians should consider the biliary tract as a potential source for *H. influenzae* bacteremia if there is no evidence of infection involving the respiratory system. **HP**

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