

Bacterial Cholangitis, Cholecystitis, or both in Dogs

A. Tamborini, H. Jahns, H. McAllister, A. Kent, B. Harris, F. Procoli, K. Allenspach, E.J. Hall, M.J. Day, P.J. Watson, and E.J. O'Neill

Background: Bacterial cholangitis and cholecystitis are rarely reported, poorly characterized diseases in the dog.

Objectives: To characterize the clinical features of these conditions.

Animals: Twenty-seven client-owned dogs with bacterial cholangitis, cholecystitis, or both.

Methods: Multicenter, retrospective cases series of dogs with bacterial cholangitis, cholecystitis, or both, presenting January 2000 to June 2011 to 4 Veterinary Schools in Ireland/United Kingdom. Interrogation of hospital databases identified all cases with the inclusion criteria; histopathologically confirmed cholangitis or cholecystitis and bile culture/cytology results supporting a bacterial etiology.

Results: Twenty-seven dogs met the inclusion criteria with approximately 460 hepatitis cases documented over the same study period. Typical clinical pathology findings were increases in liver enzyme activities (25/26), hyperbilirubinemia (20/26), and an inflammatory leukogram (21/24). Ultrasound findings, although nonspecific, aided decision-making in 25/26 cases. The most frequent hepatobiliary bacterial isolates were *Escherichia coli* (n = 17; 16 cases), *Enterococcus* spp. (n = 8; 6 cases), and *Clostridium* spp. (n = 5; 5 cases). Antimicrobial resistance was an important feature of aerobic isolates; 10/16 *E. coli* isolates resistant to 3 or more antimicrobial classes. Biliary tract rupture complicated nearly one third of cases, associated with significant mortality (4/8). Discharged dogs had a guarded to fair prognosis; 17/18 alive at 2 months, although 5/10 re-evaluated had persistent liver enzyme elevation 2–12 months later.

Conclusion and Clinical Significance: Bacterial cholangitis and cholecystitis occur more frequently than suggested by current literature and should be considered in dogs presenting with jaundice and fever, abdominal pain, or an inflammatory leukogram or with ultrasonographic evidence of gallbladder abnormalities.

Key words: Canine; Cholangiohepatitis; Hepatitis; Liver disease.

Main Points:

- Most bacterial cultures from biliary tree are MDR *E. coli* or *Enterococcus* spp
- Always culture gall bladder wall if possible - better than bile and much better than liver
- Long term prognosis can be okay, but some patients can have recurrent/persistent signs long term

- Previous Retrospective study showed that 13/46 bile samples from dogs yielded positive bacterial cultures
 - Cholecystitis, 62% (8 of 13)
 - patients with hepatic inflammation, 23% (7 of 30) had positive bile cultures, whereas only 6% (6 of 103) had positive hepatic cultures
 - *Escherichia coli*, *Enterococcus* spp., *Bacteroides* spp., *Streptococcus* spp., and *Clostridium* spp. were the most common true-positive isolates
- This study showed a higher prevalence of culture positive cases of cholangitis/cholecystitis in dogs presenting for hepatitis (6% of hepatitis cases)
 - Many limitations to this study:
 - Inclusion criteria included culture positive therefore we do not not true prevalence
 - Only patients that had ultrasound changes consistent with cholangitis/cholecystitis had sampling, so cannot say if bacteria present in patients without inflammation
 - Historic data says that normal dogs may have bacteria sometimes
- Results

- Most dogs have inflammatory leukogram
- Most dogs have increased t-bili
- Most dogs have vomiting (24/27), anorexia (19/27), leth (18/27), diarrhea (12/27), *pyrexia (9/27)*
- *Escherichia coli* (n = 17 isolates in 16 cases), *Enterococcus* spp. (n = 8 isolates in 6 cases of which 4 were specifically speciated as *Enterococcus faecalis*), and *Clostridium* spp. (n = 5 in 5 cases of which 4 were specifically speciated as *Clostridium perfringens*). Other isolates included untyped coliforms (4), *Enterobacter cloacae* (1), *Klebsiella* sp. (1), *Proteus* sp. (1), *Bacteroides* sp. (1), a Gram-negative bacillus, and an untyped anaerobe.
 - Sixteen of these isolates were *E. coli*, of which 10/16 showed resistance to 3 or more classes of antimicrobials.
 - All of the *Enterococcus* spp. isolates showed resistance to several agents
- Culture was best from wall of gallbladder > bile > liver
- 21/27 dogs had surgery

Prognosis

- Overall, 21/27 dogs were discharged
 - Short term (1-2 months): 10/18 cases normal, 5/18 persistent clinical signs, 2/18 laboratory abnormalities, 1/18 dead
 - Long term (1-3 years): 6/11 alive at 3 years
- 1 euth without treatment
- 5 died/euth perioperatively
- Paper goes not give medical vs surgical outcomes >:-(

Questions:

1. What are the two routes that bacteria can make their way to the biliary tree?
2. True/False: Most bacterial cholecystitis are simple infectious susceptible to most antibiotics
3. Which is the correct order when ranking the sensitivity of bacterial cultures when attempting to evaluate for bacterial cholangitis (from most sensitive to least):
 - a. Liver, bile, gall bladder wall
 - b. Gall bladder wall, liver, bile
 - c. Bile, gall bladder wall, liver
 - d. Gall bladder wall, bile, liver

Answers:

1. What are the two routes that bacteria can make their way to the biliary tree?
 - a. Via portal blood and secreted into bile
 - b. Retrograde up bile ducts

2. True/**False**: Most bacterial cholecystitis are simple infectious susceptible to most antibiotics

3. Which is the correct order when ranking the sensitivity of bacterial cultures when attempting to evaluate for bacterial cholangitis (from most sensitive to least):
 - a. Liver, bile, gall bladder wall
 - b. Gall bladder wall, liver, bile
 - c. Bile, gall bladder wall, liver
 - d. **Gall bladder wall, bile, liver**