



# Use of Antibiotics in Acute Pancreatitis at Two Tertiary Care Hospitals



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## Background

- Acute pancreatitis, commonly caused by alcohol use or gallstone obstruction, affects 15,000 Canadians annually
- Acute pancreatitis is associated with a mortality of an average of 30% if sterile necrosis becomes infected
- Prophylactic antibiotics have been studied in acute pancreatitis as a way to reduce complications of infected necrosis and mortality but recent studies have not shown a benefit
- Current Canadian and American clinical guidelines recommend antibiotics for treatment of suspected or confirmed infection in acute pancreatitis, and recommend against use of antibiotics for prophylaxis of infection

## Objectives

- To determine whether patients admitted to two tertiary care hospitals with acute pancreatitis received appropriate antibiotic therapy for a pancreatic indication
- To develop suggestions to reduce unnecessary antibiotic use

## Methods

- Design:** Multi-centre, retrospective chart review
- Sample:** random sample of 100 patients (50 per site)
- Inclusion:** Adults  $\geq 18$  years, diagnosis of acute pancreatitis, admitted to RCH or SMH  $\geq 24$ h, discharged between April 28, 2015 - May 31, 2016, inclusive. If patient had  $>1$  admission, only one admission included
- Exclusion:** Patient transferred from another hospital, patients' chart not available for review
- Primary outcome:** Patients who received antibiotics for acute pancreatitis  $\geq 24$  hours without an indication
- Secondary outcomes:** Antibiotics for prophylaxis, inappropriate empiric antibiotic  $\geq 24$ h, carbapenem use without indication, duration of antibiotics, fungemia, *C.Difficile* infection, surgery, critical care admission, mortality

## Definitions

- Antibiotics indicated: in confirmed pancreatic infection or initiated empirically in suspected infection and discontinued within 24 hours following negative cultures, imaging and absence of signs/symptoms of infection. Antibiotics are not indicated for prophylaxis of pancreatic infection.
- Carbapenems indicated: in severe sepsis or septic shock, suspected ESBL or history of ESBL infection, CNS infection, febrile neutropenia, or contraindications to alternate broad-spectrum agents

Characteristic	All Patients N=100 (%)	RCH N=50 (%)	SMH N=50 (%)
Mean age $\pm$ SD (years)	57 $\pm$ 16	59 $\pm$ 15	54 $\pm$ 17
Male gender	57 (57)	24 (48)	33 (66)
Hospital length of stay (days)			
Mean $\pm$ SD	7.9 $\pm$ 12.1	8.0 $\pm$ 10.4	7.8 $\pm$ 13.6
Median (IQR)	4.2(2.7-7.0)	4.5(2.6-6.5)	3.9(2.8-7.4)
Necrotizing pancreatitis	8 (8)	3 (6)	5 (10)
Necrosis $\geq 30\%$	2 (2)	1 (2)	1 (2)
% Necrosis unknown	6 (6)	2 (4)	4 (8)
Etiology			
Gallstone	25 (25)	13 (26)	12 (24)
Alcohol	24 (24)	8 (16)	16 (32)
Post-ERCP	11 (11)	10 (20)	1 (2)
Idiopathic/unclear	36 (36)	16 (32)	20 (40)
Other	4 (4)	3 (6)	1 (2)

Table 1: Patient Baseline Characteristics  
Reported as No. (%) unless otherwise specified

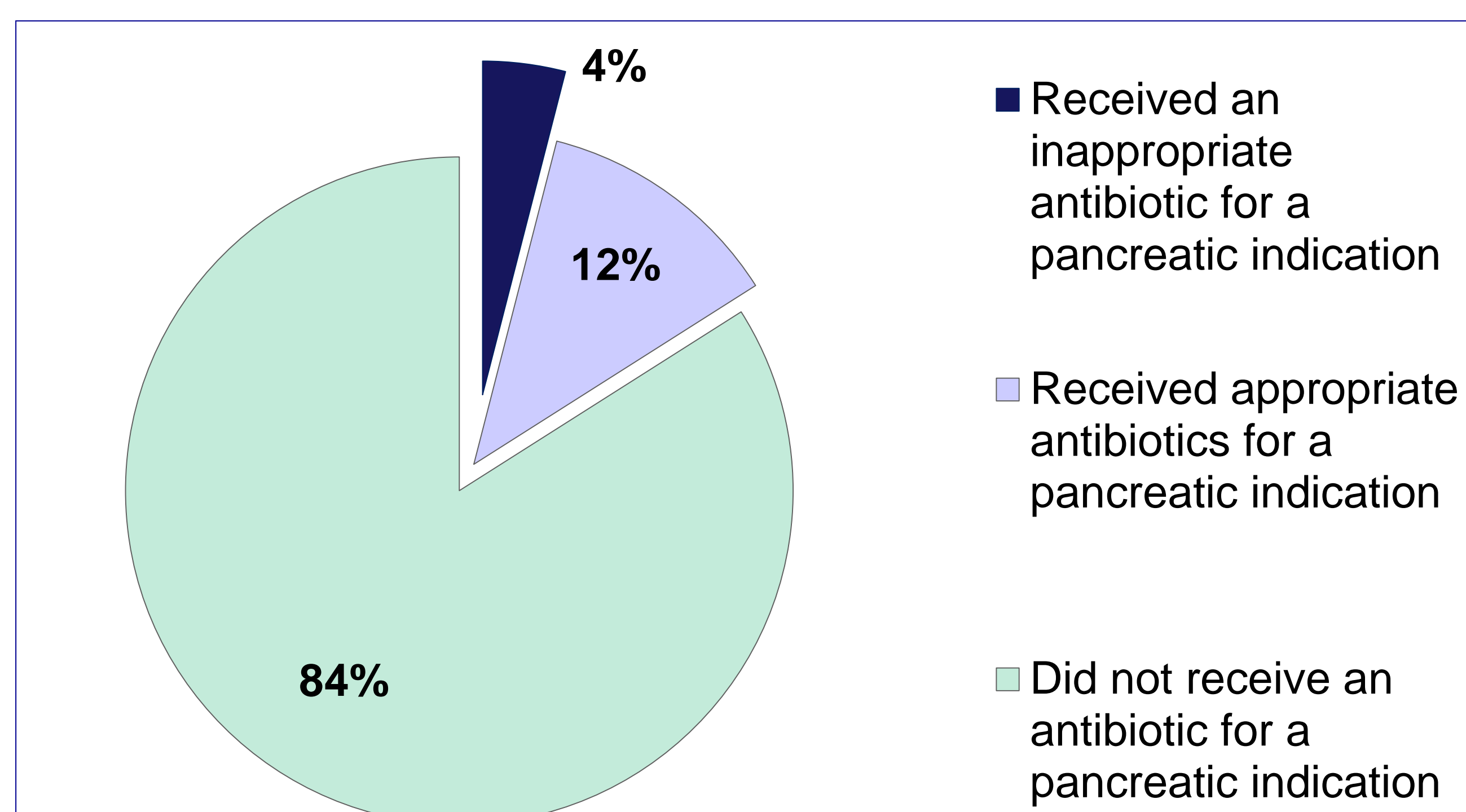


Figure 1: Proportion of patients who received an antibiotic for acute pancreatitis  $\geq 24$  hours without an indication at any time during hospital stay

## Results

Outcome – Proportion of Patients	All Patients N=100 (%)	RCH N=50 (%)	SMH N=50 (%)
Received an antibiotic for prophylaxis of pancreatic infection	1 (1)	1 (2)	0 (0)
Empiric antibiotic continued without an indication $\geq 24$ h for acute pancreatitis <sup>A</sup>	3 (3)	1 (2)	2 (4)
Received a carbapenem antibiotic $\geq 24$ h for acute pancreatitis without an indication	5 (5)	1 (2)	4 (8)
	[N=16]	[N=9]	[N=7]
Duration of antibiotic use (days)			
Mean $\pm$ SD	6.7 $\pm$ 7.3	5.0 $\pm$ 4.2	9.0 $\pm$ 10.0
Median (IQR)	5.1 (2.5 -7.3)	3.7 (1.1-7.0)	5.5 (3.7-8.5)

Table 2: Secondary Outcomes

<sup>A</sup>Despite negative cultures/imaging, and absence of signs/symptoms of infection  
Reported as No. (%) unless otherwise specified

- Sixteen patients (16%) received an antibiotic for a pancreatic indication
- Nine patients (9%) received a carbapenem for a pancreatic indication
- Two patients (2%) had an admission to a critical care unit for pancreatitis
- Seven patients (7%) underwent surgical intervention during admission
- No incidents of fungemia, *C. difficile* infection or mortality during admission

## Discussion

- Majority of inappropriate antibiotics were due to empiric antibiotics continued after negative investigations for infection
- Potential to reduce inappropriate antibiotic use through: daily reassessment of antibiotics, education on appropriate indications for carbapenems, appropriate source control, and obtaining pancreatic drain or aspirate cultures to confirm infection

## Limitations

- Retrospective chart review
  - Difficult to assess appropriateness of antibiotics and prescriber intention through chart documentation
- Small sample size
- Due to local practice, difficult to confirm infected pancreatic necrosis

## Conclusions

- 4% of patients admitted with acute pancreatitis received inappropriate antibiotics
- Further interventions are required to reduce use of inappropriate antibiotics in acute pancreatitis