Tables

Table 1. Baseline characteristics (per patient), n=115

Characteristic	Non-antibiotic-resistant bacterial infection/culture negative	Antibiotic-resistant bacterial infection	p-value
N	82	33	-
Male gender	57 (69.5%)	21 (63.6%)	0.66
HCV infection or HCV + ETOH liver disease	69 (84.1%)	24 (72.7%)	0.19
Age	54.4 ± 10.2	58.6 ± 10.3	0.07
Diabetes	26 (31.7%)	13 (39.4%)	0.52
HIV infection	3 (3.7%)	0 (0%)	0.56
Nosocomial infection	12 (14.6%)	22 (66.7%)	0.001
On beta-blockers	37 (45.1%)	17 (51.5%)	0.54
On proton pump inhibitors	43 (52.4%)	24 (72.7%)	0.06
On lactulose	45 (54.9%)	21 (63.6%)	0.41
Antibiotics within 30 days of bacterial infection (oral non-absorbed or systemic)	39 (47.6%)	29 (87.9%)	0.001
Antibiotics within 30 days of bacterial infection • No antibiotic • Oral non-absorbed antibiotic • Systemic antibiotic	 43 (52.4%) 25 (30.5%) 14 (17.1%)	 4 (12.1%) 2 (6.1%) 27 (81.8%)	0.001
Type of bacterial infection • Spontaneous infections (SBP, SBE, bacteremia) • UTI • Pneumonia • Other	 31 (37.8%) 17 (20.7%) 20 (24.4%) 14 (17.1%)	 9 (27.3%) 20 (60.6%) 2 (6.1%) 2 (6.1%)	0.001

White blood cell count	7.8 ± 5.1	9.1 ± 8.9	0.83
Platelet count	107.4 ± 79.2	88.5 ± 52.9	0.32
Albumin (g/dL)	2.8 ± 0.7	3.2 ± 0.8	0.01
Bilirubin (mg/dL)	6.5 ± 8.5	13.2 ± 14.9	0.02
INR	1.6 ± 0.5	1.8 ± 0.6	0.06
Creatinine (mg/dL)	1.4 ± 1.0	2.4 ±1.4	0.001
Sodium (mEq/L)	131.2 ± 15.3	135.4 ± 7.1	0.06
Child Pugh score	9.0 ± 1.5	10.1 ±1.4	0.001
MELD score	19.5 ± 9.4	26.5 ± 9.8	0.001

Table 2. Organisms isolated in culture-positive infections (first infection per patient), n=70

	UTI	SBP/SBE	Spontaneous bacteremia	Pneumonia	Other
	n=37	**n=13**	**n=10**	**n=6**	**n=4**
Gram negative bacilli					
B-lactam susceptible *Escherichia coli*	10* (4QR,0CR)	2 (1QR,0CR)			
ESBL producing *Escherichia coli*	2 (2QR,2CR)	1 (1QR,1CR)			
B-lactam susceptible *Klebsiella pneumoniae*	6 (2QR,0CR)	2 (0QR,0CR)	1 (0QR,0CR)	2	
ESBL producing *Klebsiella pneumoniae*	2* (1QR,2CR)	1 (1QR,1CR)		1	1
B-lactam susceptible *Pseudomonas aeruginosa*	1 (0QR,0CR)				
ESBL producing *Pseudomonas aeruginosa*	1 (1QR,1CR)				
B-lactam susceptible *Citrobacter freundii*	1 (0QR,0CR)	1 (0QR,0CR)			
B-lactam susceptible *Enterobacter aerogenes*		1 (0QR,0CR)			
Proteus mirabilis	1 (0QR,0CR)		1 (0QR,0CR)		
Haemophilus influenzae				1	
Gram positive cocci					
Vancomycin susceptible *Enterococcus*	4 (4QR,4CR)		1 (1QR,1CR)		
Vancomycin resistant *Enterococcus*	8 (8QR,8CR)	2 (2QR,2CR)	2 (2QR,2CR)		
Streptococcus -S. viridans (1), S. mitis (1), ß-hemolytic Strep (1), Group B Strep (1)			3 (3QR,0CR)		1
Methicillin sensitive *Staphylococcus aureus*		1 (1QR,0CR)	2 (1QR,0CR)	1	1
Methicillin resistant *Staphylococcus aureus*	1 (1QR,1CR)	2 (2QR,2CR)		1	1

-QR=quinolone resistance ; CR=third-generation cephalosporin resistant
-*infection with 2 organisms (occurred with 2 UTI's (one was mixed GNeg and GPos); only 1 organism counted on table)
-Other cases consisted of 2 septic arthritis, 1 cellulitis and 1 liver abscess

Table 3. Specific antibiotic to which patients with culture-positive infections were exposed to in the 30 days prior to the development of infection (n=70 culture-positive episodes in first infection only)

Antibiotic	**Number of patients**
No antibiotic	23
Oral non-absorbed antibiotics	16 (all on rifaximin)
Systemic antibiotics	31
Oral, fully or partially absorbed antibiotics used for SBP prophylaxis (ciprofloxacin, norfloxacin or bactrim)	9
Other systemic antibiotics • Piperacillin-tazobactam • 3rd generation cephalosporin • Ampicillin/Amoxicillin based • Linezolid or ticarcillin • Levofloxacin • Doxycycline • Vancomycin	22 • 8 • 7 • 2 • 2 • 1 • 1 • 1

Table 4. Predictors of antibiotic-resistant bacterial infections in 70 culture-positive infections (Of the 115 first infection only patients)

UNIVARIATE ANALYSIS for predictors of antibiotic- resistant infection		
Characteristic	**Odds ratio (95% CI)**	**p value**
Demographic variables		
Age	1.02 (0.97– 1.07)	0.48
Medications and Co-morbidities		
On beta-blockers	1.4 (0.5 – 3.6)	0.49
On proton pump inhibitors	2.3 (0.8 – 6.2)	0.11
Diabetes mellitus	1.2 (0.5 – 3.2)	0.71
Mode of infection acquisition and antibiotic exposure history		
Nosocomial infection	10.3 (3.3 – 32.1)	0.001
Antibiotics within 30 days of bacterial infection (any antibiotic versus no antibiotic)	7.7 (2.2 – 26.1)	0.001
Antibiotics within 30 days of bacterial infection • No antibiotic • Oral non-absorbed antibiotics • Systemic antibiotics*	 1.0 0.7 (0.1 – 4.2) 32 (7 – 144)	 Reference category 0.7 0.001
Labs and severity of liver disease		
Albumin (g/dL)	2.2 (1.0 – 4.6)	0.04
White blood cell count	1.03 (0.96 – 1.11)	0.44
Child Pugh score	1.8 (1.2 – 2.6)	0.002
MELD score	1.08 (1.03 – 1.14)	0.004
MULTIVARIATE ANALYSIS for predictors of antibiotic-resistant infection		
Characteristic	**Odds ratio (95% CI)**	**p value**
Antibiotic use within 30 days of bacterial infection • No antibiotic • Oral non-absorbed antibiotic • Systemic antibiotic*	 • 1 • 0.4 (0.04 – 2.8) • 13.5 (2.6– 71.6)	 • Reference • 0.32 • 0.002
Nosocomial infection	1.6 (0.2 – 9.9)	0.6
MELD	1.05 (0.96 – 1.15)	0.3
Albumin (g/dL)	1.5 (0.6 – 4.1)	0.4

**Some patients also received oral non-absorbed antibiotics

Table 5. Organisms isolated in culture-positive infections (multiple infections per patient), n=111

	UTI	SBP/SBE	Spontaneous bacteremia	Pneumonia	Other
	n=52	n=18	n=23	n=7	n=11
Gram negative bacilli					
B-lactam susceptible *Escherichia coli*	14 (7QR,0CR)	3 (1QR,0CR)	2 (2QR,0CR)		
ESBL producing *Escherichia coli*	2* (2QR,2CR)	1 (1QR,1CR)			
B-lactam susceptible *Klebsiella pneumoniae*	9 (2QR,0CR)	2 (0QR,0CR)	2 (0QR,0CR)	2	
ESBL producing *Klebsiella pneumoniae*	2* (1QR,2CR)	1 (1QR,1CR)		1	1
B-lactam susceptible *Pseudomonas species* -*P. aeurginosa (2), P. fluorescens (1)*	2 (0QR,0CR)		1 (0QR,0CR)		
ESBL producing *Pseudomonas aeurginosa*	1 (1QR,1CR)				
B-lactam susceptible *Citrobacter freundii*	1 (0QR,0CR)	2 (0QR,0CR)			
B-lactam susceptible *Enterobacter* *E. aerogenes (1), E. cloacae (2)*	2 (0QR,0CR)	1 (0QR,0CR)			
Amp-C-producing *Enterobacter cloacae*	1 (0QR,1CR)		1 (1QR,1CR)		
Acinetobacter			1 (0QR,0CR)		
Serratia marcescens					1
Proteus mirabilis	3 (2QR,0CR)		1 (0QR,0CR)		
Haemophilus influenzae				1	
Gram positive cocci					
Vancomycin susceptible *Enterococcus*	5* (5QR,5CR)		1 (1QR,1CR)		
Vancomycin resistant *Enterococcus*	9 (9QR,9CR)	3 (3QR,3CR)	4 (4QR,4CR)		
Streptococcus -*S. viridans (6), S. mitis (2), S. sanguis (1), ß-hemolytic Strep (1), Group B Strep (1)*		1 (1QR,0CR)	8 (8QR,0CR)		2*
Methicillin sensitive *Staphylococcus aureus*		2 (2QR,0CR)	2 (1QR,0CR)	1	2
Methicillin resistant *Staphylococcus aureus*	1 (1QR,1CR)	2 (2QR,2CR)		2	3
Coagulase negative *Staphylococcus*					2

-QR=quinolone resistance ; CR=third-generation cephalosporin resistant

-*infection with 2 organisms (occurred with 3 UTI's (2 were mixed GNeg and GPos) and 1 cellulitis; only 1 organism counted on table)
-Other cases consisted of 3 cellulitis, 3 septic arthritis, 2 endocarditis, 2 line infections and 1 liver abscess

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