2015-2017 Adult Antimicrobial Resistance (AR) Report Online Supplement

Mucosal Barrier Injury Laboratory-Confirmed Bloodstream Infection (MBI-LCBI) CLABSIs in Adult Locations

Notes on Methodology

This report is a supplement to the 2015-2017 NHSN Adult AR Report and contains CLABSI pathogen distributions and susceptibility data stratified by MBI-LCBI status. Additional methods can be found in the full report, located here: https://doi.org/10.1017/ice.2019.296.

Patients with an MBI-LCBI have at least one of the following conditions:

1. Is an allogeneic hematopoietic stem cell transplant recipient within the past year with one of the following documented during same hospitalization as positive blood specimen:
    a. Grade III or IV gastrointestinal graft versus host disease [GI GVHD]
    b. ≥1-liter diarrhea in a 24-hour period (or ≥20 mL/kg in a 24-hour period for patients <18 years of age) with onset on or within the 7 calendar days before the date the positive blood specimen was collected.
2. Is neutropenic, defined as at least two separate days with ANC† and/or WBC values <500 cells/mm3 collected within a 7-day time period which includes the collection date of the positive blood specimen, the 3 calendar days before and the 3 calendar days after.

The full definition of an MBI-LCBI can be found in the NHSN CLABSI protocol:
https://www.cdc.gov/nhsn/pdfs/pscmanual/4psc_clabscurrent.pdf

Abbreviations

VRE: vancomycin-resistant *Enterococcus* spp.
ESCs: extended-spectrum cephalosporins (cefepime, cefotaxime, ceftazidime, or ceftriaxone)
CRE: carbapenem-resistant Enterobacteriaceae (imipenem, meropenem, doripenem, or ertapenem)
MDR-1: multidrug-resistant (NS to one drug in at least 3 of the following classes: ESCs, FQs, AMINOs, carbapenems (R only), PIPTAZ)
MDR-2: multidrug-resistant (NS to one drug in at least 3 of the following classes: cefepime, FQs, AMINOs, carbapenems (R only), PIPTAZ)
FQs: fluoroquinolones (ciprofloxacin, levofloxacin, or moxifloxacin)
Select *Klebsiella* spp.: *Klebsiella oxytoca* and *Klebsiella pneumoniae*

Data Tables

S1. Frequency of MBI-LCBI Pathogens Reported to NHSN, by Adult Location Type, 2015-2017

Adult Location Type	Total No. CLABSI Pathogens	No. (%) MBI-LCBI Pathogens
Hospital Wards[1]	34,788	1,560 (4.5%)
Hospital ICUs	27,396	736 (2.7%)
Hospital Oncology Units	16,191	8,123 (50.2%)
LTACHs	10,828	27 (0.2%)
All Adult Locations	89,203	10,446 (11.7%)

S2. Pathogen Distribution Across MBI-LCBIs and non-MBI-LCBI CLABSIs in Hospital Wards, 2015-2017

	Non-MBI-LCBI		MBI-LCBI	
Pathogen	**#**	**%**	**#**	**%**
Staphylococcus aureus[2]	5,386	16.2%	0	0.0%
Coagulase-negative staphylococci[2]	3,792	11.4%	0	0.0%
Klebsiella (pneumoniae/oxytoca)	3,096	9.3%	248	15.9%
Enterococcus faecalis	2,558	7.7%	78	5.0%
Candida albicans	2,411	7.3%	58	3.7%
Escherichia coli	1,859	5.6%	420	26.9%
Other *Candida* spp.[3]	1,783	5.4%	93	6.0%
Enterococcus faecium	1,467	4.4%	206	13.2%
Candida glabrata	1,434	4.3%	26	1.7%
Pseudomonas aeruginosa[2]	1,407	4.2%	0	0.0%
Enterobacter spp.	1,364	4.1%	89	5.7%
Acinetobacter spp.[2]	660	2.0%	0	0.0%
Serratia spp.	655	2.0%	23	1.5%
Other *Enterococcus* spp.[3]	520	1.6%	57	3.7%
Stenotrophomonas maltophilia[2]	423	1.3%	0	0.0%
Other Pathogens	4,413	13.3%	262	16.8%
Total	33,228	100.0%	1,560	100.0%

S3. Pathogen Distribution Across MBI-LCBIs and non-MBI-LCBI CLABSIs in Hospital ICUs, 2015-2017

	Non-MBI-LCBI		MBI-LCBI	
Pathogen	**#**	**%**	**#**	**%**
Coagulase-negative staphylococci[2]	3,789	14.2%	0	0.0%
Candida albicans	2,764	10.4%	80	10.9%
Staphylococcus aureus[2]	2,497	9.4%	0	0.0%
Other *Candida* spp.[3]	2,102	7.9%	84	11.4%
Enterococcus faecalis	2,069	7.8%	48	6.5%
Candida glabrata	1,778	6.7%	58	7.9%
Enterococcus faecium	1,764	6.6%	217	29.5%
Klebsiella (pneumoniae/oxytoca)	1,648	6.2%	60	8.2%
Pseudomonas aeruginosa[2]	1,061	4.0%	0	0.0%
Escherichia coli	1,059	4.0%	70	9.5%
Enterobacter spp.	1,058	4.0%	20	2.7%
Serratia spp.	583	2.2%	5	0.7%
Other *Enterococcus* spp.[3]	508	1.9%	37	5.0%
Acinetobacter[2]	392	1.5%	0	0.0%
Yeast not specified[2,4]	365	1.4%	0	0.0%
Other Pathogens	3,223	12.1%	57	7.7%
Total	26,660	100.0%	736	100.0%

S4. Pathogen Distribution Across MBI-LCBIs and non-MBI-LCBI CLABSIs in Hospital Oncology Units, 2015-2017

	Non-MBI-LCBI		MBI-LCBI	
Pathogen	**#**	**%**	**#**	**%**
Coagulase-negative staphylococci[2]	1,681	20.8%	0	0.0%
Staphylococcus aureus[2]	1,163	14.4%	0	0.0%
Pseudomonas aeruginosa[2]	701	8.7%	0	0.0%
Escherichia coli	537	6.7%	2,130	26.2%
Klebsiella (pneumoniae/oxytoca)	484	6.0%	957	11.8%
Enterococcus faecium	373	4.6%	1,297	16.0%
Enterococcus faecalis	276	3.4%	388	4.8%
Viridans group streptococci	259	3.2%	1,127	13.9%
Other *Candida* spp.[3]	176	2.2%	383	4.7%
Stenotrophomonas maltophilia[2]	166	2.1%	0	0.0%
Enterobacter spp.	157	1.9%	375	4.6%
Candida albicans	147	1.8%	69	0.8%
Rothia mucilaginosa	143	1.8%	95	1.2%
Candida glabrata	135	1.7%	114	1.4%
Other *Enterococcus* spp.[3]	81	1.0%	258	3.2%
Other Pathogens	1,589	19.7%	930	11.4%
Total	8,068	100.0%	8,123	100.0%

S5. Percent of Pathogens Reported from Adult MBI-LCBI and non-MBI-LCBI CLABSIs in Hospital Oncology Units that Tested Non-Susceptible (NS) to Select Antimicrobial Agents, 2015-2017

	non-MBI-LCBIs			MBI-LCBIs		
Pathogen, Antimicrobial[2]	# Reported	% Tested	% NS[5]	# Reported	% Tested	% NS[5]
Enterococcus faecium	373			1,297		
Vancomycin (VRE)		94.1	79.8		94.6	82.1
Enterococcus faecalis	276			388		
Vancomycin (VRE)		91.3	6.7		88.9	7.8
Select *Klebsiella* spp.	484			957		
ESCs		84.1	12.8		86.2	23.2*
Carbapenems (CRE)		71.5	3.5		74.7	5.6
MDR-1		90.3	6.9		92.6	15.2*
Escherichia coli	537			2,130		
ESCs		82.1	23.1		85.4	29.5*
Carbapenems (CRE)		73.6	1.3		77.3	1.5
FQs		90.5	43.8		90.2	70.7*
MDR-1		89.2	13.6		90.4	18.5*
***Enterobacter* spp.**	157			375		
Cefepime		76.4	10.0		78.1	11.3
Carbapenems (CRE)		77.7	6.6		78.1	7.5
MDR-2		87.9	6.5		90.9	7.3

**Statistically significantly different than %NS in the non-MBI-LCBI group*

Footnotes:

1. Consists of adult non-critical care locations within acute care hospitals including step-down units, mixed acuity units, and specialty care areas.
2. The following pathogens included in the above tables are not eligible to meet NHSN's definition of an MBI-LCBI CLABSI: Coagulase-negative staphylococci, *Staphylococcus aureus, Pseudomonas aeruginosa, Acinetobacter* spp., *Stenotrophomonas maltophilia,* Yeast. Therefore, %NS is not displayed for MRSA, *P. aeruginosa* phenotypes, and *Acinetobacter* spp. phenotypes.
3. The group 'Other *Enterococcus* spp.' combines enterococci identified to the species level, excluding *E. faecium* and *E. faecalis*, and enterococci for which the species was not reported. The group 'Other *Candida* spp.' combines *Candida* identified to the species level, excluding *C. albicans* and *C. glabrata*, and *Candida* for which the species was not reported.
4. Includes any yeast pathogen not otherwise specified.
5. VRE and CRE data are presented as %R (i.e., includes only those pathogens that tested resistant). All other phenotypes are shown as %NS (i.e., includes pathogens that tested intermediate or resistant).