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Perspectives on central-line–associated bloodstream infection surveillance in home infusion therapy

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Current criteria for home healthcare–associated central-line–associated bloodstream infections (CLABSIs) lack specificity and have not been widely adopted by home infusion agencies.[1–4] We surveyed stakeholders in 3 different professional associations around CLABSI surveillance practices in home infusion therapy.

Methods

We surveyed US-based members of 3 professional societies about CLABSI definitions, denominator data, and inclusion and exclusion criteria. The Infusion Nurses Society (INS) is a 6,000-member global organization of primarily nurses who work in all practice settings where infusion therapy is delivered, including home infusion therapy.[5] The National Home Infusion Association (NHIA) is a 400-member trade organization focused on providing infusion products and services in the home.[6] The Society for Healthcare Epidemiology of America Research Network (SRN) is a network of 111 unique healthcare institutions that

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collaborate on research to prevent healthcare-associated infections and antibiotic resistance.[7] Eligible respondents were those whose primary practice setting was the home, who worked for a home infusion or home health nursing agency, or whose hospital had a relationship with home infusion or home nursing agencies.

Separate surveys were developed for the 3 professional societies because each stakeholder group conceptualized terms differently (Appendices 1–3 online).[8] Each survey was pilot-tested with 2–12 society or network leaders who edited for clarity.

The surveys were released between June and November 2018 via e-mail lists (INS and SRN surveys) and a trade magazine and organizational website (NHIA survey). Respondents were also asked to forward the survey to a colleague with knowledge of CLABSI in home infusion therapy. Respondents were reminded weekly if they had not yet responded to the survey, with a total of 3 notifications for INS and SRN surveys. The NHIA survey was open for 4 weeks to allow for the trade magazine to be published.

Where appropriate, χ^2 analyses were used to determine the significance of the differences in responses between groups. Stata version 14 software (StataCorp, College Station, TX) was used for all analyses.

The Institutional Review Board of the Johns Hopkins University School of Medicine deemed this study exempt from review.

Results

The largest percentage of respondents from each society used the definition of CVC days at home as their denominator (25.9%–48.4%) (Table 1). INS and NHIA members were more likely than SRN members to state that provider documentation would be used as the sole or main criteria for defining a CLABSI (41.4%, 42.3%, and 14.8%, respectively; $P = .042$). INS and NHIA members were more likely than SRN members to use a positive CVC tip culture to define a CLABSI (43.7%, 42.3%, and 7.4%; respectively, $P = .0023$). Some respondents from all 3 professional groups believed their agencies would use acute-care National Healthcare Safety Network (NHSN) criteria to define a CLABSI (30.8%–39.1%). INS members were more likely to use Association for Professionals in Infection Control/ Healthcare Infection Control Practices Advisory Committee (APIC-HICPAC) CLABSI criteria (INS, 18.4%; SRN, 3.7%; NHIA, 0.0%; $P = .043$). Further workplace characteristics and experiences with CLABSI surveillance in home infusion therapy are available (Appendices 4–6 online).

Discussion

Our survey analysis shows that professionals in healthcare epidemiology, home infusion therapy, and infusion nursing have different approaches to CLABSI surveillance in home infusion therapy. Although definitions for CLABSI in home infusion therapy have existed since 2008, [1] these definitions have not been widely accepted among home infusion professionals. In addition, acute-care NHSN CLABSI criteria[2] may not apply to home

infusion therapy. The NHIA suggests that agencies report “access device complications,” including CLABSI, but they do not specify further.[9]

We observed differences in what members of the 3 groups would consider a CLABSI. INS and NHIA members were more likely than SRN members to use a CVC tip culture or provider documentation as part of their criteria for CLABSI in home infusion therapy—neither of which is a component of acute-care NHSN or APIC-HICPAC criteria.[1,2] Few used APIC/HICPAC or acute-care NHSN criteria.[1,2] A prior study of pediatric home infusion agencies similarly showed that none used all APIC-HICPAC criteria in tracking CLABSIs.[4]

We also detected differences in CLABSI attribution and inclusion and exclusion criteria, particularly around whether to include data on a patient whose home infusion and home nursing agencies were unaffiliated with each other, or on patients who also receive care from outpatient infusion centers, outpatient oncology clinics, or hemodialysis centers. Participants also varied on CLABSI inclusion and exclusion criteria, including disagreement over what catheters should be included for CLABSI surveillance.

Ours is one of the first studies to obtain perspectives from home infusion agencies, home infusion nurses, and healthcare epidemiologists. We were able to gain perspectives from a wide variety of professionals, including those who work in nonprofit, for-profit, and academic settings.

However, our study had several limitations. We were unable to calculate response rates because we did not know which professional society members were eligible (ie, who worked in home infusion therapy). Low numbers of responses suggest the possibility of response bias. The surveys also differed among the professional societies because there were differences in item interpretation. We asked participants to forward the surveys to those with expertise in home infusion therapy CLABSI surveillance, but we are unsure how frequently that occurred.

Our data show that despite published definitions,[1,2,9,10] there are differences in how home infusion agencies, home infusion nurses, and healthcare epidemiologists perform CLABSI surveillance in home infusion therapy. We suggest that clarification of home infusion therapy CLABSI definitions occur through a transdisciplinary approach including experts in healthcare epidemiology, infection prevention, infusion nursing, home infusion therapy, home health nursing, parenteral nutrition, and quality metric development.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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Table 1.

Variations in Components of Definitions for Central Line-Associated Bloodstream Infection in Home Infusion Therapy

Characteristic	Infusion Nurses (N=87), No. (%)	Healthcare Epidemiologists (N=27), No. (%)[a]	Home Infusion Agencies (N=26), No, (%)	*P* Value for Difference
Denominator data				
Per overall no. of patients	7/62 (11.3)	4 (14.8)	0 (0.0)	.40
Per line days at home	30/62 (48.4)	7 (25.9)	11 (42.3)	.14
Per month	N/A	5 (18.5)	1 (3.8)	.092
Per quarter	N/A	2 (7.4)	7 (26.9)	.059
Therapy days at home	0/62 (0.0)	1 (3.7)	6 (23.1)	.001
Unknown	5/62 (8.1)	3 (11.1)	0 (0.0)	.61
Overall number of infections only	15/62 (24.2)	N/A	N/A	N/A
Line day definition				
Days at home with CVC	N/A	N/A	7 (26.9)	N/A
Days from third day at home with CVC to removal	N/A	N/A	1 (3.8)	N/A
Exclude days if patient is readmitted	N/A	N/A	3 (11.5)	N/A
Days from CVC insertion to removal	N/A	N/A	1 (3.8)	N/A
CLABSI definition: provider note in chart	36 (41.4)	4 (14.8)	11 (42.3)	.042
Positive culture of CVC tip	38 (43.7)	2 (7.4)	11 (42.3)	.002
NHSN criteria	35 (39.1)	9 (33.3)	8 (30.8)	.61
Positive blood culture	23 (26.4)	2 (7.4)	8 (30.8)	.080
APIC/HICPAC criteria	16 (18.4)	1 (3.7)	0 (0.0)	.043
INS standards	2 (2.3)	N/A	0 (0.0)	.67
Inclusion criteria				
Would include data from patient whose home infusion and home nursing agencies are not affiliated	47 (54.0)	7 (25.9)	13 (50.0)	.037
Would include data from patient whose CVC also accessed in outpatient infusion center	38 (43.7)	4 (14.8)	10 (38.5)	.025
On hemodialysis	24 (27.6)	3 (11.1)	5 (19.2)	.33
CVC also accessed in oncology clinics	35 (40.2)	N/A	9 (34.6)	.61
Someone also receiving home parenteral nutrition	55 (63.2)	N/A	19 (73.1)	.35
Someone receiving only product	N/A	N/A	14 (53.8)	N/A

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Characteristic	Infusion Nurses (N=87), No. (%)	Healthcare Epidemiologists (N=27), No. (%)[a]	Home Infusion Agencies (N=26), No, (%)	*P* Value for Difference
Midline catheter	N/A	3 (11.1)	N/A	N/A

Note. CLABSI, central line-associated bloodstream infection; CVC, central venous catheter; NHSN, National Healthcare Safety Network; APIC, Association of Professionals in Infection Control and Epidemiology; HICPAC, Healthcare Infection Control Practices Advisory Council; INS, Infusion Nurses Society; N/A, not applicable.

[a]Healthcare epidemiologists were asked specifically about their main hospital's internal home infusion agency.

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