

Abstract #1092

ABSTRACT

Background: The prevalence of antibioqram use, compilation methods, and attitudes toward antimicrobial resistance and stewardship in Michigan (MI) hospitals is unknown. Our objectives were to evaluate antibioqram prevalence and use, hospital personnel antibioqram knowledge, and to describe attitudes and opinions of health care providers toward antimicrobial resistance surveillance and stewardship in MI hospitals.

Methods: A cross-sectional survey research study was conducted using a convenience sample of 425 personnel employed at 134 inpatient acute care hospitals in MI. The study participants, including physicians, pharmacists, microbiologists and administrators, completed the survey anonymously, available online from February 7-21, 2013.

Results: Of the 425 surveys electronically distributed to 404 personnel at 134 hospitals, responses from 131 respondents (32%) employed at 74 (55%) MI hospitals were included. Most (97%) respondents reported an antibioqram at their institution; however, only 7% of northern MI respondents included unit-specific data. Most (78%) respondents had an antimicrobial stewardship program (ASP). The majority (85%) had an infectious diseases (ID) specialist; of the 15% without, all were from hospitals < 250 beds. Over one-third (39%) of hospitals in northern MI did not have an ID specialist. The majority (79%) of respondents strongly agreed that antibiotic resistance is a problem in MI and that antimicrobial stewardship can improve clinical outcomes (82%), minimize toxicity (76%), limit emergence of resistance (82%) and reduce expenses attributable to antimicrobial use (79%). We found socio-demographic differences in attitudes and practices of the personnel.

Conclusion: This is the first state-wide survey to our knowledge to assess antibioqram use and patterns among hospitals. Among respondents from 74 MI hospitals, the prevalence of antibioqram use was high. The majority of institutions had an ASP and ID specialty clinician. Attitudes toward antimicrobial stewardship were overwhelmingly positive. However, gaps in antibioqram use and knowledge were identified in some remote regions. Outreach programs within the state of MI are needed to improve antibioqram use and knowledge pertaining to antimicrobial resistance in geographically remote regions.

INTRODUCTION

- Antibioqrams (abgm) are important in characterizing resistance and susceptibility patterns within hospitals and may be a cost-effective and accurate means to evaluate regional resistance trends or conduct national surveillance.
- Antibioqrams are most frequently used to develop guidelines for empirical antimicrobial therapy decisions and management of infections prior to the availability of microbiological infection results (1,2).
- A standardized tool is needed to effectively measure antimicrobial susceptibility and analyze resistance patterns
- Little is known about how Michigan (MI) hospitals are compiling antibioqrams as well as health care personnel attitudes toward stewardship and antibiotic resistance
- The purpose of this study was to:
 - Investigate the prevalence of antibioqram use in MI hospitals
 - Assess the knowledge level of key hospital personnel and health care providers regarding current antibioqram practices and policies
 - Gain an understanding of opinions and attitudes of health care workers toward antimicrobial resistance surveillance and stewardship in hospitals

METHODS

RESEARCH DESIGN

- Cross-sectional research study using a non-probability sample of local health care workers
- Participants anonymously completed a short web-based survey
- The Institutional Review Boards of Henry Ford Hospital and Wayne State University approved this study

INSTRUMENTS

- Online survey (SurveyMonkey®, Palo Alto, CA) consisting of 18 multiple-choice questions
- Demographic data was gathered using 13 additional questions
- Content validity of the survey was established via feedback from 10 experts including Infectious Diseases (ID) physicians, pharmacists and survey methodologists

SAMPLE RECRUITMENT

- A hospital list was obtained from the Michigan Department of Community health with institution phone numbers and location (city and state)
- Email addresses of participants of interest were obtained via cold calling the institution, participant referral, sign-up sheets at professional society meetings or society listserv data
- Surveys were distributed to 425 personnel at 134 Michigan hospitals
- Respondents were given 2 weeks to complete the survey online; reminder emails were sent to non-responders at 1 week

STUDY PARTICIPANTS

- MI acute care hospital personnel including pharmacists, physicians, microbiologists and hospital administrators were eligible for study inclusion
- Mental health care facilities, long term care and rehabilitation facilities were excluded since our primary focus was inpatient antibioqrams

STATISTICAL ANALYSIS

- Descriptive statistics were compiled and responses compared using Chi-squared or Fisher's Exact tests
- Statistical analyses were performed using SPSS statistical software (release 21.0, SPSS, Inc., Chicago, IL)
- Answers were stratified by demographic information including work role, specialty, institutional characteristics and geographical location in MI

Table 1. Survey and General Acute Care Hospital Respondent Characteristics, Michigan, 2013

Characteristic	No. (%) of Respondents ^a
No. of respondents	131 (32)
Gender (n = 125)	
Male	64 (51)
Female	61 (49)
Highest degree received (n = 129)	
PharmD/RPh	47 (36)
MD/DO	41 (32)
Other	41 (32)
Occupation of respondents (n = 124)	
Clinical	78 (62)
Administrative	21 (17)
Microbiology	25 (20)
Length of practice in current specialty (n = 126)	
<21 years	71 (56)
21 years or more	55 (44)
Practice site ^b (n = 125)	
Teaching hospital	72 (57)
Community	46 (36)
Not for profit	30 (23)
Private	9 (7)
Government	8 (6)
Infectious Diseases specialty clinician at institution ^b (n = 124)	
Yes, ID physician	102 (82)
Yes, ID pharmacist	54 (44)
No specialist	20 (16)
Antibioqram present (n = 128)	
Yes	124 (97)
No	4 (3)
ASP present (n = 128)	
Yes	100 (78)
No	28 (22)
Hospital number of beds (n = 126)	
Less than 250	55 (44)
≥ 250	71 (56)
Hospital geographical region in Michigan (n = 123)	
Southeastern	73 (59)
Other	50 (41)

^a Percentages reflect valid responses; some respondents skipped questions and were not counted
^b Not mutually exclusive

RESULTS

Table 2. General Acute Care Hospital Respondent Antibioqram Data, Selected variables Sorted by Hospital Characteristic, Michigan, 2013

Abgm Characteristics	Hospital Characteristic										
	Teaching		Community		Bed size ≥250		Geography (SE vs. other)		ID specialist		
	P-value ^a	OR	P-value	OR	P-value	OR	P-value	OR	P-value	OR	
Abgm compiled by institution microbiologist	0.020*	2.35	0.163	NA	0.108	NA	0.698	NA	0.320	NA	
ASP present at institution	<0.001*	5.56	0.18	NA	<0.001*	6.69	<0.001*	5.78	<0.001*	5.69	
Unit-specific isolates in abgm	<0.001*	6.3	0.29	NA	<0.001*	5.1	0.007*	3.18	0.001*	--	
Abgm Distribution	Hospital website	0.001*	3.6	0.004*	0.34	0.018*	2.5	0.175	NA	0.052	NA
	Print copy	0.003*	0.32	0.006*	7.5	0.470	NA	0.002*	0.29	0.246	NA

[#]P-value < 0.05 considered significant
^aOR: odds ratio; NA: not applicable if P-value non-significant
^{*}Significant compared to other hospital characteristics

- Ninety-seven percent of respondents reported presence of an antibioqram
- Attitudes and opinions:
 - Majority of respondents agreed: 1) antibiotic resistance is a problem in the state of MI; 2) antibiotic resistance can be influenced by changing current antibiotic prescribing patterns; 3) antimicrobial stewardship is useful to improve clinical outcomes
 - Administrative personnel were significantly less likely to select "aids in formulary development" as the purpose of an antibioqram
 - Administrators were significantly more likely to "strongly agree" antimicrobial stewardship is useful to minimize toxicity
- Seventy-eight percent of respondents reported an antimicrobial stewardship program (ASP) at their institution; 98% of respondents in institutions with an ID pharmacist had an ASP compared with only 62% of institutions without an ID pharmacist
- Hospital practice site (teaching or community), bed size, geographical location (SE MI vs. other), and presence of an ID specialist had no significant impact on whether a pharmacist or other personnel compiled hospital antibioqram

CONCLUSIONS

- Most respondents from MI acute care hospitals reported having an antibioqram at their institution; about three-quarters reported presence of a stewardship program at their site
- Antibioqram characteristics were significantly influenced by hospital characteristics as follows:
 - Teaching hospitals were more likely to have the antibioqram compiled by microbiologist
 - Teaching hospitals, bed size ≥ 250, location in SE MI and institutions with an ID specialist were more likely to have an ASP present at their institution and to include unit-specific isolates in antibioqram
 - Antibioqrams were more likely to be distributed by hospital website in teaching hospitals and hospitals with the bed size ≥ 250 beds; community hospitals were less likely to utilize electronic distribution
 - Printed copy distribution of antibioqrams was less likely in teaching hospitals and SE MI hospitals, more likely in community hospitals
- This is the first state-wide survey to assess antibioqram use at acute care hospitals. Further efforts to include more standardized data are needed to track state and national resistance patterns.

REFERENCES

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