Are Emergency Providers' Knowledge and Perceptions of HIV and Hepatitis C Guidelines Influencing Their Practice? A Pilot Study in Appalachia

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Abstract

Background: There is increasing concern of unidentified infectious diseases, including human immunodeficiency virus (HIV) and hepatitis C virus (HCV), due to the recent opioid epidemic. The purpose of this study was to assess emergency physicians', advanced practice providers' (APPs), and registered nurses' (RNs) knowledge and perceptions of the current Center for Disease Control and Prevention (CDC) HIV and HCV screening guidelines and how it may affect their routine practice habits.

Methods: A 25-item electronic survey was distributed to emergency physicians, APPs, and RNs from two emergency departments in West Virginia. Data were analyzed descriptively across all variables.

Results: In October 2018, 47 providers completed the survey. Of those, 29 (62%) selected the correct HCV screening protocols, and 67% (31) reported they currently suggest HCV screenings to their patients. Although only six (13%) providers selected the correct HIV protocols, a larger proportion of 73% (34) suggest HIV screenings during their patient encounters. Reasons listed for not conducting these screenings while on shift included *"not an emergency"* and *"not my role as an EM doc."* However, reasons that would make providers more likely to screen included *"free screening for patients"* and *"results available faster."*

Conclusions: This pilot study was the first to assess knowledge and perceptions of HCV and HIV screenings among a variety of Appalachian emergency providers. Our results suggest that all categories of providers surveyed lack appropriate knowledge of the current CDC screening guidelines and have varying attitudes toward screening behaviors, which could affect consistent practice to identify new infection.

Background

Infection rates of hepatitis C virus (HCV) and human immunodeficiency virus (HIV) have steadily increased in the United States and specifically, the Central Appalachian region. It is estimated that 3.5 million people are infected with HCV, and 1.2 million are infected with HIV, of which many are undiagnosed (1,2). Of those, 472,200 cases were reported in the Appalachian region in 2012 (2). Co-infection rates of HCV and HIV have also been on the rise, which may be associated with the increasing intravenous drug use (IVDU) in this region (3). In a recent report, approximately 25% of all HIV-positive individuals have a co-infection with HCV, and co-infection rates as high as 90% have been seen in HIV-positive IVDU (4,5). Although there is limited data on co-infection in Appalachia, following the HIV outbreak in rural Indiana in 2015, the Center for Disease Control and Prevention (CDC) conducted a vulnerability analysis, which identified nationwide counties at high risk for HIV and HCV infections; 56% of those identified were located in three Appalachian states: Kentucky, West Virginia and Tennessee (6). With increasing rates of acute infections during the opioid epidemic, there is a need to implement routine HIV and HCV screenings during patient visits, as well as to develop a strong knowledge base regarding current guidelines for screening and assessing patient risk.

Both regionally and nationally, many emergency departments (EDs) and other acute care locations have incorporated HIV and/or HCV screenings into their routine clinical care (7, 8). For example, one ED initiated an opt-out HCV screening model for all baby boomers and high-risk patients, while another ED implemented an opt-out screening method to test for HIV, as well as hepatitis B virus (HBV) and HCV (7,9). The electronic medical record (EMR), along with current CDC guidelines, has been utilized to help providers readily identify the patients who meet the criteria for these screenings (8). One study used the EMR to record results from opt-out testing, while the EMR has also been used to identify patients at higher risk of contracting HIV and/or HCV and those who meet screening guidelines through best practice alerts (BPAs) (7,9). When ED staff receive alerts for patients who meet the criteria, a strong knowledge of the current CDC screening guidelines would be beneficial, as timely identification of these patients could help reduce the rate of new HIV and HCV infections.

Currently, there is limited research on healthcare providers' knowledge of HCV and HIV screening recommendations and no prior literature on provider perceptions related to these screenings that may influence their practice. Therefore, the purpose of this study was to evaluate Appalachian ED provider and nursing knowledge of current HCV and HIV CDC screening guidelines and their perceptions of these screenings and evaluate if they seemingly affected their screening rates.

Methods

Study Design & Setting

This study was conducted at two, Central Appalachian EDs: an academic, level I trauma, tertiary referral center; and an academic-affiliated, community, level II trauma center. Both locations complete approximately 52,000 patient visits per year. At the time of the survey dissemination, the level I trauma ED had been engaged in a HIV and HCV screening program since June 2017, whereas the second location had not yet begun routine screenings. The program utilized an EMR (Epic® 2015, Epic Systems Corporation) in order to effectively identify eligible patients for HCV and HIV screenings through a universal screening protocol: those 18 years of age and older who have not been screened at least once in the past year or who have noted risk factors that warrant further testing more than once per year. The electronic survey was distributed to ED providers at both locations through departmental listserves, including attending physicians, resident physicians, and advanced practice providers (APPs), as well as registered nurses (RNs) utilizing Qualtrics® software. This study was reviewed and approved by the affiliated university's institutional review board.

Survey

The 25-item Qualtrics® Software System survey was disseminated in October 2018 via email with a hyperlink and had three main sections: demographics, knowledge, and perceptions. Demographic questions included age, gender, level of training (i.e. MD/DO, APP, fellow, resident, RN), and primary

practice setting. Knowledge-based questions were developed based upon the CDC guidelines for HIV and HCV screenings and had one correct answer. Examples of these questions included: *Which of the following represents the current CDC guidelines for HIV testing?*, and *Which of the following represents the current CDC guidelines for HCV testing?* Perception-based questions were focused on assessing provider and nursing staff's attitudes towards HIV and HCV screenings in their respective locations, with multiple response options available and some questions allowing a "select all that apply" response. These types of questions included: *Do you recommend HIV testing to eligible patients during their visit?*, *Do you prescribe PreP therapy to high risk individuals?*, and *What would make you more likely to test for HCV in your practice setting?* In addition, two *Why or Why Not?* questions populated on the survey in order to assess reasons for or against screenings, with open-response options for participants. A complete copy of the survey can be found as Supplementary Material.

Data Analysis

Data were analyzed descriptively for all demographic variables collected in order to provide counts of response rates. Questions with "correct" responses were scored to evaluate the proportion of correct responses from participants. Perception-based questions were also analyzed descriptively. Comparative analyses were conducted between type of emergency providers and staff, including RNs, physicians, APPs, and resident physicians. Responses to open-ended questions were analyzed using conventional content analysis, wherein text responses were coded and then grouped into categories and eventually into emergent themes.

Results

In October 2018, 47 participants completed the survey, of which 63% were female, with an average age of 35, ranging from 22 to 63 years. Twenty (43%) RNs and 16 (34%) physicians completed the survey, as well as six (12%) APPs and five (11%) residents. Approximately 69% of providers reported currently practicing primarily at an academic center, while the remainder stated they practice in a community setting.

Screening Practices & Knowledge

Overall, a total of 29 (62%) ED providers and nurses selected the correct HCV CDC screening recommendations, while 31 (67%) of participants reported they currently suggest HCV screenings during their patient visits, showing relative consistency with knowledge and screening practice. In comparison, only six (13%) providers selected the correct HIV CDC screening recommendations, yet 34 (73%) reported that they suggest HIV screenings during their patient encounters, showing a higher number of patient screening in practice but perhaps outside the guidelines. RNs were more likely to report that they recommend HCV screenings (75%) than their attending physician (56%) and APP (67%) colleagues. In

regards to HIV, however, 100% of APP respondents reported they suggest screenings, while RNs (75%) and attending physicians (63%) were not as likely.

When analyzing knowledge-based question responses by provider type, all groups were relatively knowledgeable regarding risk factors or behaviors for HCV and HIV, but were less likely to provide correct responses regarding the current CDC screening guidelines. Table 1 displays a complete breakdown of responses by provider type. Attending physicians were more likely to respond correctly to the knowledge-based questions than their ED colleagues; however, all groups had similar rates of correct responses to questions regarding risk factors for both HCV and HIV.

Perceptions of Screenings

When asked *“why or why not”* they recommend screenings during their visits, approximately 49% of ED providers and RNs provided written comments. All open-ended responses for both HCV and HIV screenings can be found in Table 2. Commons reasons for not suggesting either screening option included *“not an emergency,” “time constraint,” “not my role as a [emergency room] doc[tor],”* and *“not part of workup for acute/active issue.”* One registered nurse responded that *“false positives are stressful”* while an APP stated they *“don’t feel this is appropriate for emergency medicine.”*

Table 2

Open-ended responses to *“why or why not”* ED providers or nursing staff suggest HCV and HIV screenings during patient encounters.

	Nurse	Attending	APP	Resident
HCV				
Yes	<ul style="list-style-type: none"> • Because we have a grant for free screening. • best practice • It's free • Protocol order sets 	<ul style="list-style-type: none"> • Decrease transmission and increase treatment options • If they are at risk • Medically indicated • part of an ongoing research project • Recommendations • When it is appropriate I do 	<ul style="list-style-type: none"> • it's good to know! • routine offer 	<ul style="list-style-type: none"> • Good to catch early • EMR forces you to
No	<ul style="list-style-type: none"> • it's an automatic ordered test on the individuals and I explain to the patient that it's free and offered by CDC at no cost to the patient and that they may refuse the test if they wish 	<ul style="list-style-type: none"> • Don't think about it • Not an emergency • Not going to change my management in the ER • Time constraint 	<ul style="list-style-type: none"> • I don't feel this is appropriate for emergency medicine. 	<ul style="list-style-type: none"> • Not part of workup for acute issue
HIV				
Yes	<ul style="list-style-type: none"> • Because we have a grant for free screenings! • best practice • It's free • Currently it is available and free of charge with no charge to insurance also. To my knowledge. • it's free 	<ul style="list-style-type: none"> • Sometimes for high-risk patients • If positive, can prevent transmission and early treatment • If they are at risk or it is pertinent to their ED presentation • It is medically indicated • may change treatment plan • CDC recommendations • When it is appropriate, I offer 	<ul style="list-style-type: none"> • why not? • routine offer 	<ul style="list-style-type: none"> • Good outcomes catching earlier and stopping disease spread • EMR forces you to do it.
No	<ul style="list-style-type: none"> • False positives are stressful • It's an automatic lab ordered for anyone over the age of 18. I tell the patient the CDC offers free HIV testing and that it's drawn and that they have the right to refuse the test if they wish but that it is free at no cost to them. 	<ul style="list-style-type: none"> • Not an emergency • Unless clinically indicated, not my role as ER doc • Time constraint • Often don't think about it 	-	<ul style="list-style-type: none"> • Not part of workup for active complaint

There were four most common factors that ED providers and nurses selected that would make them more likely to screen for HCV and HIV in their practice settings: free testing for patients (60%; 62%), immediate results available the during patient visit (47%; 60%), able to provide affordable follow-up care (40%; 51%), and more time available to spend with the patient during their visit (38%; 38%).

Discussion

This study was the first to evaluate Appalachian-based emergency providers and nurses' knowledge and perceptions of current HIV and HCV screening practices. Other studies have assessed the perceptions of providers on HIV screening; however, none have assessed perceptions and/or knowledge of ED providers or nurses in regards to HCV screening.

In our study, only six providers and RNs selected the correct HIV screening recommendations, while 73% were in favor of HIV screening during a visit. These results are similar to a study with our urban counterparts, where providers were in favor of general routine, targeted testing; 55% of emergency providers favored or strongly favored ED-based routine HIV testing at six months (10). However, even with data supporting HIV screening, only 38% of respondents said they were willing to offer the routine testing to their patients (7). This suggests that although providers may report that they are in support of HIV screening, they may not actually be following through and recommending testing to their patients. Furthermore, the knowledge based questions on the current CDC HIV screening recommendations show that increased education is needed in all ED staff, from nursing to attending physicians. Qualitative research in this area has also shown that physicians, in particular, are frequently surprised by the willingness of patients to be tested for HIV and HCV (11). A recent study found that patients are very willing to be tested, with rates as high as 91% (12). There is the possibility that if providers and RNs were aware of their patients' willingness to be screened, they would be more likely to pursue infectious disease-related testing. However, the concept of the opt-out model may be removing the opportunity for emergency providers and nurses to have a conversation regarding patient preferences.

When asked knowledge based questions regarding HCV, an overwhelming majority of respondents across all groups recognized the potential long-term complications of the virus. A high number were also aware that the baby boomer age group should be screened and were also aware of additional risk factors. This could be due to the recent increased marketing and education efforts in regards to HCV screening.

However, only attending physicians correctly identified the younger age group with the fastest growing incidence of new HCV infection, potentially indicating that most providers and nursing staff would not identify these patients as at risk. For 20-29 year olds who frequent the ED, further questioning to identify potential at risk behaviors could lead to increase screening and early identification of infection. Since there was a low correct response rate to questions concerning co-infection, HIV patients may also not be effectively screened for HCV.

The open-ended responses as to why or why not providers and nurses conduct screenings during their patient encounters were eye-opening, raising concerns as to why providers feel these screenings are not

appropriate for the emergency medicine setting and what exactly constitutes as an “emergency.” A similar study that assessed why or why not emergency physicians test for HIV found that the most frequently cited barriers were inadequate resources, time constraints, and follow-up care concerns (13). Our study had similar themes present of ensuring appropriate follow-up care would be received; however, providers and nurses also reported that having more time to spend with the patient is currently a perceived barrier to testing. These themes are still present over a decade later, even after the recent increase in implementations of screening programs in EDs. Thus, there is a need to communicate with providers and nurses regarding these protocols during design and subsequent implementation (13). It is apparent that there are still lasting barriers that need to be addressed in order to efficiently implement widespread infectious disease screenings in the ED, which may lead to an increase of routine screenings not only the ED, but other inpatient hospital units and clinical settings as well.

Perceived factors that would make providers more likely to screen patients during their ED encounter included free screenings for patients, results becoming available faster, and more time to spend with the patient. These responses suggest that time and resources play an important role in why providers may or may not conduct screenings, although their knowledge of these factors may not always be accurate. Screening for infectious diseases per up to date guidelines may be paid by the patient’s insurance coverage, while grants are also available for testing. Often, initial results for the antibody screening tests have a quick turn-around time of same day although confirmatory testing can take longer. Providers are required to acquire regular continuing medical education hours, so it is possible that these topics are not routinely addressed at emergency provider conferences, lectures, and in educational material. Since this knowledge has been identified as a deficit, these providers should look for more options for specialized education to remain up to date on current screening practices and the impact of these diseases in public health as it could affect their patients.

Limitations

There were a number of limitations to this present study. First, although initially successfully as a pilot study, the sample size was relatively small and predominately registered nurses and attending physicians. There is a need to disseminate the survey on a wider scale to gain more insight from all emergency roles, including APPs and resident physicians. A larger sample size would allow for a better representation of perceptions and knowledge across these roles. It would also be beneficial to increase the number of respondents from each level of training in order to see if more focused education is needed. For example, there may be the opportunity to include more infectious disease-related content into a residency curriculum matrix as a means to address these concerns. Second, for the multiple choice questions, it may have been possible that the correct responses were sometimes selected incidentally from the choices listed, especially with those that had “All of the above” as a response option.

Third, this was a single institution dissemination of the survey, and the increasing rates of HIV and HCV cases span multiple states in the Central Appalachian region. Including more areas in the study, as well

as different practice settings, would contribute to a greater understanding of the providers' knowledge and perceptions of screening practices. Next, our results are ED-specific and may not apply to other specialties, such as family medicine, internal medicine, and obstetrics and gynecology. Future data collection and analysis should focus on multiple specialties to address this concern. Lastly, due to survey responses being self-report in nature, there are well-known limitations, including level of honesty of responses from participants, whether patients understand the questions being asked of them, and many forms of response bias. Data on the actual provider screening rates in the EDs and other clinical settings would be beneficial to compare with their responses indicating their likelihood of offering the tests.

Conclusion

This study suggests that ED providers and registered nurses may not be appropriately screening for HCV and HIV per CDC screening guidelines and may not be offering the tests to their patients as a result of their own perceptions of the recommendations. ED providers and nurses should review the most up to date CDC screening guidelines for HCV and HIV, particularly those practicing in the Appalachian region where the opioid epidemic has increased significantly in recent years, increasing the concern for blood borne diseases. Future research should expand on provider knowledge and perception of HCV screening on a wider scale for comparison.

Abbreviations

1. HCV—hepatitis C virus
2. HIV—human immunodeficiency virus
3. HBV – hepatitis B virus
4. EMR—electronic medical record
5. BPA—best practice alert
6. CDC—Centers for Disease Control and Prevention
7. ED - emergency department
8. EM – emergency medicine
9. IVDU – intravenous drug use
10. FOCUS—Frontlines of Communities in the United States
11. MD – Medical doctor
12. DO – Doctor of Osteopathic Medicine

13. APP—Advanced practice providers

14. RN – Registered nurse

Declarations

Ethics Approval and Consent to Participate:

The West Virginia University Institutional Review Board approved the protocol (IRB Protocol #1808219458) as non-human subject research.

Consent for Publication

Not applicable

Availability of Data and Materials

The datasets generated and/or analyzed during the current study concerning specific patient information are not publicly available due to IRB restrictions to protect sensitive information. Survey data is available.

Competing Interests

The authors have no competing interests.

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Authors' Contributions

HM and LN contributed to manuscript writing and data collection.

MS contributed to manuscript writing, editing, and data review.

CB contributed to manuscript writing, supervision, editing, and submission and provided critically important intellectual content during manuscript revisions.

All authors read and approved the final manuscript and take public responsibility for their contributions to the manuscript.

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Table

Due to technical limitations, table 1 is only available as a download in the Supplemental Files section.

Supplementary Files

This is a list of supplementary files associated with this preprint. Click to download.

- [Table1.pdf](#)