Influenza infection control guidance provided to staff at Veterans Affairs facilities for veterans with spinal cord injury during a pandemic[†]

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Context/objective: To assess guidance provided to staff at Veterans Affairs (VA) healthcare facilities on H1N1 influenza infection control for veterans with spinal cord injuries and disorders (SCI/D).

Study design: Cross-sectional qualitative semi-structured interviews.

Setting: Thirty-three VA healthcare facilities from throughout the United States that provide care to veterans with SCI/D.

Participants: Thirty-three infection control key informants, each representing a VA healthcare facility.

Interventions: None.

Outcome measures: Infection control practices, including vaccination practices, hospital preparedness, and recommendations for future pandemics, both in general and specifically to SCI/D.

Results: Most ($n = 26$, 78.8%) infection control key informants believed veterans with SCI/D were at increased risk for influenza and complications, but only 17 (51.5%) said veterans with SCI/D were treated as a priority group for vaccination at their facilities. There was little special guidance provided for treating veterans with SCI/D, and most ($n = 28$, 84.8%) informants said that infection control procedures and recommendations were applied universally. Yet, 10 key informants discussed 'unique challenges' to infection control in the SCI/D population. Informants discussed the potential for infectious agents to be spread through shared and common use equipment and the necessity of including caregivers in any vaccination or educational campaigns.

Conclusion: Greater input by experts knowledgeable about SCI/D is recommended to adequately address pandemic influenza within healthcare facilities where individuals with SCI/D receive care.

Keywords: Infection control, Hygiene, Vaccination, Immunization, Patient education, Veterans, Spinal cord injuries, Paraplegia, Tetraplegia, Influenza, Human, Pandemics, Access to care

Introduction

Individuals with spinal cord injuries and disorders (SCI/D) are at increased risk for influenza infection and complications. They are 37 times more likely to die from influenza than individuals without SCI/D,

even after controlling for age and gender.¹ Among veterans with SCI/D, outpatient visits for pneumonia or influenza are 68 times more likely to result in same-day hospitalization, 10 times more likely to result in hospitalization within 60 days, and 9.8 times more likely to result in death within 60 days than outpatient visits for other respiratory infections.² Due to this heightened risk, infection control in healthcare settings is of extreme importance in this population. Further, during

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an influenza pandemic, additional guidance may be necessary.

The 2009 H1N1 pandemic required a facility-wide response to influenza infection control, and involved resource coordination by Veterans Affairs (VA) infection control personnel. The infection control program located within each VA medical facility is responsible for assessing, preventing, and controlling infections through activities including hand hygiene monitoring, investigating infection clusters within the facility, and employee education.³ During an influenza pandemic, the program has additional responsibilities, including tracking potential/confirmed cases of pandemic influenza, reporting to local/state public health, information dissemination within facilities, and resource allocation decisions.⁴

A large proportion of individuals with SCI/D are veterans eligible for VA benefits.⁵ Other research performed at the same time as this study suggests veterans with SCI/D are frequently male, older, Caucasian, and living with a family member or friend; 67% have paraplegia and they have been injured for, on average, 21 years.⁶ The SCI/D System of Care operates as a 'Hub and Spoke' system. Comprehensive primary and specialty care for veterans with SCI/D is provided at SCI Hubs – SCI Centers that have interdisciplinary SCI care teams and are typically located within large VA medical centers.⁷ SCI Spokes include non-center VA medical centers that have dedicated SCI primary care teams.⁷ To date, there are 24 Hubs and approximately 150 Spokes in the SCI/D System of Care. Infection prevention (vaccinations and patient education) is often delivered as part of routine SCI care. However, due to vaccine shortages during the pandemic,⁸ public health organizations recommended rationing vaccines and provided guidelines to infection control offices on high-risk groups to vaccinate first.

Though SCI was first included as a high-risk group in CDC recommendations for the 2005–2006 influenza season,^{9,10} this group was not explicitly identified in 2009 H1N1 pandemic influenza vaccination guidelines.¹¹ However, individuals with neurologic/neuromuscular disorders, which would include SCI/D, were identified as an initial target group during the pandemic.¹¹ Additionally, since 2002, VA has considered SCI/D to be a high-risk condition warranting annual vaccination.¹⁰ This study assesses guidance provided to infection control staff at Hub and Spoke VA healthcare facilities on influenza infection control for veterans with SCI/D during the 2009 H1N1 influenza pandemic.

Materials and methods

Design

Cross-sectional semi-structured interviews.

Participants

Participants were 33 infection control key informants, each representing a VA healthcare facility. These informants included infection control officers identified as the most appropriate/informed individual to discuss infection control and influenza matters at their facility. Facilities were selected to represent a variety of geographic locations, urban/rural settings, and type of spinal cord facility (Hub, Spoke). Eighteen key informants were affiliated with Hub facilities; 15 key informants were affiliated with Spoke facilities.

Materials

Interviews were guided by an interview script addressing infection control practices, including vaccination practices, hospital preparedness, and recommendations for future pandemics, both in general and specifically to SCI/D.

Data collection

Telephone interviews were conducted by research staff experienced in interviewing techniques. Interviews were audio-recorded and transcribed verbatim by research assistants.

Data analysis

Transcripts were analysed using qualitative coding techniques: descriptive coding, which summarizes in a word or phrase the topic of a passage of text, and in vivo coding, in which a participant's own words are used to name a descriptive code.¹² All interviews were initially coded by one member of the research team to generate the codebook. This coder then met with two additional team members to discuss/refine the codebook. Reliability was examined from independent coding of a set of selected transcripts by all three team members and was very high (94%). Disagreements were resolved through group discussion.

Statement of ethics

We certify that all applicable institutional and governmental regulations concerning the ethical use of human volunteers were followed during the course of this study. This study was reviewed and approved by the Institutional Review Board at Hines VA Hospital.

Results

Risk level of veterans with SCI/D

Most ($n = 26$, 78.8%) infection control key informants believed veterans with SCI/D were at increased risk

for influenza and complications; 11 (33.3%) felt they were high-risk because of impaired cough, and five (15.2%) said their immune systems were compromised. The remaining participants provided multiple explanations, including lack of mobility, greater time spent in healthcare facilities, increased susceptibility to influenza because of other medications and infections, and a belief that SCI/D patients are uninterested in vaccines.

Seven (21.2%) believed veterans with SCI/D were not at increased risk, either because veterans with SCI/D were no different from other patients or because risk should be determined on a case-by-case basis:

‘I do not think they are at a greater risk. Immunologically they are not that different.’ (Infection Control Chair)

‘Individual providers should better know what the risk is for those patients.’ (Infection Prevention Coordinator)

Assessment of risk level did not differ by setting, and key informants from SCI Hubs ($n = 14$) and SCI Spokes ($n = 12$) were equally likely to report veterans with SCI/D were at increased risk. However, among the seven key informants who believed veterans with SCI/D were not at increased risk, informants from SCI Hubs were more likely to believe risk depended on other factors (Hubs $n = 2$, 11.1% versus Spokes $n = 1$, 6.7%). On the other hand, informants from SCI Spoke facilities were more likely to report they were uninformed about risk level (Spokes $n = 2$, 13.3% versus Hubs $n = 1$, 5.6%).

Prioritization of vaccines

Only 17 (51.5%) infection control key informants said veterans with SCI/D were treated as a priority group at their facilities. Facilities where veterans with SCI/D were not a priority group tended to have a small SCI/D population ($n = 4$, 12.1%) or prioritized on characteristics like age ($n = 8$, 24.2%). There were no differences between SCI Hubs and Spokes with regard to prioritization for vaccines; nine (50.0%) Hub and eight (53.3%) Spoke facilities treated veterans with SCI/D as a priority group.

Decisions about the allocation of resources, including vaccines, due to shortages were often made by multiple staff within the facility, most frequently infection control ($n = 13$, 39.4%), emergency management ($n = 10$, 30.3%), chief of staff ($n = 10$, 30.3%), or the hospital director and/or assistant director ($n = 9$, 27.3%). Most decisions were made with no involvement of SCI providers; only six facilities (18.2%), all SCI Hub facilities,

reported involving SCI providers in planning the allocation of resources.

Approach/guidance at facility

There was little special guidance provided for treating veterans with SCI/D, and most ($n = 28$, 84.8%) key informants said infection control procedures and recommendations were applied universally. Some ($n = 3$, 9.1%) felt no special guidance was needed, because they did not think they should be handled differently than other groups or because they felt SCI providers did not need such guidance:

‘I can’t think of anything where we target one group over another. It just doesn’t make sense from an infection control standpoint.’ (Infection Control Director)

Other key informants ($n = 5$, 15.2%) discussed the specific approaches they took for veterans with SCI/D, such as creating targeted educational materials, contacting veterans with SCI/D directly, or involving SCI providers in pandemic planning:

‘When we had limited numbers [of pandemic influenza vaccines] originally, we asked the clinics to contact who they considered high risk and ask patients to come in to get vaccinated. [Spinal cord was] on the list... It took an army to do this.’ (Registered Nurse)

‘[The] SCI unit helped run our flu campaign... We couldn’t have run our program without spinal cord... They were some of our champions. They were the best.’ (Infection Control Chief)

Key informants from SCI Hubs/centers were more likely to report special guidance for treating veterans with SCI/D within their facility ($n = 4$, 22.2%) than key informants from SCI Spoke facilities ($n = 1$, 6.7%).

Unique challenges

Though only five key informants discussed any special approaches to individuals with SCI/D carried out during the pandemic, 10 (30.3%) key informants discussed ‘unique challenges’ of the SCI/D population, characteristics of these veterans that would demonstrate a need for a different approach. One informant discussed the risk of spreading infection through common use and shared equipment:

‘There are unique challenges in that population... We have organisms that normally need to have contact precautions, and yet they get out of their room... A lot of them are wheeling... both in and out of contact isolation or whatever kind of

isolation they're on, we just really have to work on wiping down the environment, and hand hygiene, and doing the best we can to limit contamination of common use items and objects that are shared.' (Hospital Epidemiologist)

Additionally, four key informants discussed unique challenges with regard to vaccination of veterans with SCI/D. Though veterans are able to receive free influenza vaccinations at VA facilities, these individuals frequently have caregivers who are not eligible for VA benefits, which poses an additional challenge to infection control:

'A lot of SCI patients have caregivers who are not veterans, but that can spread flu to the veteran.' (Infection Control Nurse)

Finally, accessibility of vaccines is also an issue in this population, due to differences in mobility:

'We have to make sure [vaccines are accessible]... We have a walk-in flu clinic, but SCI patients are not going to be as able to come to walk-in flu clinics; [they're] not as mobile.' (Infectious Disease Chief)

Recommendations for approaches/resource needs

Table 1 provides information on informant recommendations for additional approaches. Infection control key informants frequently recommended more education of veterans with SCI/D to encourage infection control measures ($n = 15$, 45.5%), especially to counteract the unique challenges discussed previously:

'Someone who specializes in education in that population could help to intimate what their unique risks are in relation to infection control.' (Infection Control Nurse)

Informants also recommended greater availability of vaccines for veterans with SCI/D, and especially their providers and informal caregivers and other family members ($n = 11$, 33.3%), who can spread influenza to veterans with SCI/D, though the vaccine shortage may have explained recommendations for greater vaccine availability:

'SCI patients have more exposure to health care. [They are] in and out of healthcare facilities more often, [and have] greater use of homecare providers, which puts them at greater exposure [to] germs.' (Infection Control Nurse)

'If staff is not vaccinated, then patients are always at risk.' (Infection Control Specialist)

Additionally, some informants ($n = 4$, 12.1%) discussed the need for more guidance from public health organizations and VA leadership on whether additional focus on veterans with SCI/D is needed:

'VA Central [Office] should provide specific guidelines on whether we should put more focus on this group. Our SCI population is small so we don't put a lot of focus on this group.' (Infection Control Specialist)

Discussion

Over 20% of infection control key informants felt that veterans with SCI/D were not at increased risk for influenza infection and/or adverse outcomes. Further, infection control key informants often relied upon SCI providers to use their awareness of patient risk in provision of SCI care. However, given that few facilities involved SCI providers in decisions about allocation of limited resources, including vaccines, during the pandemic, SCI providers may lack the resources necessary to effectively treat and prevent pandemic influenza

Table 1 Recommendations for additional approaches to infection control, overall and by type of facility

Recommendations for additional approaches*	Overall ($n = 33$) n (%)	Hubs ($n = 18$) n (%)	Spokes ($n = 15$) n (%)
Education or information	15 (45.5)	10 (55.6)	5 (33.3)
More vaccines or vaccination	11 (33.3)	7 (38.9)	4 (26.7)
Additional support from providers or leaders	7 (21.2)	5 (27.8)	2 (13.3)
Additional staff	5 (15.2)	3 (16.7)	2 (13.3)
More guidance from VA	4 (12.1)	1 (5.6)	3 (20.0)
Isolation rooms or policy	3 (9.1)	2 (11.1)	1 (6.7)
Flow management policy	2 (6.1)	1 (5.6)	1 (6.7)
Home care coordination	2 (6.1)	1 (5.6)	1 (6.7)
Increased access to care	2 (6.1)	0 (0.0)	2 (13.3)
Risk assessment or research	2 (6.1)	1 (5.6)	1 (6.7)
Target caregivers	2 (6.1)	2 (11.1)	0 (0.0)
Ventilation support	1 (3.0)	1 (5.6)	0 (0.0)

*Participants frequently recommended multiple approaches.

infection in veterans under their care. Moreover, only half of infection control key informants said veterans with SCI/D were given first priority for vaccines, and only 15% discussed any approaches or guidance specific to SCI/D.

Research suggests that individuals with SCI/D are at increased risk for respiratory complications,¹³ and could benefit from influenza vaccination. Mortality from influenza is higher among individuals with SCI/D than in the general population.^{1,14,15} Further, respiratory complications are a leading cause of death in individuals with SCI/D.^{15,16} Individuals with SCI/D have been shown to have similar immune responses as able-bodied individuals, meaning individuals with SCI/D would experience similar benefits of annual influenza vaccination.¹⁷ Despite increased risk, however, research from another arm of this study performed at the same time as these interviews found only 58% of veterans with SCI/D reported receiving the H1N1 influenza vaccine during the pandemic.¹⁸ Together, these findings highlight the need for increased attention and support for healthcare providers caring for individuals at high-risk during an influenza pandemic, as well as greater involvement in facility pandemic planning by experts in caring for individuals with SCI/D.

Some infection control key informants identified unique challenges in infection prevention in the SCI/D population, including a potential for infectious agents to be spread through shared and common use equipment. Previous research has found that these items can spread a variety of infections.^{19–23} Frequent cleaning of these items with a disinfectant, particularly equipment that is shared, combined with better hand hygiene after handling these items, is one way to prevent the spread of infection.²⁴

Key informants also discussed the necessity of including veterans' caregivers and residential family members, in any vaccination or educational campaigns, because of the potential for these individuals to spread influenza to veterans with SCI/D. Additionally, individuals with SCI/D could lose access to vital services if their caregivers also become ill.²⁵ Further, Baron *et al.*²⁶ argue that, because informal caregivers often have health issues as well, they could be at increased risk for influenza infection and complications, and should be considered a priority group for vaccination during pandemics.

Overall, greater input by providers knowledgeable about SCI/D care is necessary to adequately address pandemic influenza within healthcare facilities caring for individuals with SCI/D. This is especially important when an individual outside of the SCI/D System of

Care is in charge of decisions about resource allocation and prioritization of vaccines, as was the case in more than 80% of the facilities included in this study. Infection control key informants employed at Spoke facilities were less likely to report being aware of special guidance about individuals with SCI/D, although even at SCI Hub/center facilities, reports of special guidance were infrequent as well. Furthermore, organizations responsible for influenza infection control guidelines and pandemic influenza planning could also involve individuals with SCI/D to ensure their unique needs are addressed.²⁵

Limitations

Responses were provided by a single key informant from each VA facility. Each individual was selected because he or she was deemed most knowledgeable about infection control activities in general within the facility, but these informants may not have been aware of all special activities being organized and carried out by individual service lines, such as SCI/D.

Future directions

Additional guidance on influenza infection control for individuals with SCI/D is needed to improve prioritization of vaccination among individuals with SCI/D. As this study suggests, there is a need for SCI healthcare providers to communicate with infection control officers about unique patient health and resource needs. On the other hand, infection control officers need to proactively disseminate information about priority groups and available resources, to balance limited resources and general needs with high-risk needs. Lessons learned from this study may inform pandemic planning specific to SCI/D as well as seasonal influenza prevention efforts, both within the VA SCI/D System of Care, as well as in non-VA facilities caring for individuals with SCI/D. However, more research is required to better understand what infection prevention information would be most beneficial for healthcare facilities and providers serving this population.

Conclusion

Although the intent of the interviews with infection control officers was to obtain information about what might facilitate infection prevention strategies for this high-risk population at the facility or system level, frequent recommendations were made for strategies such as patient education, healthcare provider vaccination, and caregiver/family vaccination. This suggests that infection control officers are advocating infection prevention at several levels to alleviate the multiple ways

of transmission into the healthcare setting. Doing so may likely reduce the burden of prioritization dilemmas and hospital-wide resource shortages during pandemics and other emergent events.

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