ISSN: 2573-9506

Research Article

International Journal of Women's Health Care

Challenges to Implementation of an Incognito Embedded Patient Simulation Program to Improve System-Wide Public Health Threat Preparedness

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Submitted: 16 Nov 2017; **Accepted**: 23 Nov 2017; **Published**: 06 Dec 2017

Abstract

Introduction: *Preparing a healthcare system for a special pathogen such as Zika Virus requires that frontline staff be trained to screen, test, educate and counsel at risk patients. The purpose of this manuscript is to describe an innovative intervention that includes an incognito embedded patient simulation and highlight solutions to challenges encountered during implementation.*

Methods: *Incognito embedded patient simulations focusing on Zika preparedness were performed throughout 14 different institutions within one urban healthcare system that provide prenatal care. Challenges to safely and efficiently deploy the program were cataloged.*

Results

Several key challenges were identified:
1) Creation of a patient within electronic health record
2) Ensuring proper patient identification
3) Securing the correct type of patient appointment
4) Patient testing congruent with patient condition
5) Data collection during simulation
6) Maintaining psychological safety before, during, and after a simulated event.

Conclusions: *This manuscript provides practical solutions to pitfalls encountered while conducting multiple incognito embedded patient simulations to a large, diverse healthcare system.*

Keywords: Zika, Special Pathogens, Hospital Preparedness, Healthcare System, Incognito Patient, Mystery Patient Drill.

Introduction

Zika virus, which is spread mostly through the bite of an Aedes species mosquito, has emerged as a global health threat. With causal link to microcephaly and other abnormalities of the central nervous system in neonates, obstetric settings must be able to effectively screen for and test affected communities to limit and prevent its impact. As 80% of patients who are infected with Zika have no

symptoms1, this virus poses unique public health challenges [1,2].

Building upon a framework that was established in 2014 to screen patients for possible exposure to Ebola virus disease (EVD), NYC Health + Hospitals, the largest municipal health care delivery system in the United States, implemented a Zika Preparedness and Response Action Plan (Zika Action Plan) to address the threat from Zika and ensure appropriate patient care. The plan includes 1) universal travel screening which was augmented to include surveillance for Zika for early recognition and management of persons with Zika virus infection 2) signage depicting areas with active Zika virus transmission 3)algorithmic protocols detailing criteria for clinical and epidemiologic evaluation for possible Zika virus exposure in pregnant, non-pregnant females, males, pediatric and neonatal populations based on guidance from the Department of Health (DOH) and the Centers for Disease Control and Prevention (CDC) 4)diagnostic testing for Zika virus infection5) consideration of alternate diagnosis, as appropriate, including chikungunya virus and dengue virus, among others, 6)linking of infected patients to appropriate specialists; and 7) education on Zika virus disease and preventive measures (e.g., avoiding travel to areas with active Zika virus transmission) [3].

To ensure that NYC Health + Hospitals obstetrical units, which deliver more than 20,000 babies each year are adequately screening for Zika virus and offering diagnostic testing and education on Zika virus infection, a series of incognito embedded patient Zika Simulation Drills (ZSD) were conducted at all 14 of NYC Health + Hospitals prenatal clinics. Incognito embedded participants have been used in several practice settings to ascertain quality of care, but there is little discussion about its role in system preparedness [4,5].

The Zika Simulation Drills focused on assessing compliance and improving performance in three main areas: (1) recognition of Zika risk factors, (2) availability of educational materials and (3) completeness of Zika-related patient counseling.

The purpose of this manuscript is to highlight some of the challenges and solutions to implementation of an incognito embedded participant simulation program across a large healthcare system to enhance preparedness for a public health threat such as Zika Virus.

Methods

The Intervention

Between July 29, 2016 and September 2, 2016, incognito embedded patients Zika Simulation Drills were conducted within14 NYC Health + Hospital facilities, including12 hospital-based prenatal clinics and 2 outpatient clinics.

The steering team was composed of simulation and special pathogens preparedness leadership. This core team interfaced with many other areas of the health system including the leadership at each institution as well as information technology staff, laboratory services, and public relations. The core team met weekly to discuss progress of the program and how to navigate challenges. The embedded participants were Simulation Center staff or fellows. The individuals spanned a variety of healthcare disciplines and all regularly participate in the execution of simulation-based activities. Embedded participants would enter the clinical areas and act as a patient with a history of potential Zika exposure. A typical history of the embedded participant is as follows:

34 year-old primigravida with an LMP of 5/2/2016 and EDC of 2/5/2017 who was in Aruba June 24-July 1, 2016 presents for a return OB visit. She had one visit prior at 6 weeks gestation (second week of June). She denies any Zika-related symptoms (no fever, no ocular pain, no rash) but reports that she had several mosquito bites while she was in Aruba. Her partner, with whom she has been having regular unprotected intercourse, did not travel to Aruba.

- No significant past medical/surgical/obstetric/gyn history.
- No drug allergies.
- Medications: prenatal vitamin
- Social history: accompanied by partner (or friend)

Data Collection

Information pertinent to managing a potentially Zika-exposed patient was collected through direct observation over the course of ZSD by the embedded participants. The embedded participant noted whether appropriate screening for Zika risk factors was performed and whether educational materials were available and offered. Four aspects of patient counseling were evaluated for completeness: modes of Zika transmission, risk of exposure, fetal risks, and partner exposure. Prenatal clinic staffs were rated by the incognito embedded participants as having delivered complete or partial information related to each counseling area. Occasionally one of the four elements was not mentioned by staff. In these cases, the embedded participants would prompt staff using questions specific to that element. For two facilities the embedded patient was revealed as a simulated patient and patient counseling did not ensue.

Debriefing with the facility staff to improve public threat awareness

At the conclusion of the ZSD at each respective prenatal clinic, or scheduled at a later date, a debriefing was held. This included clinical and administrative leadership of the prenatal clinic, including the facility's chief medical officer, chief nursing officer, infection control personnel and emergency department clinical and administrative leadership as well as the simulation team and zika subject matter expert. Areas of strength, weakness, and improvement were discussed for each prenatal-specific ZSD.

The debriefing also provided opportunity for the Zika subject matter expert to share evolving up-to-date information with the clinical leadership. This included:

- Positioning of Zika signage/posters for greater visibility;
- improving universal travel screening to ensure all patients are screened for travel history, especially to areas of active Zika virus transmission for the pregnant population;
- optimizing Zika diagnostic testing when appropriate travel and/or epidemiological linkage to Zika virus is established; providing Zika educational material to all who screen positive for Zika virus through initial travel and/or epidemiological linkage;
- Directing prenatal clinic staff to educational material provided by the Department of Health and the Centers for Disease Control and Prevention to boost Zika competency.

Following each drill, embedded participants and simulation educators would debrief the experience. Debriefings would address the simulation-related issues that were identified during the drills that posed conflicts to the flow of the exercise. These simulation issues would then be attempted to be addressed during the planning stages of the next exercise which was difficult with tight timeframes.

Results

A total of 14 drills were completed over 5 weeks. In order to safely and successfully conduct a visit, a number of simulation-related issues had to be addressed:

1. Creation of a patient within the electronic health record:
   Unique patient profiles, including medical record and identifying details, needed to be placed into the electronic health record.
2. Ensuring proper patient identification:
   our embedded participants needed proof of their identity to our reception staff. Since these aliases were made up, our embedded patients did not possess any identification that matched their alias.
3. Securing the correct type of patient appointment:
   In order to allow our secret shopper to be seen by an OB practitioner, our patient had to have a positive urine pregnancy test in the system.
4. Patient laboratory testing congruent with patient condition:
   During simulations, the incognito embedded participants, none of whom were actually pregnant, were often asked to provide a urine sample for a confirmatory pregnancy test.
5. Data collection during simulation:
   Embedded participants needed to be able to collect a substantial amount of information, including time stamps during their encounter.
6. Maintaining psychological safety before, during, and after a simulated event:
   As these simulation drills were without notice to the staff working in the clinics, the psychological safety of participants needed to be addressed in a manner that may be slightly different from a center-based approach.

Discussion

The Zika Simulation Drills were informative for NYC Health + Hospitals preparation and response to actual cases of Zika virus within its health care delivery system. Deploying such a large simulation-based program requires careful planning and execution. The results highlight challenges faced in delivering such a program and potential solutions.

Creation of a patient within electronic health record

The creation of a patient medical record within the "test" areas of our electronic systems was ruled out, as it would create an immediate red flag for staff interacting with the patient. Instead, our team opted to construct patient identity that would be entered into our live patient records systems. The enterprise health information team aided in the creation of these charts and identified the necessary components were complete. This patient would need to be deleted from the system post simulation.

Ensuring proper patient identification

Once aliases for the embedded participants were created, the next challenge became demonstrating identity to reception staff. Since these aliases were fabricated, our embedded participants did not possess any identification that matched their alias. We provided our patients with an altered utility bill that displayed the name and address of their alias. We then instructed the embedded participants to inform reception staff that they did not have their wallet, but they had a utility bill that displayed their name and address. Most reception staff insisted on photo identification and were unwilling to accept the utility bill as identification. After two visits complicated by the same issue and remedied only by seeking out a registration supervisor and explaining the true identity of the shopper and the real reason for the visit, it was clear that another modality of identification would be required. After consultation with senior administration, it was determined that a "clinic card" – a standardly issued card to all patients, that matched the alias of the embedded participant would suffice as adequate identification to reception staff.

In order to obtain the clinic card prior to the simulated event, the simulation team coordinated with leadership in the billing departments of each facility to authorize the creation of the clinic card. Since there is no "master list' of staff members in this title, often several calls to each of the facilities was used to ultimately find the right person in the Billing or Finance offices, to create the clinic card. Once the billing offices understood what was trying to be accomplished, they happily obliged, and often met our embedded patients in secluded areas of our facilities to pass along the clinic card.

Securing the Correct Type of Appointment

In order for the embedded participant to be seen by a prenatal care practitioner, our patients needed to have a positive urine pregnancy test. Since none of our shoppers were able to pass this test on their own, we had to revise the scenario and have our secret shopper present for a return OB visit. This meant they would not be asked to confirm their pregnancy at the visit. We enlisted the assistance of our central administrative offices to input a return OB appointment at the date and time we desired. This approach worked for many of our sites, but not all. A few registrars still continued to red-flag our secret shoppers. Registrars noted the clear return appointment in their name on the schedule; however, the embedded participant possessed a newly issued clinic card and had no history in the system of previous appointments. These sessions necessitated a consultation with the registration supervisor by our shopper's partner to facilitate the visit and allow the drill to proceed.

We briefly considered revising the scenario to have our secret shopper present as a new OB patient, and carry a control solution to mimic a positive urine pregnancy test. However, after consultation with our laboratory leadership, it was determined that the generation of false lab reports would add an additional layer of complication to the medical record of these fictitious patients. We abandoned the idea and continued on with our secret shopper as a return OB visit, despite its many layers of complication. It was admirable that our clerical employees are so vigilant in verifying patient identification and red-flagging accounts that just didn't look right in order to protect the integrity of our patient data.

Patient laboratory testing congruent with patient condition

As none of the incognito embedded participants were actually pregnant, a simulation realism hurdle was encountered when they were asked to provide a urine pregnancy test to confirm pregnancy. To overcome this hurdle, the embedded participant would state that they needed to drink additional water before being able to provide a specimen and continue with the triage process. Future directions include the use of pregnant embedded participants or securing a safe, ethical, and reliable substance to produce a positive pregnancy test.

Data Collection During The Intervention

Embedded participants were coached on the various parameters to be collected. They also maintained a snapshot of the data collection sheet on their phone as an aid. As use of smart phones is commonplace, the

embedded participants utilizing their phones during the simulations was not unusual. It was apparent however, that overusing the phone might cause staff to become suspicious.

Maintaining safety

Simulation within the clinical environment can pose hazards, including disruption of actual care as well as threat to the psychological safety of staff [7]. In order to maintain a safe clinical, as well as psychologically safe environment before, during, and after the simulated events, many steps were taken.

First, the embedded participants were Simulation Educators who were aware of the importance of creating a psychologically safe context for learning [6].The debrief was initiated with introductions, the purpose of the intervention to clarify objectives and a narrative regarding the case and how the embedded patient progressed through the clinic.

Although after the event, as being incognito was important to the intervention, the limitations of the simulation event were acknowledged. These limitations may have caused delays, or suspicion that the embedded patient was not real. Addressing these limitations at the start of the debrief prepares the learners (the facility staff) to discuss the process issues identified and mitigates the unrealistic qualities that may affect performance. As Rudolph et al. describe, a "fiction contract" is made with the participants in order to maximize focus on the objectives of the intervention6. In two situations where counseling did not ensue because the embedded participants were revealed, the embedded participants clarified the purpose of the exercise with clinic staff and offered an opportunity to ask questions. We found that even when a scenario did not work out as planned, participants were still able to engage in meaningful debriefs that helped leadership learn about managing Zika exposed patients.

Using a skilled debriefer was also deliberate to facilitate powerful information generating conversations. Applying tools like plus/delta (focuses on identification of things that are going well in addition to opportunities for improvement) as well as advocacy inquiry required the debriefer to approach the participants with curiosity and the opportunity to learn about underlying frames/perspectives regarding process. The debriefer maintains attention to psychological safety, and focuses on a commitment to respect the perspective of the learners.

Finally, having a subject matter expert present during the drills was key. Many questions arose during the debrief about Zika and its management. Having the expert to address those concerns offered new opportunities to address process improvement.

Conclusion

Utilizing healthcare simulation through unannounced incognito embedded patient scenarios proved to be a valuable technique in testing the system preparedness for Zika virus. Recognizing the challenges of implementing such a program will allow for more efficient deployment of simulation as regular practice for future public health threats. Careful preparation and planning, and particularly analyzing how patients flow through the system is key to delivering a simulation that reflects the flow of a real patient. Areas for further research include generalizing the intervention as a regular means to assess hospital system preparedness for all public health threats.

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