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ORIGINAL ARTICLE

Leveraging corona virus disease 2019 vaccination to promote hepatitis C screening

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Abstract

Health care initiatives, such as hepatitis C virus (HCV) screening, have been greatly overshadowed by the corona virus disease 2019 (COVID-19) pandemic. However, COVID-19 vaccination programs also provide an opportunity to engage with a high volume of people in a health care setting. We collaborated with a large COVID vaccination center to offer HCV point-of-care testing followed by dried blood spot collection for HCV RNA. Additionally, this opportunity was used to evaluate the practical significance of a 5-minute version of the OraQuick HCV antibody test in lieu of the standard 20-minute test. We tested 2317 individuals; 31 were HCV antibody positive and six were RNA positive of which four were treated and reached sustained virological response. Over a third of those surveyed said they would not have participated had the test required 20 minutes. *Conclusion*: Colocalizing HCV testing and linkage to care at a COVID vaccination clinic was found to be highly feasible; furthermore, a shortened antibody test greatly improves the acceptance of testing.

INTRODUCTION

To achieve the World Health Organization's goal of eliminating hepatitis C virus (HCV) as a public health threat by 2030,[1] extensive efforts are needed to increase screening and linkage to care. During the corona virus disease 2019 (COVID-19) pandemic, screening for HCV in Ontario stalled, as it had in many places,[2–4] with HCV antibody testing during the first three waves decreasing by 35%, 21%, and 19%, respectively. Screening rates had failed to return to prepandemic levels by the end of the third wave.[5]

Simultaneously, considerable resources were allocated to vaccinate all eligible people living in Ontario, Canada. Strategies that pair COVID-19 vaccination with screening for HCV provide an opportunity to leverage one public health problem to address another. The Viral Hepatitis Care Network (VIRCAN) runs community-based outreach efforts to realize the World Health Organization's HCV elimination goals. We offered point-of-care HCV antibody (Ab) testing followed by dried blood spot (DBS) collection for HCV RNA at a large COVID-19 vaccination clinic at Canada's largest mental health facility. Here, we

report uptake, HCV positivity, and linkage to care from that initiative.

MATERIALS AND METHODS

We tested for HCV at the Centre for Addiction and Mental Health (CAMH) in Toronto, Ontario, where COVID vaccination was open to outpatients, staff, and members of the public. HCV testing and linkage to care was carried out by one to three trained non-medical staff, depending on patient volume. Before outreach efforts, we printed posters inviting people to be tested for HCV; these posters were posted outside the clinic where people lined up for the COVID vaccine, as well as in the clinic itself. In addition, vaccination staff were reminded each day that HCV testing was available and were asked to mention it to vaccine recipients. Following COVID vaccination, recipients were directed to an observation area to sit for 15 minutes.

People were approached throughout the 15-minute waiting period by the HCV outreach team and were offered point-of-care HCV Ab testing (OraQuick HCV). Outreach counseling included the following information: (1) the test required one drop of blood from a finger prick, (2) results would be available in 5 minutes, and (3) if positive, there would be a follow-up test to confirm infection. Potential participants were also counseled on the prevalence of hepatitis C, that a large percentage of individuals with hepatitis C are unaware of their infection, that recent developments have led to simple curative treatments, and that there is no HCV vaccine. Interested individuals were escorted to a station near the exit, where HCV testing staff recorded their name, phone number, age, sex, the first half of their postal code, whether they had ever been tested for HCV before, and whether they had any affiliation with CAMH, either as staff or as a patient.

The test was then administered according to the manufacturer's instructions, with the exception of shortening the test read time from 20 minutes to 5 minutes. Earlier work by VIRCAN demonstrated this test is reliably positive within 5 minutes for individuals who are viremic.[6] To explore the impact of the shortened time on test acceptability, we performed a simple exit survey for 3 out of 24 weeks, asking all participants: "Would you have said 'yes' to being tested if the test took 20 minutes instead of 5?"

Individuals found to be HCV Ab positive were privately counseled about the result and asked to provide another blood sample. In Ontario, only three pieces of information are required for DBS testing: name, date of birth, and date of collection. In addition, we requested more detailed information, if available, to reduce the chance of loss to follow-up: Ontario Health Insurance Plan number, address, phone number, email, primary care provider's name, pharmacy name and address, mental health/social worker contact, and an alternate contact, such as a family member or friend. The subsequent sample, also obtained by finger prick, was captured on a DBS card and sent for HCV RNA testing (Figure 1A). Concurrently, the person was connected by phone with an HCV treatment nurse or doctor to discuss potential outcomes of the RNA test and follow-up treatment.

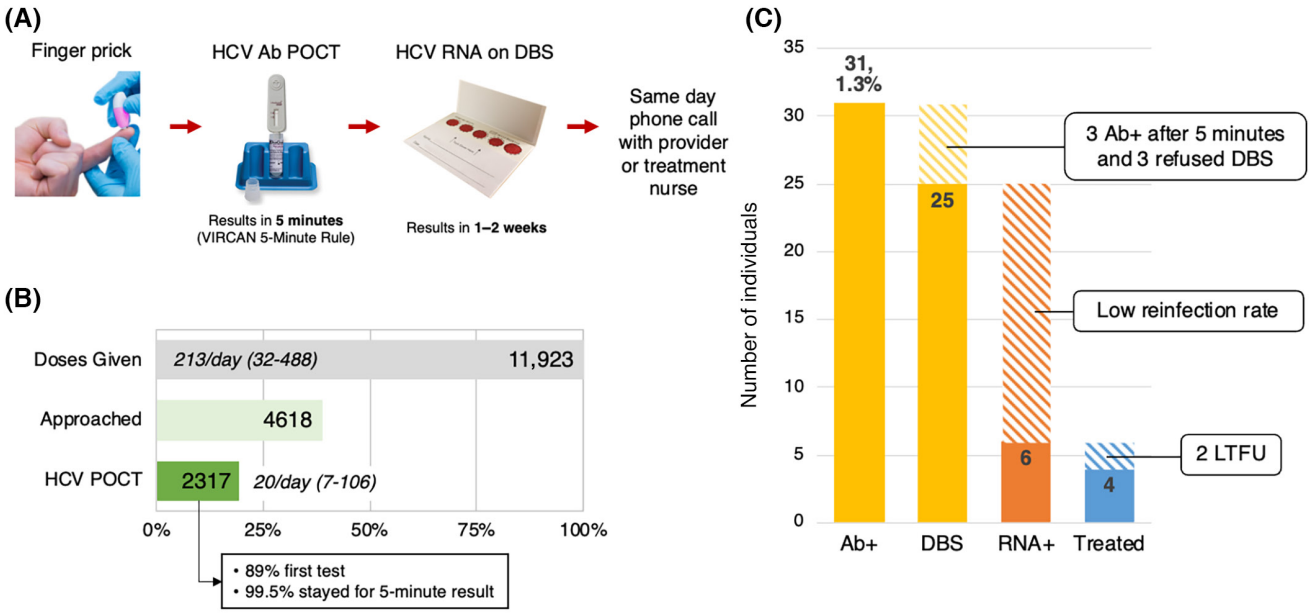

FIGURE 1 Workflow and results. (A) Testing steps and linkage to care. (B) Participation in the program. (C) HCV Ab and RNA results. Ab, antibody; DBS, dried blood spot; HCV, hepatitis C virus; LTFU, loss to follow-up; POCT, point-of-care testing; VIRCAN, Viral Hepatitis Care Network.

RESULTS

From May to September 2021, we tested 2317 of 4616 people who were approached at the COVID vaccine clinic (50.1% acceptance rate). In total, 38.6% of all vaccine recipients were approached for testing (*n* = 4616/11,953) (Figure 1B). The majority of those tested (61%, *n* = 1417) were members of the public; 12% (*n* = 279) were CAMH staff; 8% (*n* = 192) were CAMH mental health outpatients; and 19% (*n* = 429) did not disclose their relationship with CAMH. Most (63.9%, *n* = 1481) did not think they had ever been tested for HCV, and many (26%, *n* = 604) were uncertain. Ten percent of people had a prior test history (*n* = 232/2317). Of those, seven were already aware of being antibody positive and used our program as an opportunity to connect to HCV RNA testing and/or linkage to care. On average, 20 people were tested each day, with a considerable range from day to day (7–106), depending primarily on the volume of people arriving for vaccination.

For those who declined to be tested when approached, the most common reasons given were "not interested"; "overwhelmed/vaccination is all I can handle today"; "I don't like needles/fingerpricks"; and "I was tested elsewhere." Of the 2317 who underwent testing, 2304 (99.4%) stayed for their 5-minute result. During the 3 weeks when participants were asked, "Would you have said 'yes' to being tested if the test took 20 minutes instead of 5?", 256 people participated in the program. Of those, 53% (*n* = 135) said they would still have accepted; 36% (*n* = 91) said they would have forgone testing; and 12% (*n* = 30) did not respond.

Of the 2317 people tested, 31 (1.3%) were HCV Ab positive, 25 of whom (80.6%) had a DBS collected for HCV RNA testing (Figure 1C). Of the six who did not provide a DBS, three were detected within 5 minutes but refused further testing. The remaining three individuals had left by the time their results became positive (between 5 and 20 minutes); these people were contacted by phone, advised of the implications, and were provided options to complete HCV RNA testing. Of these three, one was retested by their primary care provider and found to be HCV Ab negative, one was already aware of having been exposed to HCV years before and had a resolved infection, and no data were available from the third individual. For the 25 individuals who provided DBS samples, six were found to be HCV RNA positive (24%). Four of the six individuals who were viremic were treated and cured, two were lost to follow-up. One of the four people treated was aware he was infected and had delayed addressing the problem until engaged in this program. He was found to have cirrhosis before treatment initiation.

Men had a higher prevalence of HCV Ab compared to women (1.9% vs. 0.8%). Individuals in the 1945–1975 birth cohort (46–76 years) had a higher Ab prevalence (1.8%) compared to groups older and younger (0.9% for <35 years, 1.3% for 35–45 years, and 0.0% for 77+ years). HCV Ab prevalence among outpatients of CAMH was higher compared to the public and staff (2.6% [*n* = 5/192] vs. 1.0% [*n* = 17/1696]), consistent with published data that show that HCV prevalence is higher in marginalized populations, particularly those with substance use and mental health disorders. [7–9] In individuals who declined to identify as patients, staff, or members of the public, the prevalence was 2.1% (9/429).

DISCUSSION

Colocalization of HCV testing with COVID-19 vaccination overcame some of the reduction in testing during the pandemic. It also provided an opportunity for evaluating the practical importance of the 5-minute read time (VIRCAN 5-minute rule) versus the standard 20-minute read time. Evidence presented here suggests that 36% of people who participated would have forgone a 20-minute test. In addition, 99.4% of those who agreed to be tested stayed for results when using the shorter test. In previous public screening efforts by VIRCAN using the standard 20-minute read time, 18.5% (282/1582) left before getting their test results,[6] many of whom were never reached by phone. In contrast, in this setting, only 0.56% (13/2317) left before receiving their results, an improvement of loss to follow-up of over 30-fold.

This initiative complemented the COVID vaccine program and demonstrated the benefit of colocalizing care. The very high COVID vaccination rates in Toronto (>90% according to a March 21, 2022, news release[10]) underscores that the COVID-19 vaccine clinics were attended by the majority of the population and not a small self-selected subsection. That greater than 50% of those approached accepted HCV testing suggests the setting itself—getting vaccinated for one disease—encourages being tested for another. The testing program was not resource intensive as it required one to three, trained, nonmedical staff members; and according to COVID vaccination clinic staff, testing did not interfere with the vaccination program.

One of the reasons CAMH was chosen to pilot this program was the expectation that we would have the opportunity to engage many patients who use the services of the mental health center, a population known to have a high prevalence of HCV infection. As expected, this group had the highest HCV Ab prevalence (2.6%). It is possible that many of the 18.5% who declined to identify as patient, staff, or member of the public were also patients of CAMH. This group had the second-highest prevalence of HCV Ab positivity (2.1%, *n* = 9/429).

As the COVID-19 pandemic continues to change, there may be additional opportunities to incorporate

HCV testing into programs that already have government investment. The emergence of variants with decreasing vaccine sensitivity strongly suggests continued COVID-19 vaccination will be required, both as further boosters and very likely with novel vaccines. Furthermore, the success of COVID-19 vaccination may well be used as a model for other vaccination efforts, particularly in high-risk populations (e.g., hepatitis A vaccine and influenza vaccine in marginalized populations), demonstrating that this simple and effective approach of colocalizing HCV testing with vaccination could inspire similar programs even if not directly related to COVID-19 vaccination. Strategies to increase HCV screening to make up for reductions in testing during the pandemic will be required to meet elimination targets in Ontario and elsewhere.

Limitations of this report include the lack of detailed demographics of those who accepted being tested compared to those who declined. A limitation of the evaluation of the 5-minute rule was that it was confined to a survey question. An experiment would have been a more rigorous test of the relative importance of reducing the test to 5 minutes from 20 minutes (e.g., offering one or the other in that setting on alternate days to see how that impacted uptake). However, the single question asked, "Would you have said 'yes' to being tested if the test took 20 minutes instead of 5?" was designed to be robust in that the tendency to reply "yes" to a question—known as acquiescence response bias[11]—would, in this case, underrepresent the significance of the 5-minute test, if answered "yes."

In summary, colocation of HCV testing at COVID-19 vaccine clinics takes advantage of the extensive resources allocated to fighting COVID-19 to help address HCV. Here, we demonstrate that this resource-friendly approach can be highly effective at engaging participation. Ideally, this work will provide an example that can be replicated and expanded, particularly to complement vaccination outreach efforts toward populations who have a higher prevalence of HCV infection. Leveraging resources for COVID-19 to address HCV and other public health problems warrants further investigation.

CONFLICTS OF INTEREST

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