COVID-19 AMONG RACIALIZED COMMUNITIES: UNRAVELLING THE FACTORS PREDICTIVE OF INFECTION AND ADVERSE OUTCOMES

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Abstract

The COVID-19 pandemic has highlighted the potential impact of factors that enhanced disparities in health outcomes across different population groups in Canada. The opportunity exists to work closely with these communities in a timely manner to determine the factors that are most associated with COVID-19 and severe illness. Careful messaging and information sharing are important to avoid misconceptions and reduce the chances of stigmatization. This work should be accompanied by an appropriate knowledge translation strategy to ensure that the information generated is of value to the community and is shared in an appropriate manner. Introduction: The current COVID-19 pandemic is arguably the most devastating infectious illness

Introduction

The current COVID-19 pandemic is arguably the most devastating infectious illness that has affected humans since the great influenza pandemic of 1918-1919. The pandemic is caused by infection with severe acute respiratory syndrome coronavirus-2 (SARS-CoV-2), a novel human coronavirus. Its novelty means that the human immune system would not have previously encountered it and as such, humans have no pre-existing immune defense against the virus. The SARS-CoV-2 is one of seven coronaviruses that affects humans. While some coronaviruses are responsible for common respiratory infection each year, these infections are typically mild. Prior to the advent of SARS-CoV-2, the human coronaviruses (HCoVs) that were most associated with severe illnesses were SARS-CoV-1 and the Middle East Respiratory Syndrome coronavirus (MERS-CoV). The pandemic caused by SARS-CoV-2 has had profound consequences for all population groups around the world. While all age groups are affected by this latest coronavirus disease, known as COVID-19, in Canada approximately 90 per cent of cases occur among individuals older than 19 years of age [1]. As of October 25, 2020, Canada has had more than 215,000 cases and close to 10,000 deaths (about 5 per cent). The vast majority of cases are not associated with travel links (92 per cent), suggesting acquisition within Canada. The majority of cases (79 per cent) and deaths (93 per cent) have been reported from the provinces of Quebec and Ontario [1].

Risk factors for severe outcomes include older age, immunocompromising conditions and medical comorbidities, among other factors [2-4]. Data from the United States have shown that individuals from African-American and Hispanic populations are overrepresented in groups with poor outcomes, including hospitalizations and mortality [5]. Similarly, in the United Kingdom (UK), individuals of African ancestry have been shown to be more than twice as likely to die from COVID-19 compared with their white counterparts, even when one adjusts for some socioeconomic factors as well as comorbidities [6]. In this regard, an analysis of 3370 people admitted to intensive care units in the UK with confirmed COVID-19 found that 402 (11.9 per cent) were black, 486 (14.4 per cent) were Asian, and 2236 (66.4 per cent) were white, compared with the respective national population figures of 3.3 per cent, 7.5 per cent, and 86.0 per cent [7]. In addition, in the UK, there have been cases among children of a multisystem inflammatory disease syndrome that resembles an illness referred to as Kawasaki disease. Among this group of

individuals, African-Caribbean children were overrepresented, making up six of eight children with this rare syndrome [8].

In the above context, it is clear that there are signals that would suggest that the African-American and African-UK populations may be at increased risk of adverse outcomes from COVID-19. Data have emerged in Canada to suggest that African-Canadians are disproportionately affected. In this regard, data generated by the City of Toronto show that Black people are disproportionately represented among COVID-19 cases [9]. Individuals who are most affected live in neighborhoods with low median family incomes compared with those least affected. Families with household incomes of greater than $150,000 per year account for 21 per cent of the city's population but only 6 per cent of COVID-19 cases. In contrast, those earning less than $30,000 per year account for 14 per cent of the population and 27 per cent of cases. Viewed from another perspective, those earning greater than $50,000 per year account for 70 per cent of the population and 47 per cent of COVID-19 cases while those earning less than $50,000 yearly account for 30 per cent of the population and 53 per cent of cases.

A preliminary analysis of this data shows that racialized communities are more likely to be overrepresented among COVID-19 cases relative to their share of the population. In the Greater Toronto Area, whites account for 48 per cent of the population and 17 per cent of COVID-19 cases [9]. This is in contrast to the situation with Black people who account for 9 per cent of the population and 21 per cent of cases. Indeed, in the City of Toronto, white and East Asians are the only groups where their share of the population exceeds their share of COVID-19 cases; persons who identify as Arab, Middle Eastern, South Asian, South-East Asians and Latin Americans, are also overrepresented among COVID-19 cases. Given the data from the U.S. and the UK, additional data relating to the Black population are warranted, particularly as this relates to the determination of risk factors for infection and adverse outcomes. In this context, while Black Canadians often reside in neighborhoods that are most severely affected by COVID-19, the extent of penetration of the infection into the Black population is unknown. Furthermore, granular details are missing to enable the identification of those at greatest risk within the community. Consequently, data are needed to determine the extent to which Black Canadians are infected with COVID-19 and the extent to which infection is likely to be associated with potential risk factors, including medical comorbidities, socioeconomic and demographic profiles.

What is the knowledge gap and what can we do to address this?

Risk factors for illness and severe outcomes among racialized communities are yet to be determined. It is appropriate to conduct a seroprevalence study to provide insights into the infection burden and provide an opportunity for an examination of the relationship between serologic evidence of infection and various clinical and socio-demographic data. This information would also provide some evidence of the potential herd immunity within the population. Herd immunity refers to the minimum proportion of immune individuals in a population that is needed to provide protection to interrupt the spread of viral infection. Estimates of the desired herd immunity for COVID-19 vary by country with 67 per cent in the U.S. and 56 per cent in Iceland [10].

A team led by Dr. Upton Allen plans to examine the prevalence of antibodies to SARS-CoV-2 among a population of Black Canadians within specific geographic postal code zones. Reference will be made to this work at specific points in this document. The team will collect clinical as well as socio-economic and demographic data that will allow us to examine the various factors that are most likely to be associated with infection within the study cohort. In large seroprevalence studies, it is possible to obtain data on several presumably at-risk groups, including Black Canadians. With 4.7 per cent of the population of Ontario identifying as Black Canadians [11], a study of 1000 subjects could potentially include only 47 Black Canadians. Such a number would not be adequate to provide meaningful results that allow for the examination of disease-related factors within the population. Thus, unless a concerted effort is made to enroll sufficient numbers of these individuals, the generalizability of study findings is compromised. We propose reaching out to these communities and engaging them in a manner that enhances participation. To this end, this study that targets Black Canadians is a first step toward engaging various ethnic groups. They were chosen as the first group to target due to signals that suggest increased risks of poor outcomes, coupled with great enthusiasm from community leaders to have this work done, thereby enhancing the chance of success.

How does one determine seroprevalence?

Seroprevalence relates to how common a particular infection is within a community as determined by measuring antibodies in the blood. This testing is referred to as serologic testing. There are different forms of serologic testing for SARS-CoV-2. One category of tests detect the presence of antibodies that indicate whether someone was infected with the virus. The second category of tests detect whether the antibodies that are present are able to "neutralize" the virus. They provide information on whether a person is likely to have immune protection from the virus. While there are several unanswered questions relating to how protective individuals with COVID-19 antibodies are from future episodes of COVID-19, it is likely that previous infection with the virus provides some protection from future episodes of COVID-19. Given that it is possible that these various antibodies could potentially wane over time, it is important to measure the evolution of changes over time to determine how long someone is likely to maintain protection from further episodes of COVID-19.

Serologic testing for SARS-CoV-2 continues to evolve. Early challenges included the potential for cross-reaction with antibodies to other coronavirus, including the seasonal coronaviruses mentioned above [12-17]. Because of this potential for cross reaction between SARS-CoV-2 and other human coronaviruses, extreme care needs to be taken when selecting an assay.

An alternative approach would be to use an assay that does not require a blood test (e.g., saliva). The use of saliva samples and other bodily fluids as a less invasive alternative may provide, as they have for other viral infections including HIV and measles, an alternative form of testing of SARS-CoV-2 infections [18-19]. However, in general they tend to be less sensitive. While such assays are being developed, it is unclear if they will be able to reliably detect SARS-CoV-2 antibodies at an appropriate level of sensitivity months after someone has recovered from COVID-19. Saliva antibody testing is different from saliva testing (as an alternative to nasal/nasopharyngeal swabs) for detecting active infection.

Community engagement

In order to conduct seroprevalence studies in the Black population, it is necessary to engage the community at an early stage. This is necessary for several reasons, including creating a trusting atmosphere that facilitates participation. Racialized community, including the Black population of North America, are very much aware of research studies that have been conducted in the past that took advantage of these populations resulting in ethical concerns. The communities are sensitized as a result of these studies and as such it is necessary to be very transparent with what is proposed, how the research will be conducted, what oversight mechanisms exist to monitor the project and how the results might benefit the community. With this in mind, we have established strategies to achieve these goals. First, the research will be led by members of the Black community who have credibility in academia and the community. Second, the research must undergo scrupulous ethics review at different levels. Third, a community advisory group should be established with representation from across the socioeconomic and demographic spectrum. Fourth, the establishment if a knowledge translation strategy as outlined below.

Risk factors for infection that potentially cross racial/ethnic lines

In the process of teasing out the risk factors of COVID-19 among Black Canadians, it is important to define the factors that cross race and ethno-cultural lines. It is possible that several groups share risk factors that are associated with health disparities. These include, but are not limited to poverty and its associated factors, living conditions and types of occupation. Some individuals live in crowded environments, sometimes in multi-generational settings where there is a high risk of secondary spread of infection to vulnerable persons within the home. In some communities, there is a high proportion of individuals in particular types of jobs that put them on the front line as this relates to potential exposure to COVID-19. An example are Personal Support Workers (PSWs). During the course of our work to date, we have found that there are some PSWs who work in multiple locations in order to earn enough to support their families. In addition, it is not unusual for individuals to have multiple different types of jobs.

In the above regard, it is appropriate to not only study Black Canadians, but to define specific postal codes zones where both Black as well as other Canadians can be evaluated This will allow for the groups to be compared in order to appreciate differences, while being able to identify risk factors that are common across the groups.

Risk factors of severe illness

A first step toward the determination of the risk factors that are associated with severe outcomes is the establishment of who is getting infected and why, as mentioned above. For example, how prevalent are potential markers of disease severity present among the population (asthma and other lung disorders, heart disorders, obesity, Sickle Cell Disease, among others)? While the full spectrum of clinical conditions that are associated with severe outcomes is yet to be determined, early on in the pandemic, the factors associated with severe influenza illness among adults and children served as a guide. Additional data would be required to tease out who among those with COVID-19 end up with worse outcomes. Thus, in addition to seroprevalence data, it would be appropriate to examine hospitalization and other data sources to get an appreciation of the markers of illness severity. For example, traditional markers of severity of respiratory infections include the need for hospitalization, length of hospital stay, admission to intensive care units (ICU), need for oxygen support and ventilation, duration of ICU stay and mortality.

Knowledge translation

If one identifies who is most at risk of COVID-19 illness and severe outcomes, what happens next? How does one ensure that the data generated are beneficial to the community studied and to society in general? Thus, knowledge translation (KT) is an important component of research. Simply put, the findings of research should not be locked away in an academic vault that is not accessible to the participants and the public. The old adage of "from the bench to the bedside and to the community" applies. It is important for the research findings to be translated in a manner that can be shared with the community, taking into account heterogeneity within the community as this relates to sex, gender, language, age and other variables. In order to assist with this task, it is now expected that research teams collaborate with groups that have special expertise in KT. Furthermore, it is essential that the process of preparing for adequate KT starts early. To this end, in our own research we have engaged a KT group to assist us with a KT strategy at an early stage.

Data monitoring review with community input

In our own research, we have identified that a data monitoring and review framework with community input is an important component of the research. It is not uncommon for communities participating in research to ask if they can see the data at selected periods before they are released to others external to the communities. The process of data review could be coordinated with knowledge translation; however, from a practical perspective, the review group would be a smaller number of individuals representing the community. The latter brings into focus how best to determine the person(s) to best represent a particular racialized community.

Coping with misconceptions

During the course of our work so far, we have identified the need to address several misconceptions. These misconceptions are not confined to any one racial, ethnic or socioeconomic group and often relate to the origins of the virus that causes COVID-19, the relative susceptibility of different ethnic groups, the modes of acquisition and transmission of COVID-19, the role of home remedies and the most appropriate treatment and prevention strategies. While further work is needed to determine the basis and origins of misconceptions, it is important for COVID-19-related public health information to take into account misconceptions, and be messaged and delivered in a manner that is appropriately targeted to the population. An important misconception relates to the role of potential vaccines against COVID-19. The timely arrival of deployable vaccines is essential, given the global impact of COVID-19. Achieving an appropriate level of herd immunity is of paramount importance. Current estimates suggest that the level of herd immunity that is needed to interrupt the sustained transmission of SARS-CoV-2 is at least 65 per cent. Data from the U.S. indicate that during the first wave of COVID-19 less than 10 per cent of the population developed antibodies against SARS-CoV-2 [20]. In Canada, a blood donor survey suggested that less than 1 per cent of individuals developed antibodies against SARS-CoV-2 [21]. This would suggest that there is a long road to travel on the way to herd immunity from natural infection. However, it must be appreciated that the blood donor pool of individuals might not be representative of all population groups in Canada, including those residing in areas most affected by COVID-19. It is not likely that an appropriate level of herd immunity would be achieved without a vaccine that can be deployed in a timely manner. This would suggest that vaccines will likely play an important part in controlling infection in this pandemic. With this in mind, it is important to have in place a plan that allows for the fair allocation of vaccines to those choosing to be vaccinated.

Fairness in vaccine allocation and program implementation will be important principles that will guide the deployment of COVID-19 vaccines. It would seem reasonable that individuals from populations at the highest risk of severe outcomes should be given priority for vaccination. There are also compelling reasons to prioritize the vaccinations of others who are in essential services or who reside in homes with highly vulnerable individuals, for example. Misconceptions have resulted in confusion regarding why some groups have been mentioned as among those who may be given priority for vaccination. This has to be communicated in an appropriate and transparent manner so as not to create the impression that certain groups are being targeted as "testers" of the vaccines to see if they work before others are vaccinated. This underscores the importance of ensuring that the candidate vaccines are adequately studied in a careful and systematic manner and do not appear to be rushed. In this manner, when the vaccines are ready, an appropriate system of fair allocation can be developed to minimize misconceptions.

Due to these misconceptions as well as inconsistencies in scientific messaging, coupled with arguably some lack of transparency, it cannot be assumed that some groups would accept COVID-19 vaccines if they were available today and they were given priority for vaccination. For example, a PEW Research Center survey in the U.S. showed that among Americans, 44 per cent of Black people and 25 per cent of whites would not accept the vaccine if it were available [22]. Acceptance rates were also lower among some religious groups studied. Conspiracy theories abound as circulated through various forms of social media. Research to determine the reasons for these relatively high rates of vaccine non-acceptance needs to be given priority. Transparency in communicating the vaccine development process will go a long way in enhancing public confidence and vaccine acceptance. Non-traditional means of communicating the outcomes of safety and efficacy trials are important so that the public can be fully engaged in knowledge acquisition. Simply put, uniformly high rates of acceptance of a COVID-19 vaccine cannot be assumed across population groups, including those at high risk of severe outcomes from COVID-19.

Summary

In summary, data are warranted to determine the extent to which the Black community has been infected with SARS-CoV-2 and the granular list of risk factors associated with infection and poor outcomes. In the pursuit of these data, active community engagement is important, coupled with an appropriate knowledge translation process.

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