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Brief Report

Outbreak investigation of COVID-19 in hospital food service workers

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An outbreak of 10 COVID-19 cases among food and nutrition department employees occurred before the institution implemented universal masking and physical spacing between staff as part of an overall COVID-19 pandemic response. The outbreak highlighted the importance of early recognition of potential occupational exposure risks, prompt outbreak investigation and implementation of engineering and administrative safety controls. It also served as an opportunity for different departments within the institution to collaborate to prevent future outbreaks.

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BACKGROUND

SARS-CoV-2, the virus that causes COVID-19, is primarily spread person-to-person via contact with infected respiratory droplets.¹ It is estimated that an individual may be infectious prior to becoming symptomatic.² Areas with crowded work spaces and poor ventilation may be associated with higher transmission.³

An employee in our academic medical center's food and nutrition department was tested for COVID-19 at an employee testing center. At the time of testing, the employee endorsed cough, runny nose and body aches. When the result returned positive, the initial investigation revealed this individual worked several days while symptomatic and may have exposed many others.

METHODS

A formal outbreak investigation commenced in the setting of 1 confirmed case and recognition of occupational exposure risks to others. The formal investigation included contact tracing, education of employees on infection control measures and safe practices (eg, not coming to work ill), implementing control measures, employee screening (temperature checks, symptom screen, and asymptomatic COVID-19 testing), communication of key findings and maintaining the surveillance system.

Nasopharyngeal swab specimens in viral transport media were used for SARS-CoV-2 PCR testing following the Centers for Disease Control and Prevention (CDC) published protocol.⁴ The viral RNA was extracted according to manufacture protocol using Quick SARS-CoV-2 Viral 96 Kit (Zymo Research Corp, Irvine, CA). CDC approved PCR primers were used, including SARS-CoV-2 primers (N1 and N2) and human RNase P (Integrated DNA Technologies, San Diego, CA). Rt-PCR was performed using QuantStudio-5 Real Time PCR instrument (Thermo Fisher, Waltham, MA). If both N1 and N2 were positive, the test result was reported as positive.

Asymptomatic testing of 280 staff was pursued to provide a more complete estimate of the incidence of disease, the extent of the outbreak, and to evaluate the impact of mitigation measures put in place. The recommended cadence for asymptomatic testing of staff was at the start of the investigation (round 1), 3–4 days later (round 2), and at the conclusion of the incubation period (14 days from potential exposure to a known case, round 3).

RESULTS

Ten staff members from the food and nutrition department were positive for SARS-CoV-2 during this investigation. There were no patients associated with this outbreak.

Eight staff members were classified as close contacts of the index case and were contacted with instructions to self-monitor for symptoms for 14 days, guided by a symptom monitoring tool, to get tested at the employee testing center should they develop symptoms, and reminded not to work when ill. None of these 8 individuals became ill. Over the following 14 days, 53 employees became symptomatic and were tested; 7 of those had positive COVID-19 results. Sixty percent of the cases were female with an average age of 48 years.

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Conflicts of interest: None to report.

Table 1
Descriptive epidemiology of cases

Role	Sex	Age (years)	Date of symptom onset	Date of positive test	Day(s) worked	Other exposure risks
Room service ambassador	M	56	3/15/20	3/26/20	3/19, 20, 23, 24	None identified
Food service worker	F	47	3/28/20	3/30/20	3/28	Symptomatic family member
Cashier	F	45	3/28/20	3/30/20	3/30	Symptomatic family member; also employed at another health care facility
Food service worker	M	24	3/28/20	3/30/20	3/28–30	None identified
Cook	M	40	3/30/20	4/2/20	3/28–29	None identified
Food service worker	F	76	4/3/20	4/5/20	4/3	None identified
Food service worker	M	25	4/3/20	4/5/20	4/3	None identified
Food service worker	F	46	4/6/20	4/6/20	4/5	None identified
Cook	F	44	Asymptomatic	4/11/20	4/10	None identified
Food service worker	F	35	Asymptomatic	4/13/20	4/13	None identified

A total of 640 tests were performed in asymptomatic staff. Thirty-two staff members completed 1 round of testing, 52 staff completed 2 rounds of testing and 168 staff completed all 3 rounds of recommended testing. There were 2 staff members who resulted positive during this asymptomatic testing process. Table 1 details the 10 symptomatic and asymptomatic cases in this investigation.

DISCUSSION

It was learned that staff in the food and nutrition department share a common locker room and break area, so individuals whose duties do not place them near each other during their shift often socialize and intermingle at change of shift and break times. For this reason, the decision was made early in the investigation to not administer an outbreak survey to identify specific risk factors and instead consider all staff actively working (eg, not on protected leave) in this department to be exposed.

In addition to providing in-person and printed education content to food and nutrition department staff, daily touch base meetings were held with the relevant leadership teams to discuss new developments in the investigation, and new engineering and administrative controls were implemented. The early in-person education sessions at shift huddles likely helped reduce transmission. Two of the cases had mild symptoms and decided to get tested after learning that many people with COVID-19 have mild symptoms and can transmit the virus to others with or without symptoms. All staff with a positive result were required to remain at home for 7 days and until they were symptom-free for 72 hours. Plastic partitions were installed at cashier stations to serve as a barrier between customers and cashiers. Work schedules for food preparation were staggered as much as possible and still meet the needs of the organization. Hanging plastic barriers were installed in the food preparation areas between work stations where ensuring 6 feet of separation between individuals was not feasible. Food and nutrition staff implemented

universal masking while on duty before the organization made this a requirement for all staff.

CONCLUSION

The index case in this COVID-19 outbreak among hospital food and nutrition staff worked 4 shifts with mild respiratory symptoms before seeking evaluation and treatment. Seven additional staff in this department became symptomatic and tested positive for COVID-19. Two additional cases were found from serial asymptomatic testing of all department staff. It appears the index case may have transmitted the virus to the 7 individuals who became symptomatic, and the 2 asymptomatic cases are either from this point source, as a result of person-to-person transmission, or were exposed outside of the work unit. The outbreak was halted when infection control measures and safe practices were reinforced with staff, symptom monitoring including temperature checks were implemented prior to start of each shift, asymptomatic testing was performed for enhanced case finding, all positive staff were isolated at home, physical barriers were installed, and physical distancing and universal masking were observed.

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