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Letter to the Editor

Proactive screening approach for SARS-CoV-2 among healthcare workers

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ARTICLE INFO

Article history:

Received 9 July 2020

Received in revised form

6 August 2020

Accepted 9 August 2020

Available online 18 August 2020

Editor: L. Leibovici

To the Editor

As of July 8, 2020, Israel has experienced 32 714 cases of coronavirus disease (COVID-19) (3557 cases/million) and 343 deaths (37 deaths/million) [1]. Most patients have mild symptoms, and at least 30% are asymptomatic [2]. Healthcare workers (HCWs) are standing in the front line of this pandemic, and the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) has infected many HCWs worldwide. There are international and local guidelines to prevent infection of HCWs by using suitable personal protective equipment (PPE). Although the correct use of PPE theoretically prevents infection of HCWs, there still is considerable anxiety and fear amongst many [3]. In order to create a safe hospital environment for staff members and patients, the hospital management established a novel proactive periodic screening programme for SARS-CoV-2 for all personnel. Here we present the first 2 months of this programme.

The Hadassah Hebrew University Medical Centre in Jerusalem consists of two hospitals with 1100 inpatient beds; it employs about 6680 personnel. Jerusalem is one of the areas with the highest prevalence of COVID-19 in Israel. Preparations in the hospital included building five dedicated wards for COVID-19 patients, including 44 intensive care beds, and establishing guidelines for the

use of PPE in the different settings. Since the end of March, all hospital staff and visitors were required to wear a surgical facemask at all times.

The proactive screening procedure, starting March 22, involved summoning staff members by text messages for nasopharyngeal swabbing for SARS-CoV-2 PCR. We started with critical teams and later on proceeded to all other HCWs. The specimens were processed and analysed using a fluorescent RT-PCR kit, with primers and probe targeted to the SARS-CoV-2 ORF1ab gene (BGI) in pools [4]. All tested HCWs were summoned for a second screening test after 5 days. HCWs with a high exposure risk (e.g. working in a COVID-19 ward) were asked to periodically repeat screening. An automatic report of all staff members tested was generated twice daily. HCWs were required to adhere to social distancing also outside the hospital.

The infection prevention team excluded from work every worker found positive, and initiated an immediate epidemiological investigation in a search for contacts. Personnel exposed to a positive HCW were sent for isolation according to Centers for Disease Control and Prevention (CDC) guidelines.

Between March 22 and May 11, 2020, the lab performed 10 131 PCR tests on hospital personnel (14.7% of all tests). Overall, 4897 out of 6680 employees were tested (73%). Of these, 1428 (29.1%) were screened once, 2463 (50.3%) twice and 1006 (20.5%) three or more times. The number and proportion of staff members tested are presented in Table 1.

Forty-three employees (0.9%) had a positive PCR; 28 of the 43 (65%) were detected in the proactive screening. In only 5/43 (11.6%) was there a suspicion for in-hospital acquisition (either proven unprotected contact with a positive patient or working in a dedicated COVID-19 ward). Thirty-eight of these 43 HCWs (88%) had some symptoms attributed to COVID-19 infection (58% fever, 39% cough, 14% sore throat, 33% loss of taste and/or smell). Most symptomatic HCWs had mild symptoms and none needed respiratory support. Only 5/43 (11.6%) were asymptomatic at the time of diagnosis. The asymptomatic positivity rate was 5/4897 (0.10%).

Our novel screening approach is not routine in other outbreaks, such as influenza pandemics. In a relatively short period, we screened 74% of physicians and 85% of nurses; 70% of them were

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Table 1
Number and proportion of staff members tested in every sector

Sector:	Total n (%)	Screened	Positive	Asymptomatic
Medical	2211 (33)	1629 (73.7)	9 (0.6)	1 (0.06)
Nursing	2470 (37)	2098 (84.9)	25 (1.2)	2 (0.09)
Paramedical ^a	574 (9)	322 (56.1)	2 (0.6)	0 (0.00)
Administrative	1425 (21)	848 (59.5)	7 (0.8)	2 (0.23)
Total	6680 (100)	4897 (73.3%)	43 (0.9)	5 (0.10)

^a Paramedical = medical professions except physicians and nurses.

screened twice or more. This approach allowed early identification and isolation of asymptomatic and mildly symptomatic HCWs, who probably otherwise would not have been tested. This screening approach enabled us to establish a safer hospital environment by lowering cross-transmission between HCWs, thus ensuring the optimal functioning of the hospital during the crisis. Additionally, it contributed to the sense of security of the staff, and allowed staff members to focus on their tasks with minimal concern about being infected from a colleague [5].

This approach has some limitations. First, execution of such a programme requires a large laboratory capability that is not available at every institution. However, it may be applied selectively to high-risk departments. Second, PCR-based screening results are valid only for the day of the test, which may cause a false sense of confidence. In order to overcome this, we repeated the screening after 5 days, and HCWs were obliged to maximize social distancing. One might ask whether the positivity rate of only one asymptomatic HCW per 1000 tests justifies such a vast intervention; however, the additional benefit of staff confidence is of substantial value. Moreover, we also diagnosed several HCWs with minor symptoms who probably would not have been tested without our programme.

In summary, we applied a unique personnel-screening approach during the pandemic, which we continue beyond the presented period to the current time. This allows early identification of SARS-CoV-2-positive HCWs and assists in the smooth functioning of the hospital during this outbreak.

Author contributions

All authors have made substantial contributions to this work and have approved the final manuscript. Concept and supervision: ZR and SB. Acquisition, analysis, and interpretation of data: YO, DGW, KOP, CS and SB. Writing of the original draft: YO, CS and SB.

Transparency declaration

All authors report no conflicts of interest relevant to this article. No financial support was received.

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