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Efficiency of National Taskforce for Combating the Coronavirus (COVID-19) Protocol using real-time PCR testing in health facilities over a period of 8-weeks

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A B S T R A C T
Background: Following declaration of Corona Virus Disease 19 (COVID-19) as a global outbreak by the WHO with recommendation to do nasopharyngeal swabs for diagnosis. Many countries started to take different measures of precautions. The Kingdom of Bahrain COVID team (National Taskforce for Combating the Coronavirus) has introduced different protocols for different categories.
Objective: The aim of this study is to; determine the efficiency of the recent National Taskforce for Combating the Coronavirus (COVID-19) Protocol 3-day nasopharyngeal swab from diagnosis; by evaluating the period of time needed for a patient to retain a negative polymerase chain reaction result and to determine the number of patients who failed to retain a negative result. In addition to, evaluating the cycle threshold values of persistent positive and its relation to current evidence in literature. This study also aims to determine the number of patients that needed urgent medical care [i.e. shifting to an intensive care unit (ICU) facility] in that time frame.
Materials & methods: Data were collected from the daily index master sheets present in the facility from medical database systems; ALCARE by Royal Medical Services and ORACLE Reports by iSEHA. Search engines used were PubMed/MEDLINE, Oxford Academic Database, Cochrane Database system. The duration of study was from 1-July 2020 to 31-August 2020.
Results: The sample included 7196 male patients from ages 18–65 years. Median age was 36. Out of 7196 patients, 3506 retained a negative result on 5th day from diagnosis, 1594 retained a negative result on 7th day from diagnosis, and 1343 retained negative result on 9th day from diagnosis. While 618 patients failed to retain a negative result.
Conclusion: This study estimated the efficiency of testing protocol based on the current prevalence state of COVID-19. They found that the current protocol was not enough for the clinical data. In addition, 7-day nasopharyngeal swab was an effective testing method. Among the patients with Ct value >24, negative infected persons should be paid close attention.

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Introduction

The World Health Organization (WHO), has declared the outbreak of COVID-19 being a Public Health Emergency of International Concern on 30th January 2020. The disease poses a high risk to countries with defenseless health scheme. The main objective stood to reduce the monetary influence of the disease and stand deception on a worldwide measure. The disease spread could be prevented by early recognition, isolation, contact tracing, and quarantine. WHO emergency committee suggested that observing deviations of seroprevalence over time is fundamental to detect its dynamics and plan a satisfactory response [1,2]. The disease has arisen very rapidly in the past few months, puzzling the old-fashioned clinical systems in health comeback [3]. The disease was first abbreviated as 2019-nCoV by the WHO and was later named...
coronavirus disease 2019 (COVID-19), where it was found to be moderately infectious with a high death rate, relatively [4]. Nasopharyngeal swab has been deemed to be superior to nasal or oropharyngeal swabs in detecting the Sars-Cov-2. The U.S CDC has recommended the use of nasopharyngeal swab over the oropharyngeal swabs due to its higher sensitivity. The lab test uses a reverse transcriptase-polymerase chain reaction (RT-PCR) to identify viral ribonucleic acid (RNA); Zitek et al., has proposed that the RT-PCR is highly specific for Sars-Cov-2, as it does not detect other common viruses’ nucleic acids [5]. The aim of this study is to; determine the efficiency of the recent proposed National Taskforce for Combating the Coronavirus (COVID-19) Protocol for 5-day nasopharyngeal swab from diagnosis in health facilities for mildly symptomatic or asymptomatic individuals. It also aims to evaluate the period of time needed for a patient to retain a negative RT-PCR result. The study also aims in evaluating cycle thresholds (Ct) of patients who failed to retain a negative result up to 10 days.

Cost analysis

The total cost of a nasopharyngeal swab for RT-PCR test processing [including equipment] was approximately calculated approximately $28,457 per person. A total cost over 8-weeks period was calculated to be approximately $194,335.9 for patients that had swabs on day-5, and day-7 (including the day-5 swab). Another estimate was done for patients who retained a negative on day 9 (including day 5 & 7 swabs) equals $114,655.05 with a total of $308,990.97 as a sum.

Considering, if the swabs collected were to be only at day-7, a total was estimated of $204,779.787 with $104,211.17 savings.

Materials & methods

The data was collected from our master sheet index daily records of patients based on the National Taskforce for Combating the Coronavirus (COVID-19) Discharge Protocol in health quarantine facilities [Fig. 1]. The search engines used were PUBMED/Medline, Cochrane database, and Oxford Academic database with keywords used were ‘COVID-19’, ‘Quarantine’, ‘Nasopharyngeal’, ‘Protocol’, and ‘RT-PCR’. All data were collected from medical database systems; ALCARE by Royal Medical Services and ORACLE Reports by iSEHA in correlation to our master sheet index. Patients inclusion criteria in our study involved; patients who were asymptomatic or with mild symptoms in relation to Sars-Cov-2. Patients who are otherwise healthy diagnosed with COVID-19 and also patients who remained with positive results on real time PCR test. The exclusion criteria involved; 72 patients who were a candidate for home isolation or other facilities; 32 candidates that were transferred to the Field Intensive Care Unit (FICU); candidates that had chronic medical illnesses; and patients that entered the facility with a negative PCR result for quarantine purposes. The study was conducted over period of 8-weeks from 2nd of July to the 26th of August. The patient sample collected were of male gender with ages above 18 and below 65 years of age due to rules and regulations of the facility (to only admit male patients).

An overview summary of the work nature in Sitra Health Quarantine Facility, Kingdom of Bahrain.

What is Sitra Health Quarantine Facility?

The Bahrain Defence Force – Royal Medical Services (BDF-RMS) is one of the major health establishments and the only military medical facility present in Kingdom of Bahrain. It has established two quarantine facilities following the declaration of WHO on coronavirus being a global pandemic, playing an active major role in the National Taskforce for Combating the Coronavirus (COVID-19). Two locations were placed for quarantine facilities, Sitra and Al-Hidd region.

Sitra Health Quarantine Facility is the largest quarantine facility established in the Kingdom of Bahrain by using the military background and leadership skills in disaster management. It was established in a very short-time period with a holding capacity of 3000+ beds. The accommodation was divided into 4 zone areas (zone 1 – 4), each with its own facilities. One of which is allocated for quarantine patients and the remaining 3 are for patients diagnosed with COVID-19. Multiple clinics are distributed all over the campus with 2 on-call doctors covering a 12-h shift daily where proper equal medical care is provided to all patients. The facility is also established with a Field Intensive Care Unit (FICU) with a capacity of 154 beds fully equipped with ICU necessities, medical personnel’s, and all required infrastructure of an ICU establishment.

Mechanism of work

All patients found to be positive on real time PCR test/Gene Xpert, are contacted by the National Public Health for assessment and isolation plan. Upon arrival to the Sitra Health Quarantine facility, the patient is assessed and admitted in the field facility, tent or cabin.

Daily admission list is sent to the swab team in the facility and is added to their master sheet index. A daily swab list is formulated based on National Taskforce for Combating the Coronavirus (COVID-19) Protocol and is distributed to patients 1-day prior to swab collection. All nasopharyngeal swabs are collected during morning hours by the facility’s medical professionals and volunteers. The samples then undergo a process of dispatching prior to being delivered to the lab for further processing. All results are then traced and updated on the master sheet index with a further plan.

Route to discharge as per National Taskforce for Combating the Coronavirus (COVID-19)

All patients with a negative result are discharged with the condition of completing 10 days as a total from the onset of symptoms in home isolation. Otherwise, if tested positive, he would enter into a loop of being tested next from 2 to 5 days until he retains a negative result. Failure to retain a negative result within 10 days, allows the patient to be eligible for discharge only if asymptomatic in the last 72 h or has mild upper respiratory tract infection symptoms (URTII), then patient needs to complete 7 days in home isolation.
Other routes of discharge/transfer-outs

Any patient with worsening respiratory symptoms is fully assessed and managed initially. An action plan is placed based on COVID-19 Pneumonia Allocation Guided by Clinical Severity Protocol is followed to transfer the patient to a more advanced medical facility (e.g. Field-ICU or other medical units).

Other asymptomatic patients may also be transferred out from our facility upon their request once they meet the home isolation criteria where they need to be assessed in a healthcare unit prior to taking the final decision.

Results

The sample of patients collected were of male gender following guidelines of the facility with ages ranging from 18 to 65 years. The median age is 36 years. Following applying the exclusion criteria, a total of 7196 male patients were included in the study. Out of 7196 patients, 3506 patients retained a negative result after 5 days from diagnosis (48.72%), 1594 patients retained a negative result at 7 days from diagnosis (22.15%), 1343 patients retained a negative result after 9 days from diagnosis (18.66%), and 618 patients failed to retain a negative result even after 10 days from diagnosis and were discharged on that basis (8.5%). The least of which 135 patients retained a negative result 6 days from diagnosis (1.876%) and that is due to admission errors [Figs. 2 and 3]. Combining the results of Day 5 and Day 7 of swab taking equals a 72.7%.

From the 7196 patients, 618 (8.5%) were extracted as persistent positive to evaluate their Ct values. The results were taken from diagnosis date, 5th, 7th, and 9th testing days. On the day of diagnosis, an average of 24.24 Ct value was calculated with lowest number being 14.64 and highest 35. On Day 5 tests, the average Ct value was 27.34 with lowest value interpreted to be 17.07 and highest 35.98. Day 7 tests revealed an average Ct value of 29.55 with lowest value interpreted was 19.76 and highest 37.66. The last test on Day 9 revealed an average of 30.89 Ct value with lowest number interpreted 20.28 and highest 37.93. All numerical values have been expressed in a bar graph in 2 decimal points [Fig. 5].

349 out 618 had Ct values ranging between 24 and 35 on diagnosis (56.4%). On Day 5, 505 out 618 (81.7%) had obtained Ct values ranging between 24 and 35. On Day 7, 582 out 618 (94.1%) had obtained Ct values ranging between 24 and 35. On Day 9, 599 out 618 (96.9%) had obtained Ct values ranging between 24 and 35.

Discussion

Isolation

Self-isolation of infected patients is recommended as a primary measure [4]. Zitek et al. [5], stated that patients with mild symptoms need not to present to emergency facilities nor get tested for COVID-19 and only recommends self-isolation. Also, stated that a negative result does not rule out the disease [5]. A Cochrane database systematic review has involved multiple studies related to quarantine and found that 50% reduction in confirmed cases was only achieved by isolation and quarantine [14]. Our study strongly agrees to self-isolation of patients with a confirmed diagnosis to Sars-CoV-2. The process of self-isolation guidelines placed by the Kingdom of Bahrain health authorities was applied to enhance social distancing, contact tracing, isolation and quarantine to reduce the impact of the disease. Many patients were quarantined away from their homes to prevent any further spread of the COVID-19. Testing recommendations were placed for all types of symptoms regardless of severity. In the study, we found that 1 in every 226 patients (0.44%) of all asymptomatic to mild symptoms patients will need an intensive care referral due to worsening of respiratory symptoms.

Testing with RT-PCR

A study conducted in London on 200 healthcare workers of frontline exposure has found 87 (44%) serologic or RT-PCR to be positive to Sars-CoV-2. In the study, a mean duration of 12.9 days (first positive to last positive swab) with the longest duration seen to be up to 29 days from diagnosis. Out of the 87 HCW, 42 were tested positive by the RT-PCR where they were surveyed over 7 days. 20 (48%) out 42 returned with symptoms within 7 days, 16 (38%) were asymptomatic within that time setting, and 6 did not return with any survey answers [8]. In our study, from the 618 patients that failed to retain a negative result were found to have persistence of the virus for more than 10 days. A study conducted in Paris, France, involved 44 patients that were tested for Sars-CoV-2 to test convenience of nasopharyngeal swabs. 37 (84.1%) out 44 patients were confirmed to be diagnosed with Sars-CoV-2 with RT-PCR testing. 33 out of the 37 also tested positive on nasal sampling [9]. Nasopharyng-
geal swabs are still the most superior test recommended in many studies and is still used by the Kingdom of Bahrain.

A study conducted by Jehi et al. [11], stated that only patients who were at higher-risk should be tested, and those were patients who had multiple co-morbidities such as; age >60 and <3.5; patients on immuno therapy or who are immunocompromised; as well as patients who went in contact with a known COVID-19 case [11]. Another study by Hanson, Kimberley et al. [15], stated recommendations for whom should be tested. The study stated that symptomatic patients with low suspicion should be tested and that over-diagnosis was a harmful consequence. Testing asymptomatic individuals who have been or suspected to be exposed to infected individuals has been proven to have more benefits over risks due to the ability of confining the disease and promote isolation [15]. Jae-Sun et al. [21], stated that asymptomatic patients had shorter time to negative conversion compared to symptomatic individuals and that is due to either delayed diagnosis or short disease duration [21]. Our country still supports testing of cluster shelters, and random screening of individuals with unknown history to exposure. In our study, the numbers of patients who were discharged on day 5 not necessarily be noted as asymptomatic patients. It could be mainly due to random screening and late diagnosis. Yet, isolation is still recommended by our national taskforce to prevent the spread of the disease. Over diagnosis, can and might cause a percentage of negligence in patients who think they have cultivated the virus, where they may think that personal protective measures are not needed anymore.

**Cycle threshold (Ct)**

A study by Bullard et al. [6], analyzed a total of 90 samples and positively developed Sars-CoV-2 from 26 samples out of 90 (28.9%). From that sample the positive cultures were present only until day 8 from onset of symptoms. The study also stated that with every unit cycle-threshold (Ct) value increase the odds for a positive culture decreased by 32%. Also stated that with every one-day increase in symptom to test (STT) the positive culture decreased by 37%. The percentage of obtaining a positive viral culture was at its highest on day 3 and declined from that day. Isolation was recommended to patients diagnosed with COVID-19 to be at least 10 days or 72 h free of symptoms [6,20]. Following extraction of 618 patients, Ct values interpreted that most of the patients had low viral loads leading to decreased infectivity. Studies suggested above are strongly agreed upon that patients with Ct value >24 have lower risk in disease transmission. Mostly, our patients were pre-symptomatic or even asymptomatic at arrival to the facility. The numbers in our study strongly correlates with numbers observed in Ref. [6]. The extraction revealed that most of patients tested had Ct values >24 and <38. The patients who were discharged upon that were assessed as to being clear of symptoms for at least 72 h, as well.

An estimation of the potential of transmission of the disease has been found to be 96.9% within the first 7 days from day of onset of symptoms. Viral loads peaked by 2 or 3 days from symptom of onset and decreased greatly after that [18]. A study in Washington, conducted in March, stated that testing of pre-symptomatic patients was 3 days. A range from 18.6 to 29.2 Ct values was found to be a result for patients with typical symptoms, 24.3–26.3 for patients with atypical symptoms, 15.3–37.9 for patients who were pre-symptomatic, and 21.9–31 Ct values were for patients who were asymptomatic [16]. Our recommendations propose that a nasopharyngeal swab need to be repeated after 7 days from diagnosis. Given with the fact that our numbers propose a 48% discharge on day 5 from diagnosis. 22% of our patients were exposed to multiple swabs (Day of diagnosis, Day 5, Day 7) until they obtained a negative conversion.

**Incubation period**

Sjödin et al. [10], stated that the incubation period of the disease was found to be 5 days and 10 days for asymptomatic patients. Also suggested that a pre-symptomatic period of infectiousness was of 1 day [10]. Risk assessment must be done carefully, with HCW being at higher risk even without symptoms or identified contacts [12]. Another study was conducted on Singapore and Tianjin (Northeast-
ern aspect of China) stated that an incubation period in Singapore equaled mean interval of 4.17 days and 4.31 in Tianjin [13]. The incubation period for early transmission dynamics was found to be 5.2 days [17]. Studies above suggest the emphasis of incubation periods and who are at higher-risk of exposure to be tested. Showing that multiple origins resulted from 4.17 to 5.2 days of incubation period suggests that tests need not to be done at 5 days from diagnosis and yet to be assessed on the 7th day from confirmation.

To the knowledge of authors, Kingdom of Bahrain, has been the first to propose a protocol for testing from diagnosis. The National Taskforce for Combating the Coronavirus (COVID-19) Protocol for testing has been placed based on studies above. Nevertheless, Bahrain has been one of most countries to be still combattting COVID-19 through quarantine and self-isolation. The Kingdom still is one of most countries that randomly screens house-hold shelters with asymptomatic patients, tests contacts of a COVID-19 confirmed case and individuals arriving from overseas.

Our study has limitations and they are, 1- patients present in the quarantine were of only the male gender. 2- More studies needed from other countries to be conducted for quarantine facilities. 3- A limited age range of adult patients, and does not include children.

Conclusion

The authors conclude that medical quarantine facilities are important as in every 226 patients admitted in the facility, 1 patient will get a rapid medical care for worsening respiratory symptoms. The best method testing should be done after 7 days from onset of symptoms or diagnosis with a 72.7% probability of retaining a negative result and also concludes that any positive RT-PCR result with Ct value >24 is deemed non-infective [Figs. 4 and 5]. This study intended to modify the National Taskforce for Combating the Coronavirus (COVID-19) Discharge Protocol for mildly symptomatic or asymptomatic patients in health facilities confirmed with COVID-19. If a patient retains a negative result, the patient can be discharged on that basis with additional home isolation instructions. If a patient retains a positive RT-PCR result on day 7 with a Ct value >24, then the patient can be kept for 3 more days’ isolation until he/she completes a total of 10 days isolation in the facility followed by 7 days home isolation with precautions. An estimate saving of 8-weeks swabs cost a minimum of $104,211.17 savings for quarantine facilities and medical resources. More studies need to be conducted on cost analysis and follow-up on persistent positive patients.

Author contributions

Maximum contribution towards the conception, design, analysis of data and drafting of this manuscript is attributed to the first authors, Dr. Fahad Al Qooz and Dr. Khalid Behzad. All other authors share equal effort contribution towards (1) substantial contributions to conception and design, acquisition, analysis and interpretation of data; (2) drafting the article and revising it critically for important intellectual content; and (3) final approval of the manuscript version to be published.

Ethics

This research has been approved by the Bahrain COVID-19 Research & Ethics Committee and has been approved by the Ethical & Research Committee in Bahrain Defence Force Hospital.

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Conflict of interest

The authors have no conflicts of interest to declare.

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References

[1] Sohrabi C, Alsafi Z, O’Neill N, Khan M, Kerwan A, Al-Jabir A, et al. World Health Organization declares global emergency: a review of the 2019 novel coronavirus (COVID-19). Int J Surg 2020;76:71–6.
[2] Stringhini S, Winnik A, Piumatti G, Azman A, Lauer S, Bayssos H, et al. Seroprevalence of anti-SARS-CoV-2 IgG antibodies in Geneva, Switzerland (SEROCoV-Pop): a population-based study. Lancet 2020;396:313–9.
[3] Siegle A, Sullivan P, Sanchez T, Lopman B, Fahnint M, Sailey C, et al. Protocol for a national probability survey using home specimen collection methods to assess prevalence and incidence of SARS-CoV-2 infection and antibody response. Ann Epidemiol 2020;49:50–60.
[4] Harapan H, Ithoh N, Yufika A, Winardi W, Keams S, Te H, et al. Coronavirus disease 2019 (COVID-19): a literature review. J Infect Public Health 2020;13:667–73.
[5] Zitek T. The appropriate use of testing for COVID-19. West J Emerg Med 2020;21(3):470–2.
[6] Bullard J, Dust K, Funk D, Strong J, Alexander D, Garnett L, et al. Predicting infectious SARS-CoV-2 from diagnostic samples. Clin Infect Dis 2020.
[7] Nhra.bh. 2020. [online] Available at: https://www.nhra.bh/Media/Announcement/MediaHandler/GenericHandler/documents/Announcements/NHRA_News_MOH%20ALERT%20Bahrain%20COVID%2019%20National%20Protocol%2020200701.pdf [Accessed 25 August 2020].
[8] Houlihan C, Vora N, Byrne T, Lewater D, Kelly G, Heaney J, et al. Pandemic peak SARS-CoV-2 infection and seroconversion rates in London frontline health-care workers. Lancet 2020;396:66–7.
[9] Pérez H, Podglajen I, Wack M, Flamaron E, Miraiti T, Goudot G, et al. Nasal swab sampling for SARS-CoV-2: a convenient alternative in times of nosopharyngeal swab shortage. J Clin Microbiol 2020;58(6):e00721–20.
[10] Sjödin H, Wilder-Smith A, Osman S, Farooq Z, Rocklov J. Only strict quarantine measures can curb the coronavirus disease (COVID-19) outbreak in Italy, 2020. Euro Surveill 2020;25(13), pii=2000236.
[11] Jehi L, Ji X, Milimovich A, Errazuriz S, Rubin B, Gordon S, et al. Individualizing risk prediction for positive coronavirus disease 2019 testing: results from 11,672 patients. Chest 2020.
[12] West C, Montori V, Sampathkumar P. COVID-19 testing: the threat of false-negative results. Mayo Clinic 2020;95(6):1127–9.

[13] Tindale L, Stockdale J, Coombe M, Garlock E, Venus Lau W, Saraswat M, et al. Evidence for transmission of COVID-19 prior to symptom onset. eLife 2020;9:e57149.

[14] Nussbaumer-Streit B, Mayr V, Dobrescu A, Chapman A, Persad E, Klerings I, et al. Quarantine alone or in combination with other public health measures to control COVID-19: a rapid review. Cochrane Database Syst Rev 2020;4(4):CD013574.

[15] Hanson K, Caliendo A, Arias C, Englund J, Lee M, Loeb M, et al. Infectious diseases society of america guidelines on the diagnosis of COVID-19. Clin Infect Dis 2020;ciaa760.

[16] Kimball A, Hartfield K, Arons M, James A, Taylor J, Spicer K, et al. Asymptomatic and presymptomatic SARS-CoV-2 infections in residents of a long-term care skilled nursing facility — King County, Washington, March 2020. Morb Mortal Wkly Rep 2020;69(13):377–81.

[17] Zhai P, Ding Y, Wu X, Long J, Zhong Y, Li Y. The epidemiology, diagnosis and treatment of COVID-19. Int J Antimicrob Agents 2020;55(5).

[18] Shrestha N, Marco Canosa F, Nowacki A, Procop G, Vogel S, Fraser T, et al. Distribution of transmission potential during non-severe COVID-19 illness. Clin Infect Dis 2020.

[19] Tom M, Mina M. To interpret the SARS-CoV-2 test, consider the cycle threshold value. Clin Infect Dis 2020.

[20] Rao S, Manissero D, Steele V, Pareja J. A narrative systematic review of the clinical utility of cycle threshold values in the context of COVID-19. Infect Dis Ther 2020;9(3):373–86.

[21] Uhm J, Ahn J, Hyun J, Sohn Y, Kim J, Jeong S, et al. Patterns of viral clearance in the natural course of asymptomatic COVID-19: comparison with symptomatic non-severe COVID-19. Int J Infect Dis 2020;99:279–85.