

Preadmission COVID-19 testing is an unnecessary use of resources

Abstract

Background: Preadmission testing has been recommended nationwide across specialties in hospitals as a screening tool for detecting asymptomatic COVID-19 positive patients prior to procedures. Healthcare workers (HCW) have been using these results to decide whether or not the patient can have the procedure done as well as to determine whether HCW should use PPE. However, the majorities of these recommendations are from expert opinion and not evidenced based investigations. In the absence of actual data on the benefits of universal screening in asymptomatic patients, clinicians should really consider the possible pros and cons of this. We set out to review previously published research on COVID-19 testing to determine if universal screening can be justified with science.

Conclusion: At this time, there is no evidence-based data for a universal screening program of asymptomatic patients in the absence of contact tracing. Universal PPE use, hand hygiene and the practice of personal prevention measures should be the major component in decreasing the spread of COVID-19 in the hospital setting.

Keywords: 2019-nCoV, acute respiratory distress syndrome, autoimmune, COVID-19, healthcare worker, novel coronavirus 2019, pandemic, personal protective equipment, polymerase chain reaction, preadmission testing, SARS coronavirus, severe acute respiratory syndrome coronavirus 2, severe acute respiratory syndrome

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Abbreviations: ARDS, acute respiratory distress syndrome; HCW, healthcare worker; PPE, personal protective equipment; PCR, polymerase chain reaction; SARS-CoV, SARS coronavirus; SARS-CoV-2, severe acute respiratory syndrome coronavirus 2; SARS, severe acute respiratory syndrome

Background

Preadmission testing is used to identify COVID-19 positive individuals, however false negative testing rates are reported to be up to 30%. A positive Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2) diagnostic nasopharyngeal test indicates the presence of viral RNA, supporting a diagnosis of viral infection within the previous 21 days. Positive test results are used to delay surgical procedures, segregate into COVID-19 positive units which can be viewed as discriminatory. Negative test results are used to justify the avoidance of the use of Personal protective equipment (PPE) by the Healthcare Worker (HCW).

This practice violates ethical principles as false negative test results in COVID positive patients falsely “reassures” the HCW that PPE are not necessary for an individual patient which can put the HCW at risk. True negative test results will also result in decrease use of PPE which pose no threat to the HCW but disregards the patient’s risk from an asymptomatic COVID-19 positive HCW.

In addition to pre-admission COVID-19 diagnostic testing, pre-surgical testing has been advocated because of concerns about

perioperative complications in infected individuals. Initial reports of COVID-19 related perioperative concerns appeared in a report of 11 residents of Wuhan, China who had undergone thoracic surgery between January 1 and January 24, 2020 before all elective surgeries were cancelled due to the COVID-19 pandemic.¹

We conducted a systematic review to evaluate the evidence in support of pre-admission COVID-19 screening of asymptomatic individuals.

Methods

Given the heterogeneity of the studies identified we used a narrative synthesis according to the guidance on conduct of narrative synthesis in systematic reviews.²

Systematic search conducted on May 25, 2020 on in PubMed® (National Center for Biotechnology Information) and Google Scholar for relevant studies in accordance with PRISMA guideline³ to determine evidence for pre-medical intervention or preoperative COVID-19 diagnostic testing using search terms COVID-19 and pre-admission. We also searched the references cited by guidelines issued by professional organizations.

Included: articles discussing pre-intervention, pre-procedure or pre-surgical testing.

Excluded: evaluation symptomatic cases of COVID-19 infection or only expert opinion in support of COVID 19 pre-admission screening.

Results

An initial search was done using Cochrane database, google scholar and PubMed. No relevant articles were found on Google Scholar. There were approximately 105 articles found on PubMed and 4 articles were added from articles references. So, there was a beginning total of 109 articles. Each of the 109 articles found were read in its entirety to determine if it addressed the PCR covid-19 testing in asymptomatic individuals. None of these articles showed any research on testing asymptomatic patients. However, 2 of the articles that addressed the accuracy of the COVID-19 test in symptomatic individuals were included into the review. Many of the articles were eliminated, if there was no discussion on pretesting for COVID-19, if article described severe cases or if article was not in English (1 article was in Chinese).

In one of the studies,⁴ they screened patients using temperature, symptom questionnaire, travel history and imaging to determined who was more likely to have corona and subsequently needed COVID-19 testing. It was stated in this study that only about 1 percent of patients with COVID-19 admitted for management of colo-rectal cancer were found to be asymptomatic and hence this does not justify universal screening for asymptomatic patients in this population.

One study recommended pre-cancer intervention testing to rule out asymptomatic individuals with planned delay of procedure for COVID-19 positive individuals. The cancer patients were screened for likelihood of COVID-19 and those with a positive screen test were given a chest X-ray and COVID-19 diagnostic testing for symptomatic or at-risk individuals.⁵ Depending on how emergent the cancer treatment was, it was determined that emergency cases would proceed with cautions while cases that could have been delayed, would be postponed. The authors did not describe a recommended isolation period before rescheduling the procedure.

Lastly, one of the first clinical reports from a population in Wuhan identified in an author reference list.⁶ This study looked retrospectively at a group of 37 patients who underwent elective surgery during the pandemic, who subsequently became symptomatic and then diagnosed with COVID-19 post-surgery. 3 were excluded as they were exposed to COVID-19 patients during visitation so the exposure could have simply been after surgery. Of the 34 patients, the ages and operative procedures differed, however it was concluded that 44.1% of the patients needed ICU care, and the mortality was 20.5%. These numbers are indeed alarming, but the small sample size makes the study lack power and the post-op testing for COVID-19 does not give an accurate depiction of when COVID-19 was acquired (it is possible for patients to have been exposed to COVID-19 post procedure). These patients were likely in the incubation period as opposed to asymptomatic carriers if they truly had COVID-19 prior to the procedure. However, it is still note-worthy to explore the possible effects of COVID-19 and surgery to determine if testing may be justified for surgical procedures. At this time, not enough information is known and further testing of patient prior to procedure will need to be studied.

Two obstetrical studies which supported the use of pre-admission COVID-19 screening as a mechanism by which to limit the use of PPE for women whose testing was negative and ability to isolate women

whose testing was positive.^{7,8} However, neither of these studies proved that identifying COVID-19 exposure in asymptomatic pregnant patient had any proven benefit for the patient, fetus or HCW. As it stands, COVID-19 has not been proven to be vertically transmitted to the fetus in either symptomatic or asymptomatic patients.

In our search, none of the studies showed evidence-based need for screening of all patients including those that are asymptomatic for COVID-19. In cancer patients, it must be noted that the symptoms of cancer and COVID-19 may be similar and in many cases, treatment should not be delayed despite a COVID-19 diagnosis. Hence PPE use, hand hygiene, and proper sterilization technique is needed more than universal screening. As there is no proven vertical transmission, teratogenicity or effective treatment for COVID-19, universal screening of obstetrics patients is also not yet indicated. Universal precautions, PPE, hygiene and sterilization seem to be a better solution.

Conclusion and recommendation

Universal pre-medical intervention screening recommendations are not evidenced based but rather based on expert opinion. Recently, in England the National Health Service issued guidelines calling for patients to self-isolate for 2 weeks before elective procedures.⁹

Until COVID-19 testing sensitivity approaches the 98% specificity of current COVID-19 diagnostic testing, HCW must be cognizant of the false sense of security that a false negative COVID-19 test results may bring. HCW must also remember that they themselves may pose a risk to the patient and continue to always use PPE at this time.

We recommend use of telehealth tools to screen preoperative patients or obstetric patients before admission. Completion of health care questionnaire developed by CDC and Google and Apple to determine the patient's risk for being infected by COVID-19. These health questions concern respiratory, gastrointestinal, fevers or chills, general well-being, underlying chronic medical illness and known or likely COVID-19 exposure.

We found evidence to support use of Diagnostic COVID-19 testing for symptomatic individuals as a tool to decrease perioperative morbidity and mortality.⁶ However, in the absence of evidence, we only found expert opinion to support COVID-19 screening of asymptomatic individuals before planned surgery or medical intervention. Preoperative COVID-19 screening test results: 1. Positive results-activate contact tracking and isolate for 14 days 2. Negative results- no predictive value about viral presence at the time of surgery and up to 30 % false negative. COVID-19 diagnostic negative testing results should not be an indication to avoid the use of PPE due to the high rates of false negativity. There is a moral obligation to have increased PPE supplies for the health and safety of patients and health care workers alike.¹⁰ Our review suggests in COVID-19 PCR screening should be limited to population surveillance and contact tracing public health programs.¹¹ This viewpoint on not screening asymptomatic patients is subject to change if COVID-19 testing becomes cheaper, quicker and more accurate in its results particularly a higher sensitivity, as well as if there is a proven treatment or intervention for COVID-19 (Figure 1).

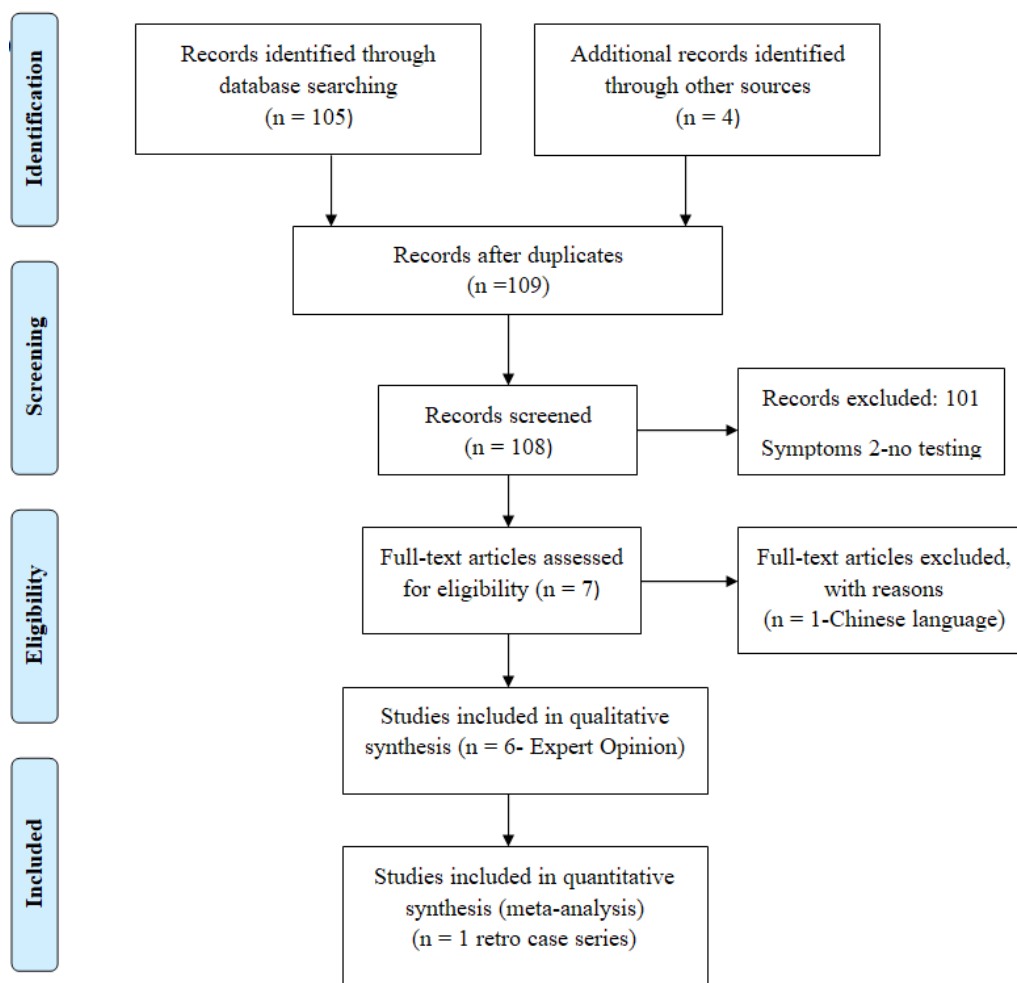


Figure 1 Flow diagram.

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Conflicts of interest

The Authors report no conflict of interest.

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