Exhibit 129

The Problems with the COVID-19 Test: A Necessary Understanding

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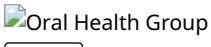

Feature

The Problems with the COVID-19 Test: A Necessary Understanding

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Viewpoint:

Introduction

On August 26th, 2020 Professor Mark Woodhouse, a senior scientific advisor to the UK Government stated the following, "We couldn't think of anything better to do. Lockdown was a panic measure and I believe history will see that trying to control Covid-19 through lockdown was a monumental mistake on a global scale, the cure was worse than the disease."[1] Such a frank admission from an infectious disease epidemiologist is significant because it emphasizes a failure by governments to appreciate the limitations of the coronavirus tests on which all policies and precautions to eliminate or reduce the spread of Covid-19 are based. This article will attempt to unravel the complexities of a test whose results are far from definitive.

The Coronavirus Test

The Background

1. What Is A Virus? A virus consists of nucleic acids (DNA or RNA) surrounded by a protein coat. The coat has adaptations on it (coronavirus spikes) which by facilitating entry, allow the virus to infect a cell. Upon entering a cell, the protein coat is shed causing genes of the virus to commandeer the host cell's replication techniques to reproduce the virus's DNA or RNA. New viruses then leave the cell and infect other cells in a similar manner.[2]

It is important to appreciate that viruses cannot self- replicate but do so by parasitizing living cells to the detriment of those cells. Viruses are not capable of thriving or reproducing outside of a viable host.[2]

The new coronavirus is now referred to as SARS-CoV-2. It is an RNA virus with an estimated diameter of between 60 nanometers to 140 nanometers. A single strand of human hair would be 400 to 1,000 times larger than a single SARS-CoV-2 virus.[3]

2. Koch's Postulates. In 1890 Robert Koch a German physician described four conditions which should be met before a microorganism could be deemed a human pathogen. With the discovery and improved understanding of viruses it was realized that the postulates were not applicable to them since, as intracellular parasitic bodies, they were not easily purified nor cultured. Although this appreciation made it difficult to prove that a virus caused a disease, it was understood that a need existed for guidelines which would prevent correlation of a virus with an illness as indicative of it being the causative agent of that illness.[4]

Over the years Koch's Postulates have been adapted and modified such that there are eight criteria that preferably should be satisfied before a causal relationship can be said to exist between a virus and an infection.[4]

3. SARS-CoV-2 and Koch's Postulates. The first paper on the new coronavirus warned that it did not satisfy the modern version of Koch Postulates.[5] This was emphasized in a later article in the Journal of Medical Virology which stated, "The data collected so far is not enough to confirm the causal relationship between the new type of coronavirus and the respiratory diseases based on classical Koch's postulates or modified ones as suggested by Fredricks and Relman."[6]

Despite these reservations it has been overwhelmingly accepted that SARS-CoV-2 is the etiological agent of what has become known as Covid-19.

4. The Gold Standard. No test is 100% accurate. Determining the accuracy and reliability of a test for a pathogen requires the presence of a gold standard. According to Trevethan a gold standard provides, "authoritative, and presumably indisputable, evidence that a condition does or does not exist."[1]

Developing a gold standard for SARS-CoV-2 requires isolating the whole virus (not just fragments of it) and showing that the isolated virus is capable of reproducing itself in culture cells.[8]

Laboratories would use such isolates as a gold standard to assess the efficacy of the tests that purported to identify the intact new virus. A recent extensive review concluded that studies to isolate and culture SARS-CoV-2 were of poor quality and lacked assessment against an acceptable gold standard.[8] Another report noted that while in previous international health emergencies viral isolates were available to validate tests, in the case of

SARS-CoV-2, “virus isolates or samples from infected patients have so far not become available to international communities.”[9] Indeed, in July 2020, the Centers for Disease Control (CDC) stated that no quantified virus isolates for the SARS-CoV-2 existed.[1]

Since the SARS-CoV-2 test is highly sensitive for the presence of RNA some authorities consider it to be a Gold Standard. This is not correct as its highly sensitive nature means that it can detect any RNA present which might or might not be part of SARS-CoV-2.

5. Polymerase Chain Reaction (PCR). The polymerase chain reaction was invented by Nobel Laureate Kary Mullis in 1983 essentially as a research rather than diagnostic tool.[11] Its primary function is to make many copies of a specific region of DNA such that this target area can be better analysed.[11]

The first step in the reaction is denaturing by heating which separates double stranded DNA into two separate single strands which act as templates. The second cooling or annealing stage, uses DNA primers (about 20 nucleotides in length) which are shorter than, but which bind to, part of the specific region of the DNA that is to be copied. In the third or extension phase heat is again used in cooperation with a DNA polymerase to extend the primers by synthesizing new strands of DNA to make exact copies of the target area. Thus, after one cycle of sequential heating, cooling and heating, there are two copies of the target area. These copies then serve as templates for the next cycle of the reaction. The second cycle will produce four copies and so on such that after 30-40 cycles there could be many millions of copies of the specific region of DNA under investigation.[11] For example, the approximate number of copies produced by running 24 cycles is 16million, 33 cycles is 8.5 billion and 40 cycles is 1 trillion.

The Actual Test

1. Quantitative Fluorescence-Based Reverse Transcriptase Polymer Chain Reaction (RT-qPCR). Although there is considerable concern regarding the reliability of this test, it is the one most widely used to test for the presence of SARS-CoV-2.[12]

Since SARS-CoV-2 is an RNA virus the first phase of the test is to use an RNA- dependent DNA polymerase (i.e. reverse transcriptase) to copy the targeted RNA sequence into complimentary DNA. The second stage uses DNA polymerase which amplifies or copies the complimentary DNA as per the polymer chain reaction. In addition, fluorescent markers are added which bind to the amplified DNA. After each cycle the intensity of light from the fluorescent markers increases corresponding to the increasing number of DNA copies. In theory, this allows the amount of DNA – acting as a surrogate for the targeted RNA- to be assessed in real time.[13]

The assumption is that the more of the surrogate DNA there is at the beginning of the reaction, the fewer the cycles it will take to reach a fluorescent intensity or threshold level that has been predetermined to indicate the presence of SARS-CoV-2.[12] The number of cycles taken to reach this level is known as the cycle threshold or Ct.[14]

2. Cycle Threshold. Ct values are set by test kit manufacturers and by testing laboratories.[14] They are not standardized within provinces or countries which adds to the unreliability of the COVID-19 test.[12] Recent papers have suggested that a Ct greater than 24 should not be used to infer the presence of a “live or infectious” virus since above that level the exquisite sensitivity of the test will amplify sequences of viruses from other sources.[8,15] The sources could be; “dead or non-infectious” SARS-CoV-2, general cell debris, endemic coronaviruses, other pathogens, and from contamination during collection, transportation and preparation of samples.[12]

The CDC accepts a Ct of around 40.10 In Canada the Ct levels range from a low of 33 in Newfoundland to a high of 45 in Quebec.[16] In Ontario the Ct ranges from 38-45.[16] The Canadian levels appear to be high since the increase in cycles between 24 and 45 would increase by billions the amount of RNA which might include not only the unique gene sequence purported to represent SARS-CoV-2 but “foreign RNA” from the sources previously noted. According to a recent Canadian investigation, “an individual who tests positive with cycle count of 35-40 is very likely not contagious and would not require self-isolation, because their viral load would be extremely low.”[16] This concurs with a statement by Dr. A. Fauci of the US National Institute of Allergy and Infectious Diseases. In a July 16th 2020 podcast for “This Week in Virology” he clearly implied that tests performed at Ct levels of 35 or above do not reliably indicate the presence of live infectious viruses. On July 30th, 2020, Dr. Barbara Yaffe (Director of Communicable Disease Control, Toronto Public Health) told the media that, “In fact, if you are testing in a population that doesn’t have very much COVID, you’ll get false positives almost half the time. That is, the person actually doesn’t have COVID, they have something else. They may have nothing.”[16] In theory a negative COVID-19 test could be converted from negative to positive simply by raising the Ct value. The opposite is also true. For example, a person testing positive after 38 cycles in Ontario would test negative following 33 cycles in Newfoundland.

With Ct levels in Canada varying from 33 to 45, it is not surprising that, “up to 90% of the Canadian COVID cases could be false positives…”[16] Since Canadian test results are recorded simply as RT-PCR positive or negative (yes or no) without indicating the Ct level, the interpretation of a result is fraught with ambiguity. An article in the July 2020 edition of the Journal of Medical Virology expressed caution about using the RT-qPCR test as the sole means of diagnosing COVID-19 without evidence of confirmatory clinical signs and symptoms.[17]

For all of the above reasons, a healthy dose of scepticism should be applied to all cases labelled as COVID-19 solely on the basis of a positive test result.

3. Clinical Implications. The RT-qPCR test amplifies converted RNA enough times allowing it to be detected. Mullis was quite adamant that PCR-viral load tests do not detect free infectious viruses, but rather identify genetic sequences of viruses.18 Recently Bullard emphasized that conclusion by stating, "RT-PCR detects RNA, not infectious virus…"[15] It is not the whole virus that is being amplified but bits of its genetic sequence which, without the protein coat, are not infectious. Therefore, it is a mistake to infer that the test identifies whole infectious virus. In addition, the test assumes that the small gene segments are unique to SARS-CoV-2. However, since no acceptable viral isolates are available to confirm this relationship, the assumption is highly questionable. As noted above, the RNA sequences that are being amplified by surrogate DNA could be from sources other than SARS-CoV-2.

The many problems associated with the COVID-19 test have been identified by the CDC which in a recent publication noted that:

- The presence of viral RNA in the sample might not indicate the presence of infectious virus;
- The presence of viral RNA does not necessarily imply that SARS-CoV-2 is the causative agent of COVID-19;
- The test cannot rule out diseases caused by other bacterial or viral pathogens;
- The test is not suitable for screening blood and blood products for the presence of SARS-CoV-2;
- If the virus mutates in the predetermined target region, the test is invalid;
- The optimum time to detect peak viral levels during an infection has not been established.[10]

Conclusions

The failure to satisfy Koch's modified viral postulates and the inability to satisfactorily isolate SARS-CoV-2 should casts doubts on the efficacy of any test that purports to identify the causative agent of COVID-19. In highly technical reports authorities bemoan the absence of clearly defined standards for the collection, transportation and preparation of samples which lead to errors in the interpretation of results.[8,9,12,14] This dilemma is exaggerated by the absence of internationally accepted validation criteria. Until all of the above are corrected Bustin is of the opinion that testing programs for SARS-CoV-2 are, "wholly inadequate, poorly organized and surrounded by confusion and misinformation."[12]

This understanding means that all the policies, procedures, recommendations and preventive measures associated with COVID-19 are based on a questionable foundation. Had the limitations of the test been fully appreciated by Professor Woodhouse he would not have been admitting to a monumental mistake.

The dental profession has not escaped this conundrum. All of its recent alterations to patient care are based on the assumption that tests identifying infectious SARS-CoV-2 are accurate. The fact that this is patently incorrect should stimulate a reassessment of the relationship between dentistry and COVID-19. Further reasons for this advocacy will be identified in future articles which will discuss the likelihood that a patient testing positive does in fact have COVID-19 and the true lethality of the infection.

Oral Health welcomes this original article.

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Only the principal authors have been identified.

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About the Author

Although retired from practice, Dr. John Hardie maintains a thirty-plus-years interest in the discipline of infection control as it relates to dentistry. He has published extensively on the subject and has lectured on it and related subjects throughout North America and in the UK, Europe, the Middle and Far East.