

Clinical reasoning during the COVID-19 pandemic

COVID-19 was declared a pandemic in March 2020 by the World Health Organization.^[1] Since then, medical science has faced several challenges in clinical reasoning. Here, we tried to summarize and map these challenges and then look for possible solutions; this may draw a hypothetical roadmap to resolve the pitfalls of medical practice and education in the future.

PHENOMENOLOGICAL DILEMMA

Like any other emerging disease, at first, a lack of knowledge existed to form the most fitted core scheme of the disease prototype. Initially, many expressed their nosological classification based on the resemblance of findings to other clinical entities; later on, pathological clustering of the disease and its features were developed. However, these may be with fuzzy borders leading to restrictions on clinical reasoning for physicians. The all-obvious fact is that COVID-19 covers more than just a respiratory disease^[2] and can be presented even with an upper gastrointestinal bleeding^[3] or with a Guillain-Barré syndrome.^[4] Thereby, “the great imitator” might be an appropriate title considering the dynamic status and multiple presentations of this virus; causality relations between many rare presentations and the virus were hard to establish.

INDETERMINATE RECOMMENDATIONS AND GUIDELINES

The unknown features of the disease and the urgent need to obtain data to fill these gaps have resulted in numerous studies with many controversies; high volume of information is being circulated, and despite all the flaws of the published original studies, physicians cite them in their practice, subsequently delay in regular production of strong uniform evidence-based recommendations, but consensus-based contradictory guidelines made clinical reasoning difficult since the illness script of COVID-19 was not complete^[5] and these practice codes neither followed analytical approaches nor demonstrated another clear reasoning pattern.

We would like to emphasize that a study with inconclusive results should be seen as “no evidence at all” rather than “better than nothing” in formulating recommendations. What is more, in the absence of

sufficient understanding of COVID-19, our treatment was mostly based on compassionate treatment or scarce evidence of weak clinical trials.

CLINICAL INCOMPETENCE

Along with uncertainty of treatment options, physicians were under pressure to do “something” urgently for a theoretically life-threatening condition and accelerate the application of any available pharmacotherapy. Although all patients should be ethically informed about the possibility of efficacy rates as well as maleficence of therapeutic modalities, it was missed during the tsunami of case load and catastrophic complications. On the other hand, many caregivers were not familiar with the “follow-the-order” fact during a public health crisis; they started to use their imaginary concept maps and give their home-made panacea and announce it as delightful serendipity.

Health-care staff anxiety due to high transmissibility and mortality rates of COVID-19 has put the medical team under tremendous pressure, and this consequently caused the possibility of diagnostic errors because of avoiding regular clinical exposure to the patients and therefore incomplete data collection.

WHAT CAN WE DO DURING NEXT PANDEMIC?

Many ongoing investigations are attempting to meet the needs of the first two of the above mentioned challenges, including providing comprehensive data to define different aspects of COVID-19 as well as compiling guidelines, audits, and evaluations to achieve high-quality holistic care. Here, we propose the followings to minimize the contextual difficulties of a clinical system:

1. To form a more realistic picture of the disease, data gathering to a large extent is an essence and it could not be done without the design and implementation of patient registries, case report repositories, and dynamic analysis of datasets. This could be accomplished by a joint work of public health authorities (responsibly for gathering infectious disease outbreaks and surveillance), clinical scientists (in charge of clinic-based registries and with link to biomedical scientists), and data scientists (including epidemiologists who actively analyze the inputs to draw core picture of the entity). This epidemic taught us that large data sets are needed that enable the international community to share in a scientific campaign and find the best fitted clinical scheme
2. In the beginning, it was emphasized to follow analytical reasoning and to maintain the

recommended data gathering sequence. As our knowledge develops, nonanalytical reasoning appears to be more helpful to answer this question based on our experiences and pattern of disease: is the diagnosis of the patient COVID-19 or not? In the era of evidence-based medicine (EBM), randomized controlled trials are the mainstays to guide clinical scientists; when synthesizing new knowledge, we are to define strictly that which COVID-19 disease stage was included in the study: community-based low symptomatic case versus hospitalized patient versus severe intensive care confined ones with hyperimmune cytokine storm underwent mechanical ventilation. Let's refer to original PICO questions in EBM ask ourselves which P are we talking about? Metacognitions should be reintroduced and reemphasized about the nature of clinical reasoning not only for practitioners but also for clinical guideline developers/adaptors. The care providers must be informed about the nature and process of decision-making in a disaster; the situation must be managed mainly according to "code-of-practice" not personal judgment in most cases. On the other hand, guideline developers must be vigilant and watchful for ever-changing best available evidence as they process these data continuously to form the most consistent cost-efficient nonharmful recommendations and avoid bursts of scientific impulse-induced uncontrolled emotional decisions

- To avoid cognitive errors, the pressure on the clinical community (including trainees) should be diminished during times of uncertainty^[6,7] by a decrement of workload, considering time constraints, improving clinical reasoning skills using virtual methods,^[8-12] and encouraging teamwork. It is reasonable that one person alone does not decide in complex cases like severe intensive care patients with multi-organ complications. The collaborative clinical reasoning process is organized officially to reach a team decision. It is also essential to convert information into plain language communication to provide shared clinical decision-making; this may reduce compassion decision fatigue due to improper communication between physician and patient and her/his relatives. The balance between empathy and detachment in critical situations is to be institutionalized. We have long neglected the role of care in our physicians and prioritized the patient's demands first and need to assure a high level of protection against COVID-19 and similar pathogens for the health-care team to improve the quality of care for patients and maintaining working in a safe and fearless environment. To do all of these and to prevent burnout and dropout of personnel

that affects the cognitive abilities of the whole team, a human resource management system must be planned and scheduled to be recalled during another health disaster that maintains sustainable human resources during and after the outbreak.

To conclude, accurate clinical reasoning for COVID-19 has interfered with the following principal challenges that might throw us back to the era of "I think, and I work:" knowledge gap of an emerging disease with a broad spectrum of manifestations, absence of an approved treatment regimen, and workload and social pressure of clinical work. The learned items, if approached logically and systematically, may guide clinical managers/educators and the clinician to revive the essentials of real-time clinical reasoning from phenomenology to methodology.

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