COVID-19 Stage Migration (CSM): a New Phenomenon in Oncology?

Chandrakanth Are¹

Received: 24 March 2021 / Accepted: 4 May 2021 / Published online: 12 May 2021
© Indian Association of Surgical Oncology 2021

Abstract

The current COVID-19 pandemic has led to severe disruptions in health care delivery for cancer patients. These interruptions in cancer care delivery may have an unknown effect on cancer outcomes at the individual and population level. These yet to be known variations in individual and population-level cancer outcomes resulting from COVID-19 related interruptions in care can be labeled as COVID-19 Stage Migration (CSM).

Keywords COVID-19 · Stage migration

The Great Depression which started around the 1920s was the worst economic collapse recorded for the modern world. In an instant, this calamitous event transformed the lives of everyone sparing no country across the world. In the United States of America, the Great Depression combined with a severe drought led to the westward migration of people from the middle of the country. Nearly 400,000 people left the 19 states to travel westwards for a better life. This tragic event has been depicted in many ways by the entertainment and publishing industry as demonstrated by the multiple movies and books that were produced or published. It is noted that Will Rogers, an entertainer, may have commented on this tragic event in the 1930s with a humoristic twist.

Little did Will Rogers know that this humoristic utterance attributed to him would serve the basis for a cancer-related phenomenon adopted into the Oncology lexicon by A.R. Feinstein [1]. A.R. Feinstein noted that patients diagnosed with lung cancer and first treated in 1977 had a higher 6-month survival for the total group and any sub-group when compared to patient cohort treated in an earlier period between 1953 and 1964. This was likely due to better diagnostic techniques which led to more accurate staging of the extent of disease. A.R. Feinstein proposed the concept of Will Rogers phenomenon to describe stage migration due to better diag-

nostic tests which improves survival rates in each group as a whole without meaningful change in the individual survival rates.

Here, we are almost a century later living through another calamity not known or experienced by anyone living now. A centenarian or two may have lived through it but would not have been old enough then to offer any wisdom on how to deal with it now. With nearly 110 million cases and 2 ½ million deaths worldwide, this pandemic has essentially rocked the foundation of modern living [2]. In one fell swoop, it has had and continues to have devastating effects on every aspect of humanity. This pandemic has affected every realm of modern life: health and healthcare delivery, economy, travel, social patterns, human behaviors, and many others.

The damaging effects of COVID-19 on healthcare delivery are far too obvious for this audience to ameliorate the need for any elaboration. The disruptions in the supply chains for health care delivery have been substantial for all types of diagnoses. A 155-country survey conducted by the World Health Organization to assess the magnitude of disruptions in care for non-communicable diseases revealed alarming findings [3]. This survey was conducted over a 3-week period during the month of May. The study revealed that nearly 53% of the countries surveyed documented partial or complete disruption of healthcare services which varied according to the diagnosis.

Severe disruptions in cancer treatment were noted by 42% of the countries. Although many countries (72% of high-income countries and 42% of low-income countries) included cancer care in their national COVID-19 preparedness and response plans, severe disruptions became the norm. For example, screening for breast and cervical cancer dropped by 50%.

✉ Chandrakanth Are
care@unmc.edu

¹ Division of Surgical Oncology, Department of Surgery, Fred and Pamela Buffett Cancer Center, University of Nebraska Medical Center, Omaha, NE 68198, USA

Although this was done to target all efforts and resources to treat the COVID-19 burden, its effects on cancer care are inescapable. In addition, alterations of planned treatment (for example: cancelation of cancer surgical procedures, interruptions, or excess of systemic and radiation therapy) will have a long-term effect on the individual patient and society.

So, what happened to all those patients during this 2–3-month period when they did not receive the proposed originally planned treatment as dictated by their disease stage and the established evidence-based protocols. This sudden unplanned interruption in their treatment algorithm will or may have some effect on the disease status (stable/progression/regression) and prognosis for the individual and the entire population. A study by Hanna et al. from the early period of the pandemic documented increased mortality due to delays in cancer treatment [4]. They noted that even a 4-week delay of cancer treatment is associated with increased mortality across surgical, systemic treatment, and radiotherapy indications for the seven analyzed cancers. Although this was a systematic review and meta-analysis, it is too early to predict the ultimate population level outcomes based on this one study. This yet to be known outcome and effect on the ultimate prognosis resulting from interruption of treatment due to COVID-19 can be labeled as the COVID-19 Stage Migration (CSM).

During the phase of CSM, many changes were made to the originally planned treatment for many cancer patients. For example, some patients that completed their expected cycles of neo-adjuvant therapy were asked to continue systemic therapy due to cancelation of elective surgery. Did this delay lead to any CSM of their disease and place them in a more advanced stage of disease with a worse prognosis. Or did it make no difference at all whether they were able to receive extra cycles of systemic therapy notwithstanding the travel restrictions and social distancing. Or could it be that the extra dosage of systemic therapy had no beneficial effect.

On the other hand, should something along the lines of CSM be more actively embraced. The debate about when to operate following neo-adjuvant therapy for rectal or esophageal cancer continues unabated. Many such patients with rectal and esophageal cancer had their treatments delayed during the last 2–3 months. It will be interesting to see how this will affect the long-term prognosis and if it did, was any such effect due to CSM. If the prolongation of the time-period between completion of neo-adjuvant therapy and surgical intervention did not have any effect or a beneficial effect on the ultimate prognosis, then should we operate later than the

current practice. Might this unintended change in treatment plan have an unintended benefit of helping us improve patient selection for surgical intervention.

And how about those patients whose initial diagnosis may have been delayed due to the abrupt cessation of cancer-screening services and the attendant delay in any form of treatment. It will be difficult to know how this delay would affect their stage of disease or ultimate prognosis. Finally, what about those patients with a known diagnosis of cancer who could not receive any form of treatment.

Suffice it to say for now that, we do not have a full understanding of the scope or effects of CSM on the ultimate prognosis at the individual or population level. In months or years to come, if we witness an altered terrain or landscape of cancer patterns and behavior at the individual or population level, it may well be due to CSM. And, we as Oncologists need to bear that in mind.

Availability of Data and Materials Not applicable.

Code Availability Not applicable.

Declarations

Ethics Approval Not applicable.

Consent to Participate Not applicable.

Consent for Publication Not applicable.

Conflict of Interest The author declares no conflict of interest.

References

1. Feinstein AR, Sosin DM, Wells CK (1985) The Will Rogers phenomenon. Stage migration and new diagnostic techniques as a source of misleading statistics for survival in cancer. *N Engl J Med* 20: 1604–1608
2. <https://coronavirus.jhu.edu/map.html>. Accessed February 18th, 2021
3. <https://www.who.int/news-room/detail/01-06-2020-covid-19-significantly-impacts-health-services-for-noncommunicable-diseases->. Accessed 6/26/2020
4. Hanna TP, King WD, Thibodeau S et al (2020) Mortality due to cancer treatment delay: systematic review and meta-analysis. *BMJ* 371:m4087. <https://doi.org/10.1136/bmj.m4087>

Publisher's Note Springer Nature remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.