



Study on the effects of COVID-19 Pandemic on Cancer Treatment and Research

**Daniel Broomfield¹, Daniel V. Ross¹, Farah I. Albarahmeh¹, Joseph G. Azzi¹
and Olugbenga Morebise^{1*}**

¹*All Saints University School of Medicine, Roseau, Dominica.*

Authors' contributions

This work was carried out in collaboration by all authors. All authors designed the study. Authors DB, DVR, FIA and JGA wrote the protocol, performed the literature searches and the statistical analysis, and wrote first draft of the manuscript under the supervision of author OM. All authors read and approved the final manuscript.

Article Information

DOI: 10.9734/JAMMR/2021/v33i1430977

Editor(s):

- (1) Dr. Muhammad Torequul Islam, Bangabandhu Sheikh Mujibur Rahman Science and Technology University, Bangladesh and Ton Duc Thang University, Vietnam.
(2) Dr. Sevgul Donmez, Mugla Sitki Kocman University, Turkey.
(3) Dr. Rameshwari Thakur, Muzaffarnagar Medical College, India.

Reviewers:

- (1) Ahmed M Elzawawy, Suez Canal University, Egypt.
(2) Archana Buch, Dr. D. Y. Patil Medical College Hospital and Research center, India.
(3) Ana Paula de Souza Votto, Universidade Federal do Rio Grande - FURG, Brazil.
Complete Peer review History: <http://www.sdiarticle4.com/review-history/69099>

Mini-review Article

**Received 18 April 2021
Accepted 23 June 2021
Published 29 June 2021**

ABSTRACT

The Covid-19 pandemic has changed the way that healthcare systems and research centers across the world operate. Resources are now being poured into fighting the pandemic. Unfortunately, these resources are often drawn from other healthcare sectors. The focus of this paper is to determine how the shift of resources affects how cancer treatment and cancer research across the globe. Previous research in this topic is sparse, so looking into how cancer research and treatment has been affected can prove beneficial by highlighting the affected treatment methods for cancer patients so that healthcare teams will be able to allocate resources for particularly vulnerable patients once resources are available. Research has discovered that the shift of resources has led to a decrease in screenings for various types of cancer. Furthermore, clinical trials for new cancer treatments have been paused as well. This has led to an increase in cancer-related mortality, for many different types of cancer. However, some healthcare systems are adapting to these changes by increasing their use of telemedicine, which patients have

*Corresponding author: E-mail: olugbenga.morebise@allsaintsuniversity.org, olugbengamorebise@gmail.com;

welcomed. This shows that resources being taken away from cancer treatment and research has had a negative impact on cancer care but as the pandemic progresses, healthcare workers are finding ways to care for their patients.

Keywords: Covid-19 pandemic; cancer care; treatment; healthcare workers.

1. INTRODUCTION

Covid-19 has been responsible for killing more than one million people worldwide. Among those at risk of developing severe forms of the disease are patients with cancer [1]. In patients with cancer, Covid-19 can be especially harsh [2]. This is likely because many patients have a weakened immune system – either as a result of the cancer itself or the therapies used to treat it – and are therefore less able to fight off infection by the novel coronavirus [2]. Research into why patients with cancer are at heightened risk is moving very quickly. The state of the scientific understanding of this area and others related to both cancer and Covid-19 will be examined [2].

It has been found that the adverse consequences of Covid-19 in patients with cancer are particularly serious [3]. Furthermore, due to pandemic priorities and resource constraints during the peak of the pandemic, medical services for chronic diseases, including cancer, have been at least partially interrupted [4,5]. In the context of the increased risk of

SARS-CoV-2 infection, healthcare providers and patients must continue to reassess the balance between risk and cancer-oriented interventions (WHO, 2020). In addition to interference with cancer care services, cancer research during the pandemic has also been disrupted, including basic, translational and clinical cancer research [6].

2. METHODOLOGY

A literature review of available and current data was conducted. Each member of the research team was assigned a task, specific to the study priorities. Data, from other peer reviewed sources were collected and appropriately summarized. Results were discussed and all relevant aspects were included and used in the study.

3. RESULTS AND DISCUSSION

Results obtained from the study are presented in the Tables and Figs. below.

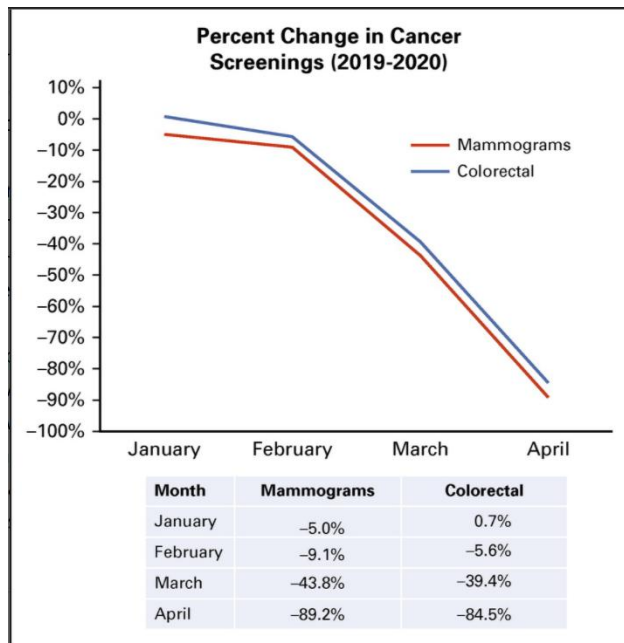


Fig.1.The decrease in breast and colorectal cancer screening during the Covid-19 pandemic [7]

Table 1. The percentages of lead investigators who have stopped clinical trials [8]

Lead investigator	Percentage
Clinical trials representatives	44.0%
Community-based program leaders	56.0%
Clinical & nonclinical research directors	46.9%
Physician investigators	43.8%
N=32 US-based research institutional representatives	

**Clinical trials representative should be changed to clinical trials representative
N =32 US-based research institutional representatives should be changed to representatives

Table 2. The increase in cancer-related mortality due to delayed screening [9]

	(n=)	Increased cancer mortality rates
Breast cancer	32,583	7.9-9.6%
Colorectal cancer	24,975	15.3-16.6%
Lung cancer	29,305	4.8-5.3%
Oesophageal cancer	6,744	5.8-6.0%

Table 3. The positive effects of telemedicine compared to baseline [10]

SMD = 0.60, 95% CI	High quality of life, less depression, distress and perceived stress	SMD = standard mean difference. # of randomized control trials = 20
SMD = 0.59, 95% CI	Self-efficacy	N = 2190
SMD = -1.29, 95% CI	Depression	
SMD = -0.25, 95% CI	Distress	
SMD = -0.30, 95% CI	Perceived stress	

Table 4. Treatment of cytokine storm in Covid-19 patients using acalabrutinib [11]

Treatment: Acalabrutinib; Course: 10-14 days	
Patients discharged off oxygen	72.70%
Patients extubated from medical ventilator	50.00%
N=19 hospitalized patients w/ severe COVID-19	

As could be seen in the tables and figures above, the field of cancer research has experienced unique challenges because of the Covid-19 pandemic. Several clinical research institutions paused enrollment of cancer therapy trials as the pandemic increased in magnitude. A survey of principal investigators conducted by researchers found that routine screening decreased by 85-90% [7]. A survey conducted by another group of researchers found that clinical cancer trials were stopped among 60% of respondents as seen in Table 1 [8]. Each respondent was a representative of a cancer research organization [8].

One way that clinicians have attempted to circumnavigate the Covid-19 pandemic is by using remote viewing [10]. A systematic review of 20 randomized control trials by Chinese researchers in the use of telemedicine showed

an overall increase in patient well-being [10]. As shown in their study, telemedicine is as effective as face-to-face encounters for mental health treatment [10] Table 3 provides details of this study.

A population-based modelling study consisting of over 93,000 patients was conducted by researchers in the UK [9]. The study predicts the effects of delayed screening on cancer-related mortality rates within five years. Overall, the researchers predicted there will be a 4-17% increase in cancer-related deaths due to delayed screening tests [9]. The variability in mortality rates depends on cancer type [9]. Table 2 illustrates the results from this study [9].

A promising therapeutic approach to treating Covid-19 is being developed by researchers.

Therapies that have been used to treat cancer are showing value in treating the virus. For example, medications used to resolve cytokine release syndrome (CRS) in patients with a tumor are showing to be effective in treating a cytokine storm in patients with Covid-19 [11]. Researchers [11] used a medication called acalabrutinib and found fast improvements in oxygenation levels along with a significant decrease in inflammation in patients with Covid-19 (shown in table 4).

CONCLUSION

There has been a considerable amount of information amassed in the scientific community relating to the interaction between Covid-19 and cancer. The scientific community has made gains and losses in attempting to control Covid-19. To limit the spread of the virus, many research institutions placed limits on personnel in physical workspaces, which greatly strained human resources [8]. In addition, the increased level of workplace hazards brought on by Covid-19 forced many cancer research organizations to stop screening patients and conducting clinical trials [8,9].

However, by using innovative and creative approaches to treatment cancer research has evolved and may continue to use these new approaches in a post-pandemic period [10] Unexpectedly, some cutting-edge cancer treatments also developed importance in treating Covid-19. As Bakouny remarks, "This review gave us an opportunity to take a step back and take stock of what we've learned – to get a sense of the most promising directions for patients, as well as where more study is needed, what we need to dig deeper into" (Bakouny et al., 2020).

CONSENT

It's not applicable.

ETHICAL APPROVAL

It's not applicable.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

REFERENCES

1. Ioannidis JP. Global perspective of Covid-19 epidemiology for a full-cycle

- pandemic. *European Journal of Clinical Investigation*. 2020;50(12):e13423.
2. Fung M, Babik JM. Covid-19 in immunocompromised hosts: what we know so far. *Clinical Infectious Diseases*. 2021;72(2):340-350.
 3. Garassino MC, Whisenant JG, Huang LC, Trama A, Torri V, Agustoni F, Horn L. Covid-19 in patients with thoracic malignancies (TERAVOLT): first results of an international, registry-based, cohort study. *The Lancet Oncology*. 2020;21(7):914-922.
 4. Colbert LE, Kouzy R, Abi Jaoude J, Ludmir EB, Taniguchi CM. Cancer research after Covid-19: where do we go from here?. *Cancer cell*. 2020;37(5):637.
 5. Saini KS, de Las Heras B, de Castro J, Venkitaraman R, Poelman M, Srinivasan G, Saini ML, Verma S, Leone M, Aftimos P, Curigliano G. Effect of the COVID-19 pandemic on cancer treatment and research. *The Lancet Haematology*. 2020;7(6):e432-5.
 6. Schrag D, Hershman DL, Basch E. Oncology practice during the Covid-19 pandemic. *Jama*. 2020;323(20):2005-2006.
 7. London JW, Fazio-Eynullayeva E, Palchuk MB, Sankey P, Mc Nair C. Effects of the Covid-19 pandemic on cancer-related patient encounters. *JCO Clin. Cancer Inform*. 2020;657–665.
 8. Waterhouse, D.M., Harvey, R.D., Hurley, P., Levit, L.A., Kim, E.S., Klepin, H.D., Mileham, K.F., Nowakowski, G., Schenkel, C., Davis, C., et al. (2020). Early impact of Covid-19 on the conduct of oncology clinical trials and long-term opportunities for transformation: findings from an American society of clinical oncology survey. *JCO Oncol. Pract*. Available:<https://doi.org/10.1200/op.20.00275>.
 9. Maringe C, Spicer J, Morris M, Purushotham A, Nolte E, Sullivan R, Rachet B, Aggarwal A. The impact of the Covid-19 pandemic on cancer deaths due to delays in diagnosis in England, UK: a national, population-based, modelling study. *Lancet Oncol*. 2020;21:1023–1034.
 10. Chen Y-Y, Guan B-S, Li Z-K, Li X-Y. Effect of telehealth intervention on breast cancer patients' quality of life and psychological outcomes: A meta-analysis. *J. Telemed. Telecare*. 2018; 24:157–167.

11. Roschewski M, Lionakis MS, Sharman JP, Roswarski J, Goy A, Monticelli MA, Roshon M, Wrzesinski SH, Desai JV, Zarakas MA, et al. Inhibition of Bruton tyrosine kinase in patients with severe Covid-19. *Sci. Immunol.* 2020;5. Available: <https://doi.org/10.1126/sciimmunol.abd0110>.

© 2021 Broomfield et al.; This is an Open Access article distributed under the terms of the Creative Commons Attribution License (<http://creativecommons.org/licenses/by/4.0>), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

Peer-review history:
The peer review history for this paper can be accessed here:
<http://www.sdiarticle4.com/review-history/69099>