

COVID-19 and Lung Cancer: Strengthening the Prevention Component and Improving the Prognosis

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Abstract

The coronavirus disease-2019 (COVID-19) pandemic overwhelmed health-care delivery systems owing to the significant morbidity and mortality. Lung cancer in the year 2020 alone has accounted for more than 2.2 million new cases and 1.8 million deaths across the globe. The purpose of the current review is to explore the impact of COVID-19 on lung cancer and to identify measures that can improve the prognosis of cancer patients during the ongoing COVID-19 pandemic. An extensive search related to the topic was carried out in the PubMed and World Health Organization website. Relevant research articles focusing on COVID-19 and lung cancer published between April 2020 and June 2021 were included in the review. Forty-five studies similar to the current study objectives were identified initially. Among them, five were excluded due to unavailability of the complete version of the articles. Overall, forty articles were selected based on the suitability with current review objectives. Keywords used in the search include COVID-19 and Lung cancer in the title alone only. It has been estimated that patients with lung cancer will have a significantly higher risk of an adverse outcome, if they acquire COVID-19 infection. National bodies across multiple nations have released recommendations for both prevention and optimal management of COVID-19 infection among known lung cancer patients. To conclude, the COVID-19 pandemic has significantly affected patients with lung cancer. Owing to the emergence of evidence of poor prognosis of infection among lung cancer patients, there is an indispensable need to adopt a multidisciplinary treatment approach.

Keywords: Coronavirus disease-2019 pandemic, lung cancer, World Health Organization

INTRODUCTION

The coronavirus disease-2019 (COVID-19) pandemic overwhelmed health-care delivery systems owing to the significant morbidity and mortality. In fact, since the start of the outbreak, more than 175 million cases and 3.79 million deaths have been attributed to the infection.^[1] It is quite an alarming fact that the infection has been reported in 222 nations and territories.^[1] On the other hand, lung cancer continues to remain the second most common cancer in terms of incidence, accounting for more than 2.2 million cases, while it is the leading cancer in terms of death (1.8 million) in the year 2020 alone, and has been acknowledged as an important public health concern.^[2] The purpose of the current review is to explore the impact of COVID-19 on lung cancer and to identify measures that can improve the prognosis of cancer patients during the ongoing COVID-19 pandemic.

METHODS

An extensive search of all materials related to the topic was carried out in the PubMed search engine and World Health Organization website. Relevant research articles focusing on COVID-19 and lung cancer published from April 2020 to June 2021 were included in the review.

A total of 45 studies similar to the current study's objectives were identified initially, of which, five were excluded due

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to unavailability of the complete version of the articles. Overall, forty articles were selected based on the suitability with the current review objectives and analyzed. Keywords used in the search include COVID-19 and Lung cancer in the title alone only (viz. COVID-19 [ti] AND lung cancer [ti]). Articles published in English language only were included for the review. The collected information has been presented in the following sub-headings, namely COVID-19 and patients with lung cancer, what makes lung cancer patients vulnerable, proposed recommendations, management of COVID-19-infected lung cancer patients, implications for practice, and implications for research.

CORONAVIRUS DISEASE-2019 AND PATIENTS WITH LUNG CANCER

It has been estimated that patients with lung cancer will have a significantly higher risk of an adverse outcome, if they acquire COVID-19 infection.^[3-5] Patients with lung cancer are usually prone to adverse outcomes attributed to COVID-19 infection because of old age, presence of different co-morbidities, positive history of smoking, and potential damage induced due to lung cancer.^[3-7] Further, the immunosuppression produced by the anticancer drugs also increases the propensity of development of COVID-19-associated complications.^[4-9] Moreover, it has been reported that among all types of cancers, patients with lung cancers have the highest rate of COVID-19 infection.^[6,10] The findings of a study done among lung cancer patients who were subsequently infected with COVID-19 revealed that 78% of the lung cancer patients required hospitalization, whereas almost 36% of the patients succumbed to the complications of the infection.^[11]

WHAT MAKES LUNG CANCER PATIENTS VULNERABLE?

We must take into account the fact that due to the imposition of lockdown and restriction on the movement of people, the well being of lung cancer patients is clearly affected, if they acquire the COVID 19 infection.^[11-14] Owing to the COVID-19 pandemic, regular screening activities for the detection of lung cancer have been interrupted, as most of the hospitals are taking care of COVID-19 patients and are often overwhelmed.^[15-17] There is an immense need to initiate screening activities at the earliest, else we will soon find ourselves managing large number of patients with advanced stages of lung cancer.^[16,18]

Owing to the imposed lockdown and interruption in the delivery of routine health-care services, the services aimed for diagnosis, treatment, and follow-up of lung cancer patients have been severely affected.^[19-23] In fact, the findings of a study have identified specific delays in terms of extension in the time span between intravenous treatments which require hospitalization, decrease in the number of treatment cycles, shifting to oral treatment as intravenous therapy is not possible, etc.^[24-28] All these interruptions and delay have significantly impacted the prognosis of lung cancer patients and have even accounted for an impairment in the quality of life of the patients.^[19-28]

The ongoing COVID-19 pandemic has compelled hospital authorities to reorganize their hospital wards and patient care-related activities, in order to accommodate the increasing number of people infected with the novel viral infection.^[20,21,23,24] This reallocation of the available logistics and resources has significantly affected the nature of care offered to people with chronic diseases, including patients with lung cancer.^[24-27,29] In fact, oncologists have had to prioritize patients that need immediate attention and those whose care can be delayed till COVID-19 situation improves in the local region.^[26-29] In other words, COVID-19 infection has started to influence even the decision-making among health-care professionals and has complicated the overall picture.^[29]

The findings of a study done in Italy among lung cancer patients revealed that owing to the sudden exacerbation of cases and increasing number of deaths among COVID-19-infected patients, there was a sense of immense fear among people living with lung cancer.^[30] On a similar note, a significant amount of stress was reported among another cohort of lung cancer patients as they were extremely worried about the acquisition of infection and that they would not be able to receive the treatment for their malignancy as the health-care delivery system was overwhelmed.^[31]

PROPOSED RECOMMENDATIONS

The national bodies across multiple nations have released a set of recommendations for both prevention and optimal management of COVID-19 infection among known lung cancer patients.^[32-36] The most important strategy is to minimize the exposure of lung cancer patients to hospitals so that the risk of acquiring the infection can be significantly minimized. This essentially calls for the need to strengthen tele-consultation in health-care facilities. However, patients who definitely require follow-up should be managed in those settings, which do not entertain COVID-19 patients.^[16,28,33] The opportunity of clinical interaction should also be utilized to screen lung cancer patients for the potential presence of clinical features suggestive of COVID-19 infection and to assess the presence of therapy-induced adverse reactions.^[13,16,28,35,36]

MANAGEMENT OF CORONAVIRUS DISEASE-2019-INFECTED LUNG CANCER PATIENTS

From the management perspective, it has been advocated to not administer immunosuppressive chemotherapeutic drugs and that even if administered, it should be done in a health-care facility with close monitoring for adverse effects.^[33,37] The COVID-19-infected lung cancer patients who need treatment for lung cancer should be isolated for a period of 2 weeks before the start of treatment either at home or in hospital settings.^[14,33] The recommendations remain same for even surgical interventions. Health professionals should exercise all precautions to interrupt transmission of the COVID-19 infection, and all elective procedures should be deferred.^[38-40] The decision to administer radiotherapy should be taken by

a set of experts and should be offered close to the patient's residence in a non-COVID-19 health-care establishment, to avoid prolonged travel.^[33,41] We must realize that the entire task of management of cancer patients during the ongoing COVID-19 pandemic is a critical issue, that will essentially require a multi-faceted approach, involving active collaboration between different stakeholders.^[42]

IMPLICATIONS FOR PRACTICE

The COVID-19 pandemic has emerged as a major challenge for health professionals, and it is quite essential for them to safeguard the vulnerable population groups. It is the need of the hour to advise patients with lung cancer to take extreme precautions and avoid all unnecessary exposure or social gatherings.^[20,21] Standard strategies to prevent acquisition of the infection, namely periodic hand washing, use of face masks, and following respiratory hygiene, should be strictly adhered.^[21,23] All known patients with lung cancer should avoid visits to hospital and, whenever they visit, the health-care professionals should evaluate them for the symptoms of COVID-19 infection.^[22-25]

IMPLICATION FOR RESEARCH

As the infection is a novel viral infection, a lot needs to be still understood about the interactions between COVID-19 and lung cancer. There is a need to intensify research activities to formulate correct management plan for patients with lung cancer at different stages.^[34,35,39] The available evidence signifies the role of smoking in producing a negative outcome and thus it can be further explored. Further, significant insight is required to understand the outcome of different therapeutic interventions on the prognosis of patients and thus all research should aim to improve the survival and well-being of patients.^[37-41] There is a significant scope to employ tools such as social media, telemedicine, and triage using phones for initiating the process of screening patients with lung cancer.^[42]

CONCLUSION

The COVID-19 pandemic has significantly affected patients with lung cancer. Owing to the emergence of evidence of poor prognosis of infection among lung cancer patients, there is an indispensable need to adopt a multidisciplinary treatment approach. The aim should be to prevent the acquisition of infection, and to ensure provision of a timely, adequate, and rational line of management to these patients when infected with COVID-19.

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Conflicts of interest

There are no conflicts of interest.

REFERENCES

- World Health Organization. Weekly Epidemiological Update on COVID-19 – 15 June 2021; 2021. Available from: <https://www.who.int/>
- World Health Organization. Cancer – Key Facts; 2021. Available from: <https://www.who.int/news-room/fact-sheets/detail/cancer>. [Last accessed on 2021 Jun 21].
- Luo J, Rizvi H, Preeshagul IR, Egger JV, Hoyos D, Bandlamudi C, *et al.* COVID-19 in patients with lung cancer. *Ann Oncol* 2020;31:1386-96.
- Rogado J, Pangua C, Serrano-Montero G, Obispo B, Marino AM, Pérez-Pérez M, *et al.* Covid-19 and lung cancer: A greater fatality rate? *Lung Cancer* 2020;146:19-22.
- Nie L, Dai K, Wu J, Zhou X, Hu J, Zhang C, *et al.* Clinical characteristics and risk factors for in-hospital mortality of lung cancer patients with COVID-19: A multicenter, retrospective, cohort study. *Thorac Cancer* 2021;12:57-65.
- Dai MY, Chen Z, Leng Y, Wu M, Liu Y, Zhou F, *et al.* Patients with lung cancer have high susceptibility of COVID-19: A retrospective study in Wuhan, China. *Cancer Control* 2020;27:1073274820960467.
- Passaro A, Bestvina C, Velez Velez M, Garassino MC, Garon E, Peters S. Severity of COVID-19 in patients with lung cancer: Evidence and challenges. *J Immunother Cancer* 2021;9:e002266.
- Lei H, Yang Y, Zhou W, Zhang M, Shen Y, Tao D, *et al.* Higher mortality in lung cancer patients with COVID-19? A systematic review and meta-analysis. *Lung Cancer* 2021;157:60-5.
- Garassino MC, Whisenant JG, Huang LC, Trama A, Torri V, Agustoni F, *et al.* COVID-19 in patients with thoracic malignancies (TERAVOLT): First results of an international, registry-based, cohort study. *Lancet Oncol* 2020;21:914-22.
- Calles A, Aparicio MI, Alva M, Bringas M, Gutierrez N, Soto J, *et al.* Outcomes of COVID-19 in patients with lung cancer treated in a tertiary hospital in Madrid. *Front Oncol* 2020;10:1777.
- Guan WJ, Ni ZY, Hu Y, Liang WH, Ou CQ, He JX, *et al.* Clinical characteristics of coronavirus disease 2019 in China. *N Engl J Med* 2020;382:1708-20.
- Addeo A, Obeid M, Friedlaender A. COVID-19 and lung cancer: Risks, mechanisms and treatment interactions. *J Immunother Cancer* 2020;8:e000892.
- Lung Cancer Study Group, Chinese Thoracic Society; Chinese Medical Association; Chinese Respiratory Oncology Collaboration. Expert recommendations on the management of patients with advanced non-small cell lung cancer during epidemic of coronavirus disease 2019 (Trial version). *Zhonghua Jie He He Hu Xi Za Zhi* 2020;43:297-301.
- Ömeroğlu Şimşek G. Lung cancer management in COVID-19 pandemic. *Turk Thorac J* 2020;21:340-4.
- Van Haren RM, Delman AM, Turner KM, Waits B, Hemingway M, Shah SA, *et al.* Impact of the COVID-19 pandemic on lung cancer screening program and subsequent lung cancer. *J Am Coll Surg* 2021;232:600-5.
- Leong TL. Delayed access to lung cancer screening and treatment during the COVID-19 pandemic: Are we headed for a lung cancer pandemic? *Respirology* 2021;26:145-6.
- Byrne SC, Jacobson FL, Hammer MM, Dyer DS. Deferral and resumption of lung cancer screening after COVID-19 surge: Patient perspectives from two institutions. *J Am Coll Radiol* 2021;18:601-4.
- Aujayeb A. A note on lung cancer in the COVID-19 era. *Respirology* 2021;26:510-1.
- Passaro A, Peters S, Mok TSK, Attili I, Mitsudomi T, de Marinis F. Testing for COVID-19 in lung cancer patients. *Ann Oncol* 2020;31:832-4.
- Shankar A, Saini D, Bhandari R, Bharati SJ, Kumar S, Yadav G, *et al.* Lung cancer management amidst COVID-19 pandemic: Hope lives here. *Lung Cancer Manag* 2020;9:LMT33.
- Araujo-Filho JA, Normando PG, Melo MD, Costa AN, Terra RM. Lung cancer in the era of COVID-19: What can we expect? *J Bras Pneumol* 2020;46:e20200398.
- Aran V, De Marchi P, Zamboni M, Ferreira CG. Dealing with lung cancer in the COVID-19 scenario (A review). *Mol Clin Oncol* 2021;14:27.
- Gourd E. Lung cancer control in the UK hit badly by COVID-19 pandemic. *Lancet Oncol* 2020;21:1559.
- Wu L, Zhang C, Zhao X. The impact of COVID-19 pandemic on lung cancer community. *World J Oncol* 2021;12:1-6.

25. Sha Z, Chang K, Mi J, Liang Z, Hu L, Long F, *et al.* The impact of the COVID-19 pandemic on lung cancer patients. *Ann Palliat Med* 2020;9:3373-8.
26. Fujita K, Ito T, Saito Z, Kanai O, Nakatani K, Mio T. Impact of COVID-19 pandemic on lung cancer treatment scheduling. *Thorac Cancer* 2020;11:2983-6.
27. Baldotto C, Gelatti A, Accioly A, Mathias C, Mascarenhas E, Carvalho H, *et al.* Lung cancer and the COVID-19 pandemic: Recommendations from the Brazilian Thoracic Oncology Group. *Clinics (Sao Paulo)* 2020;75:e2060.
28. Bakhribah H, Zeitouni M, Daghistani RA, Almaghraby HQ, Khankan AA, Alkattan KM, *et al.* Implications of COVID-19 pandemic on lung cancer management: A multidisciplinary perspective. *Crit Rev Oncol Hematol* 2020;156:103120.
29. Calabrò L, Peters S, Soria JC, Di Giacomo AM, Barlesi F, Covre A, *et al.* Challenges in lung cancer therapy during the COVID-19 pandemic. *Lancet Respir Med* 2020;8:542-4.
30. Catania C, Spitaleri G, Del Signore E, Attili I, Radice D, Stati V, *et al.* Fears and perception of the impact of COVID-19 on patients with lung cancer: A mono-institutional survey. *Front Oncol* 2020;10:584612.
31. Albano D, Feraca M, Nemesure B. An assessment of distress levels of patients undergoing lung cancer treatment and surveillance during the COVID-19 pandemic. *J Nurse Pract* 2021;17:489-91.
32. Printz C. New guidance for treating patients with lung cancer and COVID-19. *Cancer* 2020;126:3173.
33. Wang L, Jiang M, Qu J, Zhou N, Zhang X. Clinical management of lung cancer patients during the outbreak of COVID-19 epidemic. *Infect Agent Cancer* 2020;15:56.
34. Singh AP, Berman AT, Marmarelis ME, Haas AR, Feigenberg SJ, Braun J, *et al.* Management of lung cancer during the COVID-19 pandemic. *JCO Oncol Pract* 2020;16:579-86.
35. Xu Y, Liu H, Hu K, Wang M. Clinical recommendations on lung cancer management during the COVID-19 pandemic. *Thorac Cancer* 2020;11:2067-74.
36. Wang A, Chang SH, Kim EJ, Bessich JL, Sabari JK, Cooper B, *et al.* Dynamic management of lung cancer care during surging COVID-19. *Front Surg* 2021;8:663364.
37. Haineala B, Zgura A, Badiu DC, Iliescu L, Anghel RM, Bacinschi XE. Lung cancer, COVID-19 infections and chemotherapy. *In Vivo* 2021;35:1877-80.
38. Fiorelli S, Massullo D, Ibrahim M, Piccioni F, Andreotti C, Vanni C, *et al.* Perspectives in surgical and anaesthetic management of lung cancer in the era of coronavirus disease 2019 (COVID-19). *Eur J Cardiothorac Surg* 2020;58:676-81.
39. Merritt RE, Kneuert PJ. Considerations for the surgical management of early stage lung cancer during the COVID-19 pandemic. *Clin Lung Cancer* 2021;22:156-60.
40. Lareiro S, Guerra M. COVID-19: Crisis management in lung cancer surgery. *Rev Port Cir Cardiorac Vasc* 2020;27:75.
41. Liao Z, Rivin Del Campo E, Salem A, Pang Q, Liu H, Lopez Guerra JL. Optimizing lung cancer radiation treatment worldwide in COVID-19 outbreak. *Lung Cancer* 2020;146:230-5.
42. de Marinis F, Attili I, Morganti S, Stati V, Spitaleri G, Gianoncelli L, *et al.* Results of multilevel containment measures to better protect lung cancer patients from COVID-19: The IEO model. *Front Oncol* 2020;10:665.