Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. The COVID-19 resource centre is hosted on Elsevier Connect, the company's public news and information website.

Elsevier hereby grants permission to make all its COVID-19-related research that is available on the COVID-19 resource centre - including this research content - immediately available in PubMed Central and other publicly funded repositories, such as the WHO COVID database with rights for unrestricted research re-use and analyses in any form or by any means with acknowledgement of the original source. These permissions are granted for free by Elsevier for as long as the COVID-19 resource centre remains active.
Cancer pain treatment during the COVID-19 pandemic: institutional recommendations

Angela Maria Sousa, Thiago Ramos Grigio, Hazem Adel Ashmawi, Ulysses Ribeiro Júnior

Anestesia, Hospital das Clínicas HCFMUSP, Faculdade de Medicina, Universidade de São Paulo, São Paulo, SP, BR.

Sousa AM, Grigio TR, Ashmawi HA, Ribeiro Junior U. Cancer pain treatment during the COVID-19 pandemic: institutional recommendations. Clinics. 2020;75:e2208

1. Outpatient appointments: full consideration should be given to minimize patients congregating in a waiting room. The use of telemedicine is recommended for follow-up of outpatients (5,6).

2. In-hospital visits: to preserve health resources and protective equipment, it is considered essential to reduce the number of people examining the patients. Specialists’ consultations should be limited to the essential. When the interventional procedure is indicated, the pain specialist should examine the patient (5,6).

3. During clinical evaluation, the pain specialist should use surgical masks and gloves. For high-risk patients, professionals should protect themselves by wearing particulate-filtering respirators (N-95).

4. Individuals at high risk of COVID-19 infection should be tested before hospitalization (7) within three to five days before the procedure. Currently, with community dissemination, all cases can be suspected positive for COVID-19, even asymptomatic patients.

5. Unlike patients with non-oncological pain (5,6), interventional pain procedures can never be postponed. Cancer patients are usually at risk of worsening their clinical condition and sometimes such procedures are the best option to improve their quality of life.

6. During the interventional procedure, it is recommended that individuals ought to have full protective garments, including an N95 mask, ocular protection, and double gloves. Ensure that patients wear a surgical mask besides usual surgical gowns. Further, ensure that the fluoroscopy and ultrasound devices have protective covers. Additionally, reduce the number of people present during the procedure (5,6). A negative pressure operation room should be utilized for performing the procedure.

7. Pain procedures can be classified (5,6) as
   a. Urgent Procedures: intrathecal pump refill or malfunctioning of neurostimulators; intrathecal catheter infection.
   b. Semi-urgent procedures: refractory cancer pain; patients hospitalized due to pain; suspected opioid abuse.

8. If there is a need for hospitalization for an outpatient procedure, RT-PCR for SARS CoV2 and chest tomography should be performed (7). The patient should be kept hospitalized for the shortest duration as possible.

 Therapeutic recommendations:

1. Corticosteroids: Steroids can suppress the immune system and are related to infections, including pneumonia (8).
The injection of intra-articular steroids is associated with an increased risk for influenza infection (9). Following lumbar facet joint injections, cortisol levels are suppressed for an average of 4.4 days (10). Although COVID-19 induces an exaggerated immune response, steroids are only recommended for refractory shock (11). One should consider the risk/benefit of steroid injections and reduce the dose, especially in high-risk patients during the current COVID-19 pandemic (5,6).

2. Non-steroidal anti-inflammatory drugs (NSAIDs): At the beginning of the spread of the SARS-CoV-2 infection, European doctors indicated the non-use of ibuprofen or another NSAID, due to the risk of increasing levels of angiotensin-converting enzyme (ACE); thus, worsening COVID-19 (12). However, these results have not been proven. It should be noted that NSAIDs can mask some early symptoms of the disease, such as fever and myalgia (5).

3. Assess the risk/benefit of administering opioids. Opioids act on the hypothalamic/pituitary/adrenal (HHA) axis and activate the sympathetic nervous system (SNS). The SNS innervates lymphoid organs, such as the spleen, and this activation induces the release of biological amines that suppress the proliferation of splenic lymphocytes and the cytotoxicity of NK cells (13). Additionally, the prolonged use of opioids increases the activity of HHA and the production of glucocorticoids, which also decreases the cytotoxicity of NK cells (14). On the other hand, pain itself is immunosuppressive, and not prescribing opioids for the possibility of immunosuppression can be even more devastating.

4. Interventional procedures reduce opioid consumption and improve the quality of analgesia (4). However, most invasive procedures for cancer patients are performed in the inpatient regimen, which would increase their exposure to infection. The best option is to use common sense and evaluate case by case, especially during board discussions.

Cancer patients are immunocompromised and more susceptible to infections than the general population. These patients are older, have higher angiotensin-converting enzyme-2 (ACE2) expression, and more comorbidities (15). They are at higher risk of adverse outcomes (16), including intensive care admission, a requirement for mechanical ventilation, or death (16). Moreover, these patients are twice more likely to be diagnosed with COVID-19 than the general population (17,18).

A pragmatic approach is required when deciding whether to offer interventional therapies for treating cancer pain. The potential benefits and possible risks need to be considered in a scenario where social isolation and confinement at home are guidelines established by global health entities (19). Neuroablation can provide long-term pain control and should be considered for treating severe cancer pain (3).

Therefore, the implementation and optimization of the pain control protocol described above would intervene positively in the quality of life of our patients, minimizing the risks during the COVID-19 pandemic.

REFERENCES

1. van den Beuken-van Everdingen MH, Hochstenbach LM, Joosten EA, Tjan-Heijnen VC, Janssen DJ. Update on Prevalence of Pain in Patients With Cancer: Systematic Review and Meta-Analysis. J Pain Symptom Manage. 2016;51(6):1070-1090.e9. https://doi.org/10.1016/j.jpainsymman.2015.12.340

2. Bruea E, Kim HN. Cancer pain. JAMA. 2003;290(18):2476-9. https://doi.org/10.1001/jama.290.18.2476

3. Aljuboori Z, Burke W, Meyer K, Williams B. Cost analysis of cordotomy and intrathecal pain pump placement for refractory cancer pain. Surg Neurol Int. 2020;11:72. https://doi.org/10.25259/SNI_15_2020

4. Thapa D, Rastogi V, Ahuja V. Cancer pain management-current status. J Anaesthesiol Clin Pharmacol. 2011;27(2):162-8. https://doi.org/10.4103/0970-9185.81820

5. Shantha H, Strand NH, Provenzano DA, Lobo CA, Eldabe S, Bhatia A, et al. Caring for patients with pain during the COVID-19 pandemic: consensus recommendations from an international expert panel. Anesthesiology. 2020;132(7):935-44. https://doi.org/10.1097/ANE.0000000000002366

6. Cohen SP, Baber ZB, Buvanendran A, McLean BC, Chen Y, Hooten WM, et al. Pain Management Best Practices from Multispecialty Organizations During the COVID-19 Pandemic and Public Health Crises. Pain Med. 2020;21(7):1331-46. https://doi.org/10.1093/pm/npaa227

7. Chen ATC, Moniz CMV, Ribeiro-Júnior U, Diz MDPE, Salvajoli JV, Da Conceição Vasconcelos KGM, et al. How should health systems prepare for the evolving COVID-19 pandemic? Reflections from the perspective of a Tertiary Cancer Center. Clinics. 2020;75:1864. https://doi.org/10.6061/clinics/2020/e1864

8. Tashkin DP, Strange C. Inhaled corticosteroids for chronic obstructive pulmonary disease: what is their role in therapy? Int J Chron Obstruct Pulmon Dis. 2018;13:2587-601. https://doi.org/10.2147/COPD.S172240

9. Sytsma TT, Greenland LK, Greenland LS. Joint Corticosteroid Injection Associated With Increased Influenza Risk. Mayo Clin Proc Innov Qual Outcomes. 2018;2(2):194-8. https://doi.org/10.1016/j.mayocpiqo.2018.01.005

10. Dickson RR, Reid JM, Nicholson WT, Lamer TJ, Hooten WM. Corticosteroid and Cortisol Serum Levels Following Intra-articular Triamcinolone Lumbar Facet Joint Injections. Pain Pract. 2018;18(7):864-70. https://doi.org/10.1111/papr.12686

11. Alhazzani W, Moller MH, Arabi YM, Loeb M, Gong MN, Fan E, et al. Surviving Sepsis Campaign: guidelines on the management of critically ill adults with Coronavirus Disease 2019 (COVID-19). Intensive Care Med. 2020;46(5):854-87. https://doi.org/10.1007/s00134-020-08622-5

12. Day M. Covid-19: ibuprofen should not be used for managing symptoms, say doctors and scientists. BMJ. 2020;368:m1086. https://doi.org/10.1136/bmj.m1086

13. Fecho K, Maslonek KA, Dykstra LA, Lysle DT. Evidence for sympathetic and adrenal involvement in the immunomodulatory effects of acute morphine treatment in rats. J Pharmacol Exp Ther. 1996;272(2):633-45.

14. Mellon RD, Bayer BM. Evidence for central opioid receptors in the immunomodulatory effects of morphine: review of potential mechanism(s) of action. J Neuroimmunol. 1998;80(1-2):19-28. https://doi.org/10.1016/S0165-7240(98)00217-8

15. Extermann M. Measuring comorbidity in older cancer patients. Eur J Cancer. 2000;36(4):453-71. https://doi.org/10.1016/s0959-8049(99)00319-6

16. Liang W, Guan W, Chen R, Wang W, Li J, Xu Ke, et al. Cancer patients in SARS-CoV-2 infection: a nationwide analysis in China. Lancet Oncol. 2020;21(3):335-7. https://doi.org/10.1016/S1470-2245(20)30096-6

17. Gosaín R, Abdou Y, Singh A, Rana N, Puzanov I, Ernstoff MS. COVID-19 and Cancer: A Comprehensive Review. Curr Oncol Rep. 2020;22(5):53. https://doi.org/10.1007/s11912-020-09334-7

18. Sidaway P. COVID-19 and cancer: what we know so far. Nat Rev Clin Oncol. 2020;17(6):336. https://doi.org/10.1038/s41571-020-03636-2

19. World Health Organization. Coronavirus disease (COVID-19) pandemic. Available from: https://www.who.int/emergencies/diseases/novel-coronavirus-2019