

COVID-19 and Interventional Pain Practice

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ABSTRACT

In December 2019, an outbreak of COVID-19 occurred in Wuhan, China, which is caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). The infection became pandemic within next few weeks. The literature regarding interventional pain practice with respect to COVID-19 is scarce. But pathological and structural features of SARS-CoV-2 and SARS-CoV resemble each other and hence long-term sequelae, with respect to chronic pain, similar to severe acute respiratory syndrome (SARS) can be expected with COVID-19. Also, on literature search, we could not find any recommendations or guidelines for interventional pain practice. However, American Society of Regional Anesthesia and Pain Medicine (ASRA) and European Society of Regional Anesthesia and Pain Therapy (ESRA) have jointly put forth the recommendations for neuroaxial and peripheral nerve blocks for current pandemic situation. We are of opinion that with certain modifications these recommendations can be extrapolated for practice of interventional pain management. We propose the recommendations for interventional pain practice for current pandemic situation of COVID-19.

Keywords: Chronic Pain, COVID-19, Interventional pain practice, Recommendations.

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In December 2019, there occurred an outbreak of a new unknown pathogen in Wuhan, China.¹ Over the next few weeks, infection became widespread sparing very few countries in the world. World Health Organization on February 11, 2020, officially named it as coronavirus disease 2019, abbreviated as COVID-19.² COVID-19 is caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), also known as 2019 novel coronavirus.¹ Most of the infected patients resolve acutely and have mortality rate of 2–3.85%.^{1,3}

Severe acute respiratory syndrome coronavirus 2 primarily affects the respiratory system, but other organ systems can also get affected. Interstitial mononuclear inflammatory infiltrates have been demonstrated in lungs and liver in autopsy findings of a COVID-19 patient.¹ In COVID-19, there is an increase in inflammatory cytokines and chemokines such as interleukin (IL)-1, IL-2, IL-6, IL-7, IL-8, granulocyte colony stimulating factor, interferon-gamma-inducible protein 10, monocyte chemoattractant protein 1, macrophage inflammatory protein 1-alpha, tumor necrosis factor-alpha, and ferritin.^{1,4} Also peripheral blood examination of COVID-19 patients showed a significant reduction in the number of but hyperactivation of CD4 and CD8 T cells. The hyperactivation of T cells causes severe immune injury.¹

The pathological features of COVID-19 and of other coronavirus diseases like severe acute respiratory syndrome (SARS) and Middle Eastern respiratory syndrome resemble greatly.¹ Severe acute respiratory syndrome outbreak occurred in 2003 and was caused by SARS-CoV. Moreover, SARS-CoV and SARS-CoV-2 have structural similarities.⁵ Based on this, we postulate that the long-term sequelae of SARS can also occur in survivors of COVID-19.

Long-term sequelae of SARS have been documented in the form of neuromuscular disease. Lee N et al. suggested myopathy in SARS patient as a common sequelae.⁶ In SARS patients who experienced progressive myalgia and weakness, a spectrum of myopathy was demonstrated.⁷ In SARS survivors with chronic pain, raised creatinine kinase levels and muscle weakness was present which is suggestive of myositis or it can be adverse effect of corticosteroid administration as a part of treatment for SARS.⁸ The chronic myofascial pain was more commonly arising from those muscles which are directly or indirectly related to respiration.⁸

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Also neurological sequelae, though rare, have been documented in SARS patients with paresthesia being a common complaint.^{9,10} Apart from this, SARS patients also have been presented with the chronic widespread nonspecific pain and musculoskeletal pain similar to that of chronic fatigue syndrome and fibromyalgia syndrome; it is postulated to be a result of chronic post-inflammatory central nervous system pathology that adversely affects sleep, pain sensitivity, and energy.¹¹ Herridge et al. also reported pain; reduced vitality; and impaired physical, mental, and social functioning in 1 year outcome in SARS survivors.¹²

Considering the long-term sequelae of SARS-CoV, we may encounter similar sequelae of SARS-CoV-2, and as pain medicine specialists, we should be aware and ready to manage such health-care issues if at all presented in clinical practice. We are of the opinion that interventional pain procedures in COVID-19 survivors who are no more infectious can be done by adhering to routine guidelines and recommendations. However, this should not be applicable in the current pandemic situation.

Evidence shows that there is human-to-human transmission of SARS-CoV-2 and is mainly transmitted through respiratory droplets generated by coughing, sneezing, or exhalation. Transmission also occurs by touching—direct touch or touch to contaminated surfaces or objects and then touching own mouth, nose, or possibly eyes. The risk of transmission is most among close contact with a suspected or confirmed COVID-19 patient or who care for such

patients.¹³ Moreover, we should be aware that asymptomatic incubation period ranges from 1 to 14 days.¹⁴

So, to avoid transmission/exposure to and safeguard of the health-care workers, use of personal protective equipment (PPE) is necessary. Personal protective equipment includes mask, eye protection (goggle and face shield), surgical gown, head cover, shoe cover, and gloves. N95 masks or similar powered air-purifying respirator is desirable. Nitrile gloves are preferred over latex gloves and non-powdered gloves are preferred over powdered gloves.¹³ Apart from PPE, respiratory hygiene and frequent hand hygiene should be performed. Hand hygiene should be performed before putting on and removing PPE.¹⁵ In an experiment to assess stability of SARS-CoV-2, it has been shown that it is more stable on plastic and stainless steel than on copper and cardboard. In that experiment, no viable virus was found on copper and cardboard after 4 hours and 24 hours, respectively, whereas it was detected up to 72 hours over plastic and stainless steel.¹⁶ Surface disinfection of health-care facility hence is necessary. It can be effectively done by 62–71% ethanol, 0.5% hydrogen peroxide, or 0.1% sodium hypochlorite with 1 minute exposure time. Also alcohol-based hand-rubs—based on 80% ethanol or 75% 2-propanol—are effective to decontaminate hands.¹⁷

We searched the literature for recommendations or guidelines for the interventional pain management during the current pandemic situation of COVID-19 but could not find any till the time of writing this article. However, a joint statement for practice of neuroaxial anesthesia and peripheral nerve blocks for current pandemic situation is given by American Society of Regional Anesthesia and Pain Medicine (ASRA) and European Society of Regional Anesthesia and Pain Therapy (ESRA).¹⁸ We are of opinion that with certain modifications, these recommendations can be extrapolated for practice of interventional pain management.

We propose following recommendation for interventional pain practice:

- To reduce the risk of COVID-19 and to conserve the capacity of health-care system, all the elective interventional pain management procedures (henceforth called interventional procedure) should be postponed.
- If the interventional procedure is deemed necessary, then ascertain if the patient is COVID-19 negative, COVID-19 positive, or suspected to be positive or under investigation.
- If COVID-19 community spread is significant, all patients may be presumed to be COVID-19 positive.¹⁸
- If patient is COVID-19 negative, not under investigation, or not suspected to be positive, then routine guidelines should be adhered to.¹⁸
- If patient is COVID-19 positive or under investigation or suspected to be positive, PPE should be used.¹³
- Triple-layer medical mask should be worn by all patients.^{13,18}
- Interventional procedure should be performed in operating room and should be avoided to be performed in outpatient procedure room.¹⁸
- The most experienced personnel should perform the interventional procedure.
- Minimum number of personnel should be present in operating room during the interventional procedure.¹⁸
- All the equipment such as fluoroscope, ultrasound, radiofrequency generator and its cables and probes, etc., should be well protected from contamination using plastic covers.

- The donning of PPE should occur before entering the room.¹⁸
- Considering the shortage of N95 or similar respirator, it can be avoided, provided that health-care worker is not in close proximity to the face of the patient or have no risk of getting exposed to oro-nasal secretions.¹³
- Double glove for personnel involved in performing the interventional procedure should be used.¹³
- As thrombocytopenia can occur in COVID-19 patients, interventional pain specialist should be aware of the platelet counts.¹⁸
- Use of paper drapes, if available should be preferred over plastic drapes as SARS-CoV-2 particles are viable for longer time on plastic.¹⁶
- Sedation should be avoided to negate the risk of any respiratory compromise requiring supplemental oxygen.¹⁸
- If oxygen supplementation is required, oxygen mask should be used with minimal flow of supplemental oxygen; nasal prongs should be avoided.¹⁸
- To reduce the droplet dispersion, triple-layer medical mask can be used over oxygen mask.
- Interventional procedure related to or in close proximity to oral cavity or nasal cavity should be avoided as there is higher risk of aerosol generation during such procedures.¹⁸
- Interventional procedure involving the administration of platelet-rich plasma should be avoided as there is higher risk of injecting viremic plasma.
- Interventional procedure that may interfere with respiration should be avoided, or if necessary to perform, one should be very cautious.¹⁸
- The risk-and-benefit ratio should be weighed if corticosteroid is needed to be administered considering the risk of immunosuppression.
- Post-procedure patient should be shifted to COVID-19-designated area of the hospital. If monitoring is necessary before shifting to the designated area, it should be done in the operating room only.¹⁸
- Proper disinfection of reusable equipment and operating room must be done according to the regional and institutional guidelines.¹⁷
- Donning and doffing of PPE should be done according to the standard guidelines given by center for disease control and prevention.¹⁹ Space with different designated areas for donning and doffing and also adequate time should be provided for the same.¹⁹
- At the end of the interventional procedure, special care should be taken to dispose the consumables including PPE so as to avoid the risk of transmission.¹⁸
- All these recommendations are in addition to the routine guidelines and recommendation which one must comply.

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