

Transdermal Fentanyl patch: An approach to enhance tolerance of conscious proning in COVID-19 patients

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ARTICLE INFO

Keywords:

Transdermal fentanyl patch
conscious proning
COVID-19
tolerance
enhance

DOI: 10.5055/jom.2020.0576

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ABSTRACT

The COVID-19 ARDS appears to have worse outcomes than ARDS from other causes. It is a predictable serious complication and the key strategy is to maintain oxygenation. Adopting the prone position for conscious COVID-19 patients requiring basic respiratory support, is shown to benefit patients in terms of improving oxygenation, reducing the need for invasive ventilation and potentially even reducing mortality. Cough and myalgia are the common and most distressing symptoms seen in conscious COVID-19 patients which can impair tolerance to awake proning. Modified awake proning with application of transdermal fentanyl patch (TFP) can improve the compliance to conscious proning in COVID-19 patients.

The COVID-19 Adult Respiratory Distress Syndrome (ARDS) appears to have worse outcomes than ARDS from other causes. It is a predictable serious complication and the key strategy is to maintain oxygenation.¹ Prone ventilation for ARDS patients has been used for many years to achieve physiological benefits such as improvement of ventilation-perfusion mismatching, recruitment of dependent lung regions, and enhanced postural drainage.² Preliminary data from patients with ARDS related to COVID-19 appear to show significant effectiveness of prone positioning in intubated patients. Moreover, previous studies have suggested that use of early prone positioning in combination with noninvasive ventilation (NIV) or high-flow nasal cannula (HFNC) can avoid the need for intubation in moderate to severe ARDS.³

Conscious patients are initially managed supine, a more comfortable and practical position but it can lead to atelectasis. Moreover, as the disease progresses, hypoxemia will become more evident. Adopting the prone position for conscious COVID-19 patients requiring basic respiratory support, is shown to benefit patients in terms of improving oxygenation, reducing the need for invasive ventilation and

potentially even reducing mortality.⁴ Unlike the proning in intubated ARDS patients which needs adequate preparation and labor-intensive teamwork, self-proning in alert patients is not only simple and easy, but is cost effective and can be achieved successfully by effective communication with the patient. Another advantage of early awake proning is that it can be performed anywhere, with no special equipment. It's worth noting that prone positioning could also be performed on room air or low-flow oxygen in resource limited contexts.⁵ Maneuvers that can safely improve oxygenation without additional resources are thus of immense value during a surge of COVID-19 patients. Moreover, in severe cases, awake proning can be combined with a variety of other oxygenation strategies like face masks, high-flow nasal cannula (HFNC) and noninvasive ventilation (NIV).³ It is arguably the single most versatile oxygenation strategy for COVID-19.

Generally, critically ill patients experience moderate to severe pain due to local and systemic inflammatory responses which are often distressing and frequently under-recognized. Analgesic are an important component of care for critically

ill patients. Opioids are the commonly used agents in ICU for sedation and pain management.⁶ Additionally, cough suppression is a part of the pharmacodynamic profile of opioids.⁷ Cough (68.6 percent) and myalgia (35.8 percent) are the common symptoms seen in COVID-19 patients and may reflect generalized inflammation and cytokine response.^{8,9} These have been noted to be distressing and painful especially in conscious critically ill patients which have impaired tolerance to awake proning.

We at our intensive care unit in Al-Adan Hospital, Kuwait, have modified conscious proning in COVID-19 patients by using Transdermal Fentanyl Patch (TFP). TFP has been used widely in acute and chronic pain management. It is a slow-release skin patch that steadily releases fentanyl into the bloodstream according to the dosage applied, plateauing in 15 hours and effective for 72 hours.¹⁰ After excluding any contraindication for fentanyl use, the purpose as well as the procedure of proning is explained to the patient. TFP (25-50 mcg/hr) is applied to the patient's anterior chest wall along with the oxygenation and hemodynamic monitors (noninvasive blood pressure cuff, ECG leads, and pulse oximeter). They are closely monitored for any adverse events especially CNS depression, hypoventilation, or hypotension. With this modification, a drastic improvement was noted, in the compliance to conscious proning with minimal side effects and it also facilitated in self-directed physiotherapy.¹¹

We suggest modified conscious pronation with TFP to be a safe and versatile strategy which can be conveniently used during this pandemic to reduce the burden on critical care units and potentially avoid invasive ventilation. However, the COVID-19 pandemic continues to the present, both challenges and opportunities for the health-care community to learn and improvise as we practice and research the optimal approach to manage these patients.

ACKNOWLEDGMENTS

We would like to thank Dr Huda Alfoudri (Head of the Department of Anesthesia, Critical Care, and Pain Management, Al Adan Hospital) for her continued support.

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