

Awake Prone Position in Acute Hypoxaemic Respiratory Failure



A study aimed to improve understanding of the impact of the awake prone position on the breathing patterns of patients with low oxygen levels. The researchers carried out a crossover trial examining how awake prone position use in patients with acute hypoxaemic respiratory failure affected their physiological responses.

The study involved 15 patients with acute hypoxaemic respiratory failure and $\text{PaO}_2/\text{FiO}_2 < 200$ mmHg. Study patients received high-flow nasal oxygen for one hour in supine position, followed by two hours in the prone position, and one more hour in the supine position. At the end of each phase, various measurements were taken, including arterial blood gases, inspiratory effort, transpulmonary driving pressure, respiratory rate, oesophageal pressure, tidal volume, end-expiratory lung impedance, lung compliance, airway resistance, time constant, dynamic strain, and pendelluft extent using electrical impedance tomography.

Compared to supine position, prone position led to increased $\text{PaO}_2/\text{FiO}_2$ levels and decreased respiratory rate. In the prone position, there was also an increase in inspiratory effort with similar simplified pressure–time product per minute and transpulmonary driving pressure. Prone position resulted in higher airway resistance and time constant. It also increased end-expiratory lung impedance, promoted tidal volume distribution towards the dorsal lung region without changing tidal volume size and lung compliance. This resulted in lower dynamic strain. The magnitude of pendelluft phenomenon remained consistent between prone and supine positions.

These findings show that prone position improves oxygenation, boosts end-expiratory lung impedance, and promotes the distribution of tidal volume to the lower lung regions without impacting VT size, transpulmonary driving pressure, lung compliance, and the extent of pendelluft phenomenon. Prone position also lowers the respiratory rate and increases inspiratory effort due to the positional rise in airway resistance and prolonged expiratory time. Given that high inspiratory effort is a key factor in causing self-inflicted lung injury, caution is advised when considering the use of the awake prone position in patients with intense inspiratory effort.

Source: [Critical Care](#)

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