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Research Article

A CASE OF MODS RECOVERED: BUT WEANING DIFFICULT

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ABSTRACT

Weaning had always been difficult in multiple organ damage with long term mechanical ventilation due to various reasons. We report a case of 42 years male, operated for intestinal obstruction that landed to multiple organ failure, but recovered and weaned off.

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INTRODUCTION

Unnecessary delay in withdrawing mechanical ventilation increases the likelihood of complications such as pneumonia, discomfort, and ventilator-induced lung injury, and increases cost. However, the value of removing the ventilator as soon as possible must be balanced against the risks of premature withdrawal, which include difficulty in reestablishing an artificial airway, ventilatory muscle fatigue, and compromised gas exchange[1]. Weaning becomes complicated when associated with multiple organ dysfunctions and patient had been mechanically ventilated for a long time. We describe how we managed a rexplored case of intestinal obstruction, who went to MODS, but recovered. Somehow, due to multiple reasons he became dependant on ventilator and weaned after a lot of trial.

Case Report

Jairam, 42 years male, an operated case of acute intestinal obstruction, resection and anastomosis done was shifted to SICU for ventilatory support and postoperative management. Patient had complains of abdominal pain since 3 days, was dehydrated, tachypnoic and hypotensive, diagnosed as acute intestinal obstruction, so was operated immediately under general anesthesia under ASA grade IIE. Patient was chronic alcoholic since 25 years and had jaundice 2 months back, managed medically. Intraoperatively, gangrenous bowel was found 25 cms to 75 cms from DJ junction. Resection of gangrenous bowel and anastomosis was done. Patient was supported with ionotropes and fluid, but cannot be extubated due to poor respiratory efforts and hemodynamic instability. Postoperatively, patient went into alcohol withdrawal, managed medically. Patient was on ventilator with ionotropic supports and then acquired ventilator associated pneumonia. Antibiotic according to sensitivity i.e. imepenem, covered with clindamycin and levofloxacin along with steroid started. Patient was kept sedated and paralysed electively. Slowly, patient started improving clinically and radiologically and was easily weaned off ionotropic and ventilatory support. Finally, patient was shifted to ward.

Two days after shifting, it was found that patient had developed leak at anastomotic site. So, patient was re-explored and primary closure of leak site was done. Patient could not be extubated and again shifted to SICU. But the situation started detoriating as he became drowsy, developed high grade fever, urine output decreased and ionotropic support increased. Coarse crepts developed all over chest and he required higher oxygen concentration for maintaining saturation. Again sample from blood and tracheostomy were sent for culture and sensitivity and this time it was acinatobacter species sensitive to piperacillin-tazobactam and gentamycin. Steroid and furosemide were also started. Patient started bleeding from tracheostomy site, haemoglobin and platelate were serially decreasing and reached to 7.4 and 45000 respectively. Two packed red blood cell along with four fresh frozen plasma and four platelates were transfused. Patient was kept in negative fluid balance for a few days. Aggressive chest physiotherapy was given. With these entire efforts patient started improving and supports decreased. Feeding from ryle's tube started.

Patient became stable again, but the only problem remained was inability to wean off him from ventilator. He had become ventilator dependant due to muscle weakness, altered respiratory mechanics, resolving ARDS and malnutrition. With initial failure of weaning, it was understood that there are many issues to be solved to wean off the patient. Patient was poor enough to bring total parental nutrition, oral feed

was started. Steroids were continued as adrenal suppression may be a reason. Nebulization with salbutamol and N-acetyl cystine were given. FiO2 was set to achieve just saturation above 90%. After 5 days, patient was put on SIMV mode. Slowly, respiratory rate was decreased to promote patient to breathe on his own. It took four more days to shift patient to CPAP mode with pressure support of 15 cm H2O and PEEP 10 cm. serially pressure support and PEEP 10 cm were decreased, but all got stuck at PSV 12 cm of H2O and PEEP 8 cm. Any decrease from here made patient uncomfortable and dyspnoic. Although, secretion had become clear, but the amount was a lot, so he required frequent suctioning. There was no improvement radiographically also. Spontaneous breathing trial was given every day in morning, but failed as patient became tachypnoic. This continued for three more days. Meanwhile a culture/sensitivity was sent, it was found that organism was klebsiella pneumonia resistant to piptaz and sensitive to imipenem, colistin and polimyxin. Imipenem was started, but it took three more days to respond. Further weaning was like two hours T-piece and 4four hours CPAP for 24 hours, then two hours T-piece and three hour CPAP, then two hour each T-piece and CPAP. After this when patient was tried to be kept on T-piece only, but he would demand ventilator support after a few hours for the difficulty in breathing and the fear of dying. Patient was counseled and explained his condition. He was mobilized out of his bed, although he was not able to stand even on his own. Next he was supplemented with a high flow oxygen device with a flow 15 litres and fiO2 of 40%. With the regular counseling, his family support and this high flow machine, he could be finally weaned off the ventilator and kept on T-piece for two more days with minimal oxygen support of 2 litres. Finally, he was comfortable at room air, breathing on his own and being stable.

DISCUSSION

There can be many reasons for weaning failure in long term ventilated patient. So for successful weaning, all the possible causes should be considered and treated. In an ICU set up, it's a team work. Contribution of doctor, staff and patient's relative, all are equally important.

Possible reasons in our case

CAUSE	MANAGEMENT[2]
Increased airway resistance	B2 agonist- bronchodilator Steroid- reduces inflammation PEEP- to prevent complete collapse
Basal atelectasis	Physiotherapy
Neuromuscular weakness	Early mobilization Antioxidants – Vitamin C& E Inspiratory muscle training
Reduced haemoglobin	Blood transfusion Iron and folic acid supplementation
Nutrition	Adequate oral intake Parenteral nutrition
Depression , anxiety	Anxiolytic Behavior therapy
Infection	Organism sensitive antibiotic Strict asepsis

Weaning must be individualized according to the patient. There is no fixed algorithm as each case is different. But the basics are same.

Selected Recommendations from the ACCP-SCCM-AARC Evidence-Based Weaning Guidelines Task Force[1]

Recommendation 1: Patients receiving mechanical ventilation for respiratory failure should undergo a formal assessment of discontinuation potential if the following criteria are satisfied:

1. Evidence of some reversal of the underlying cause of respiratory failure
2. Adequate oxygenation: PaO2/ FIO2 150–200 mm Hg, required PEEP 5–8 cm H2O, FIO2 0.4–0.5, and pH 7.25
3. Hemodynamic stability as defined by the absence of clinically important hypotension and requiring no vasopressors or only low-dose vasopressors (eg, dopamine or dobutamine 5-8 mg/kg/min)
4. Patient is able to initiate an inspiratory effort

The decision to use these criteria must be individualized. Some patients who do not satisfy all the criteria may, nevertheless, be ready for an attempt to discontinue mechanical ventilation.

Recommendation 2: Formal discontinuation assessments should be done during spontaneous breathing rather than while the patient is still receiving substantial ventilatory support. An initial brief period of spontaneous breathing can be used to assess the patient's ability to do a formal SBT.

Criteria to assess patient tolerance during SBT are the respiratory pattern, adequacy of gas exchange, hemodynamic stability, and subjective comfort. Patients who tolerate a 30–120 min SBT should promptly be considered for ventilator-discontinuation.

Recommendation 3: With patients whose ventilatory support has been successfully discontinued, the decision of whether to remove the artificial airway should be based on assessment of airway patency and the patient's ability to protect the airway.

Recommendation 4: If the patient fails an SBT, determine the reasons the patient continues to require ventilatory support. Once the reversible causes of failure are corrected an SBT should be performed every 24 h. Patients who fail SBT should receive a stable, non fatiguing, comfortable form of ventilatory support.

Recommendation 6: Weaning/discontinuation protocols designed for non physician clinicians should be developed and implemented by intensive care units. Protocols should aim to optimize sedation.

Recommendation 7: Critical care practitioners should be familiar with facilities in their communities or units in their hospital that specialize in managing patients who suffer prolonged ventilator-dependence, and practitioners should stay abreast of peer-reviewed reports from such units.

When medically stable enough for transfer, patients who have failed discontinuation attempts in the intensive care unit should be transferred to facilities that have demonstrated success and safety in accomplishing ventilator discontinuation.

Recommendation 8: Unless there is evidence of clearly irreversible disease (eg, high spinal cord injury, advanced amyotrophic lateral sclerosis), a patient who requires prolonged ventilatory support for respiratory failure should not be considered permanently ventilator-dependent until 3 months of weaning attempts have failed.

Recommendation 9*:* With a patient who requires prolonged ventilation the weaning should be slow-paced and should include gradually lengthening SBTs.

Finally the non invasive methods of oxygen delivery can also have a crucial role.

CONCLUSION

At present every step of weaning is supported by set of randomized trial[3]. Knowledge about physiology, basics of ventilation, existing comorbidites and resources available can help us to make the patient to breathe on his own after any kind of casualty.

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