

Short Article

Mechanical Ventilation: Effects on Various Systems and General Care of Patients

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Abstract: One of the main interventions offered in an Intensive Care Unit (ICU) is advanced respiratory support. An understanding of the indications and effects of mechanical ventilation is therefore essential for anyone working in this environment. Due to the homeostatic interactions between the lungs and other body systems, mechanical ventilation can affect nearly every organ system of the body. So care of the patient on mechanical in various aspects is really important.

Keywords: ICU, Homeostatic, Body Systems, Patient.

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INTRODUCTION

Mechanical ventilation is a method to support or assist spontaneous ventilation. Ventilators used in adult acute care use positive pressure applied to the airway opening to inflate the lungs. Although positive pressure is responsible for the beneficial effects of mechanical ventilation, it is also responsible for many potentially deleterious side effects. Application of mechanical ventilation requires an understanding of both its beneficial and adverse effect

Effects On Various Systems

Respiratory System

- Reversal of inspiratory pressure from negative
- Damage by excessive pressure and volume
- Rupture of alveoli-tension pneumothorax and pneumo-mediastinum
- Surfactant depletion
- Oxygen toxicity

Cardiovascular System

- Impairment in venous return due to positive intrathoracic pressure
- Increase in right ventricular after load

- Decrease in cardiac output esp in hypovolemic patients- multi organ failure

Psychological

- Distress
- Sleep deprivation
- Isolation from family
- Posttraumatic stress disorder

Infection

- Nosocomial infection
- Ventilator induced pneumonia
- Invasive procedures
- Indwelling lines and catheters

Aspiration

Delayed gastric emptying-RT feeding-Gastric inflation-regurgitation-Aspiration

General Care of Patients On Mechanical Ventilation

- The patients on ventilator are totally dependant on health care worker
- Meticulous hygiene is essential for control of infection
- Daily sponge bath, change of wet clothing or linen
- Dressing of hair, cleaning of eyes and use of lubricant eye ointment

- Catheterisation of bladder and diapers
- H2 blocker, proton pump inhibitors and sucralfate
- Pneumatic mattress with change of posture
- Input/output charting 1-2hrly intervals

Prevention of Ventilator Associated Pneumonia

- Head end of bed elevation
- Oral hygiene with chlorhexidine
- Stress ulcer prophylaxis
- DVT prophylaxis
- Sedation and spontaneous breathing trial

Nutrition

- Start as early as possible
- Check position of RT every time before feed
- Test feed of 4-5ml/kg of NS or D5
- Pulses, rice, eggs, milk, curd, soup finely meshed for administration through RT
- Enteral feed prevent sepsis and is emotionally satisfying
- Partial or total parenteral nutrition if cannot tolerate oral feed
- DIET- carbohydrate 30%, fat 30%, protein 30% (1600-1800 cal)

Monitoring

- Continuous monitoring of vital signs ECG,SPO2
- ABG
- Intermittent NIBP
- Electrolyte status
- Unstable patients- intra arterial BP, CVP,CO monitoring
- Urine out put monitoring 3-4 hrly

Communication with Patient

- Most of the patient are conscious
- Reassure about the progress
- Explain the procedure to be done
- Teach them to cooperate during weaning
- Sympathetic and reassuring attitude
- Intubated patient may use tapping of bed rails, fascial gestures

Post Ventilation Care

After weaning the patient from ventilator

- Monitor in ICU or in HDU unit for next 24-48hrs
- Continue oxygen and supportive care
- Monitor for hemodynamic instability
- Shift if stable for >24hrs

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