

Serial Assessment of Diaphragmatic and Peripheral Muscles Thickness and their Impact on Discontinuation of Mechanical Ventilation

**Thesis Submitted in Partial Fulfillment of Master Degree in Critical Care Medicine By
Ahmed Yehia Mohamed M.B.B.Ch**

**Supervisors Prof. Yasser Sadek Nassar Assistant professor of Critical Care Medicine Faculty
of Medicine, Cairo University**

**Dr. Mohamed Amin Fakher Lecturer of Critical Care Medicine Faculty of Medicine, Cairo
University**

**Dr. Mohamed Hmdn Allah El-Ghobashy Lecturer of Radiology Faculty of Medicine, Cairo
University Faculty of Medicine Cairo University 2018**

Abstract

Background

Diaphragmatic weakness is common in patients undergoing MV and is likely a contributing cause of weaning failure. Recent studies have suggested that the ventilator is a likely cause of the decreased diaphragm force generating capacity seen in mechanically ventilated patients. On the other hand, myopathy is a common complication of ICU stay and may delay weaning of mechanical ventilation. The study was focused on detecting the changes of both diaphragmatic and quadriceps muscles in different modes of mechanical ventilation by using ultrasound and to use diaphragm thickness and excursion as a predictor of weaning outcome. Patients and Methods: This study included 50 invasively mechanically ventilated patients. Diaphragmatic thickness (DT), diaphragmatic excursion (DE) and quadriceps muscle thickness were measured every 48 hours starting from first day of mechanical ventilation. Results: Patients on spontaneous modes of mechanical ventilation showed a higher values of DT (on days 4 and 8), and DTF (on days 2, 6 and 10) compared to patients on controlled modes. Also patients with successful weaning showed a higher values of DTF (on days 0 and 8) and DE (on days 2 and 8) compared to patients with failed weaning. The changes in diaphragmatic functions had occurred as early as first days of mechanical ventilation. The receiver operator characteristic (ROC) curves showed cut-off points for successful weaning 0.33 and 19mm for DTF and DE respectively. Quadriceps muscle showed a daily decrease of thickness regardless the mode of ventilation and there was no correlation with either DTF or DE. Conclusion: There was a continuous decline of DT and DTF among patients on controlled modes of mechanical ventilation compared to spontaneous modes. Also there was continuous decline in DTF and DE among patients with failed weaning compared to patients with successful weaning. Key words: Diaphragm, Quadriceps muscle, ultrasound, mechanical ventilation