**Introduction:**
The activity and functionality of the diaphragm are difficult to measure in patients ventilated in intensive care. Ultrasound can be a useful tool for monitoring diaphragm muscle activity during different ventilation modes. Few data currently exist on diaphragm muscle activity in critically ventilated patients [1]. Our goal is to evaluate the respiratory muscular work of the diaphragm with different settings of the respirator by means of an ultrasound scan.

**Methods:**
The ultrasound assessments of the diaphragm were performed with a 10MHz linear probe at the apposition zone. We measured the thickening of the diaphragm with the respiratory acts, through the thickening fraction (Thickening Fraction, TF), defined as: TF = (Tdimax - Tdimin / Tdimin)\% Tdimax: Diaphragm thickness at the end of inspiration (maximum thickness) Tdimin: Diaphragm thickness at the end of expiration (minimum thickness).

Ventilatory support was divided into 4 classes: 1 - spontaneous breathing (SB) or Continuous Positive Airway Pressure (CPAP); 2 - Pressure Support Ventilation (PSV) with low pressure support (5-12cmH2O); 3 - PSV with high pressure support (> 12 cmH2O); 4 - Controlled Mechanical Ventilation (CMV).

**Results:**
A total of 223 assessments were performed in 70 patients. The evaluations were all possible at the right hemidiaphragm, while on the left they were not possible in 7% of the cases. The median TF (IQ range) of the 4 ventilation classes was respectively: 42% (25-62%) in SB / CPAP; 26% (17-31%) in low-PSV; 17% (9-22%) in high PSV; and 5% (2-13%) in CMV. The Kruskal-Wallis test confirms a significant difference between the groups (p <0.0001).

**Conclusion:**
The ultrasound of the diaphragm can be a valid tool for monitoring respiratory muscle activity during mechanical ventilation.

**References:**