RESPIRATORY MECHANICS REGISTRY FOR ARDS: PILOT ANALYSIS OF A QUALITY IMPROVEMENT PROJECT
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Introduction: Respiratory system, lung and chest wall mechanics are not routinely measured in patients with the acute respiratory distress syndrome (ARDS). Many clinicians are unfamiliar with the procedure. Implementing respiratory mechanics into routine clinical practice could help to choose safe limits or useful pressures and be incorporated into a medical decision process. Airway pressure (Paw) based mechanics alone may be limited to generate individualized insights [1]. Esophageal pressure (Pes) allows estimating transpulmonary pressure (PL) to better individualize ventilator strategy [2]. We proposed a quality improvement (QI) project to facilitate integration of respiratory mechanics monitoring for management of ARDS. We report the preliminary results.

Objectives: To test whether a multidisciplinary educational program for systematic assessment of respiratory mechanics would change ventilatory management.

Methods: A voluntary QI team was composed of respiratory therapists (RTs) and clinical fellows. The QI program included 3 interventions: a) implementation of educational sessions to increase awareness and understanding of respiratory mechanics monitoring. These consisted of lectures, bench and bedside hands-on sessions, and feedback rounds; b) implementation of protocols to guide esophageal catheter placement and systematic measurements; c) creation of a PDF form automatically calculating physiological parameters and generating a report.

The QI program started in 3 ICUs. During this period, patients admitted to the ICUs who met the Berlin definition of ARDS [3] were eligible for measurements. Placement of an esophageal catheter was considered when PaO2/FiO2 ≤200. Measurements included Paw-based respiratory mechanics, Pes-based lung and chest wall mechanics, oxygenation response to PEEP and alveolar derecruitment using a simplified bedside maneuver [4]. A comparison of ventilator settings and the frequency of documented plateau pressure (Pplat) before and after measurements was conducted.

Continuous variables are presented as means ± SD and compared with the use of Student’s t-test, or medians [interquartile ranges] and compared with the use of the Mann–Whitney test, as appropriate. Dichotomous or nominal categorical variables are compared with the use of the chi-square test with normal approximation or Fisher’s exact test, as appropriate.

Results: In the first 3 months of the project, 17 RTs and 1 clinical fellow constituted the QI team. All clinical fellows attended 1 of the 8 education sessions provided in the first month. So far, 18 ARDS patients (Male/Female: 14/4, age 55±12) have been enrolled and
measured. Pes and PL were measured in 17 patients. In thirteen patients (72%), ventilation settings were changed according to the measurements, while in five (28%) settings were unchanged. Tidal volume was 6.6±1.3 and 6.3±1.0 ml/kg (P=0.021), PEEP was 13±3 and 12±3 cmH2O (P=0.009), PaO2/FiO2 ratio was 148±65 and 163±71 (P=0.355), before and after measurements, respectively. PEEP was decreased in 10 patients, from 13±3 to 10±3 cmH2O (P<0.001). Pplat was documented in 7 patients before the measurements and in 11 patients after the measurements.

**Conclusions:** A multidisciplinary QI program changed the routine ventilatory management often by limiting VT and PEEP.

**References:**