Objectives: To analyze the acute effects of body lateralization on aeration and distribution of regional pulmonary ventilation in healthy individuals breathing spontaneously.

Methods: A cohort of 10 healthy volunteers was evaluated in the supine position and a lateral decubitus position with a 30° inclination and the right hemithorax positioned upwards. The change in body position was automatically performed using the Multicare bed (Linet, Prague). Pulmonary ventilation and aeration were evaluated with the electrical impedance tomography (EIT) Enlight 1800 (Timpel, São Paulo). EIT images were segmented into four regions (ROIs: anterior right [AR], left [PL], posterior right [PR], and left [AL]). Data collection was performed at the Hospital das Clínicas of UFPE. The effect of body lateralization on regional pulmonary aeration was evaluated using the One-Way ANOVA test and Tukey's post hoc test. The interaction between regional ventilation distribution and body position was evaluated using the Two-Way ANOVA test. Differences were considered significant when the P value < 0.05.

Results: From supine to lateral decubitus position, pulmonary aeration in the AR and PR regions increased by an average of 197 mL and 130 mL, respectively. Only the AL region showed a systematic reduction in aeration, with an average of -155 mL compared to AR, PR, and PL ($p < 0.05$). The distribution of ventilation in ROIs was modified with body position ($p = 0.004$ for interaction between ROIs and position). In the supine position, the AR, AL, PR, and PL regions received, respectively, an average of $23\pm8\%$, $20\pm12\%$, $23\pm5\%$ and $32\pm17\%$ of the inspired tidal volume ($p=0.27$ for ROI comparison). In lateral decubitus position, the distribution of ventilation in the AR, AL, PR, and PL regions was $12\pm5\%$, $25\pm11\%$, $13\pm8\%$, and $48\pm12\%$, respectively ($p<0.001$ for ROI comparison).

Conclusion: This study found that body lateralization increased lung aeration in non-gravity-dependent regions (AR and PR) and decreased it in the most gravity-dependent region (AL), suggesting that the change in gravitational axis may have altered the transpulmonary pressure. Lateralization also modulated the regional distribution of ventilation, decreasing it in non-gravity-dependent regions due to the decrease in lung compliance induced by increased aeration and greater diaphragmatic mobility in the dependent region.

Implications: The analysis of the results obtained in this case series has direct and comprehensive implications for the fields of technology and health. This therapy promoted favorable results in aeration and regional distribution of ventilation, thus contributing for fundamentals in theory and practice for assessment methods employed and the reproducibility in further new studies.

Keywords: Patient Positioning, Pulmonary Ventilation, Healthy Volunteers

243

PREDICTIVE FACTORS FOR THE LENGTH OF PHYSIOTHERAPY SESSION AT ADULT INTENSIVE CARE UNIT

Leda Tomiko Yamada da Silveira[1], Alexandra Siqueira Colombo[1], Carolina Fu[1]

[1] *Department of Speech Therapy, Physiotherapy and Occupational Therapy, Faculdade de Medicina, Universidade de São Paulo (USP), São Paulo, São Paulo, Brazil*

Background: Human resource allocation at intensive care unit (ICU) is essential for safety and quality in patient care. Although planning and organization are among the most effective instruments for health care management, human resource allocation varies across settings and is usually based on expert opinion, rather than on objective grounds. The identification of predictive factors for the length of physiotherapy session at the ICU could help with planning and management in health care services.

Objectives: To identify predictive factors for the length of physiotherapy session applied to adult ICU patients.

Methods: This was a longitudinal panel study. The primary outcome was the physiotherapy session length, which was collected at one time point, however, the same patient could have more than one session length collected in different observation time points. Data were collected from a 12-bed adult ICU at a teaching, secondary-care public hospital, where common practice relies on the physiotherapists' professional judgement to decide the time allotted and procedures used to manage each patient. All physiotherapy sessions applied to clinical and surgical patients were included. Sessions abruptly discontinued were excluded. A researcher followed one physiotherapist at a time during their entire work shift, measuring the duration of each physiotherapy session using a stopwatch. Physiotherapists signed informed consent form and provided information regarding their age and experience. Patient clinical and demographic data were collected from medical records. The study hypothesis was tested based on the patient and physiotherapist-related factors and the session length using a Multilevel Mixed Model. Sample size was estimated as 308 physiotherapy sessions (20 observations/predictor + 10%). The level of significance was $p=0.05$. Analysis was performed with software Jamovi 1.6.

Results: The study assessed 339 physiotherapy sessions during 79 periods of observation, involving 181 patients and 19 physiotherapists. Average (SD) session length was 31.5 (14.5) minutes. The median number of patients assisted per physiotherapist per 6-hour shift was 5 (IQR: 4 to 5). Physiotherapists' median age was 35 (26 to 39) years-old and ICU experience was 13.0 (0.4 to 16.0) years. Patients were mostly elder, post-surgery (38.7%), with current ICU length of stay of 5 (2 to 9) days. The Multilevel Mixed Model adjusted for outliers showed that current ICU length of stay [Estimate = 0.154 (0.027 to 0.281)], contraindication for out-of-bed mobilization [Estimate = -7.835 (-10.879 to -4.791)] and current use of sedatives, invasive mechanical ventilation, or vasoactive drugs [Estimate = 3.178 (0.223 to 6.133)] were associated with the length of physiotherapy session.

Conclusion: This was a single-center study; therefore, generalization should be made with caution. In our sample, factors related to the physiotherapist, such as age or experience, were not associated with session length. Contraindication for out-of-bed mobilization decreased session length while ICU length of stay and current use of sedatives, invasive mechanical ventilation or vasoactive drugs increased session length.

Implications: The identification of predictive factors for session length may help to estimate the number of patients that one physiotherapist is able to assist during the work shift, thus improving human resource allocation.

Keywords: Intensive care unit, Human resource, Workload