

Teaching Mechanical Ventilation for Residents in Intensive Care

A randomized Trial Using Traditional Lectures VS Computer-Based Simulation (SimVA©)

Hadrien Rozé^a, Etienne Rivière^b, Rémi Dubois^c, Alexandre Ouattara^a

^aService d'Anesthésie Réanimation Sud, CHU de Bordeaux, Pessac-Bordeaux, France

^bService de médecine interne, CHU de Bordeaux, Pessac-Bordeaux, France

^cIHU LIRYC, Institut de Rythmologie et Modélisation Cardiaque, Fondation Bordeaux Université, Pessac-Bordeaux, France

Background:

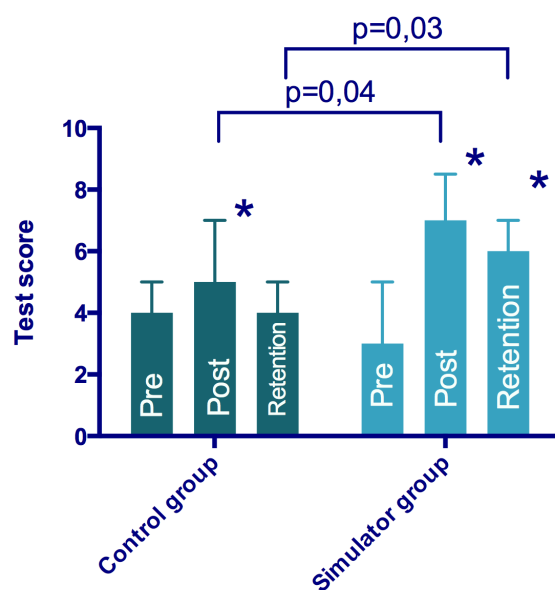
During educational process, trainees apply their knowledge to treat patient in intensive care before achieving full clinical competency. Moreover, advances in knowledge regarding mechanical ventilation in particular lung protective ventilation and asynchronies have been shown to be associated with mortality. For these reasons we developed a simulator of controlled and spontaneous artificial ventilation (SimVA) and virtual breathing patients. Mathematical model resolved differential equations of chest and lung movements according to inspiratory effort or not in order to match with a clinical database. The aim of this study was to compare two teaching modalities on mechanical ventilation: traditional lectures versus virtual simulation.

Méthod:

This randomized controlled study involved 54 residents. One group of 22 participants attended the same didactic lecture on mechanical ventilation (3 hours) whereas the other 22 were in the simulator group (3 hours). Performance was measured using a pre and post-test evaluation of knowledge on respiratory settings and pressure flow time curves monitoring. A retention test was done at 3 months (The same questioner was used for pre, post and retention test). Comparison was individual in each group (ANOVA, multiple comparison) and between groups (Mann-Whitney), $p < 0,05$ was considered significant.

Résultats :

Baseline knowledge was not different between groups; post-test was significantly improved in both groups (figure) but was significantly higher in the simulator group. Retention test was only significantly different from the pre-test in the simulator group.



Discussion:

A computer-based simulation with a modelisation of controlled and spontaneous mechanical ventilation has the potential to improve knowledge and skills in ventilator settings in comparison to traditional didactic lectures.