Comparison of Pressure Regulated Volume Control (PRVC) and Volume Control (VC) ventilation with a Servo 300 Ventilator.

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Objective: To test the hypothesis that a new mode of ventilation (PRVC) is associated with improvements in respiratory mechanics, gas exchange and outcome when compared with conventional VC ventilation with the same ventilator in patients with acute respiratory failure.

Design: Randomized, prospective, with a crossover trial.

Setting: General ICU of a university hospital.

Patients: 41 patients with acute respiratory failure. Inclusion criteria: $\text{PaO}_2/\text{FIO}_2$ ratio of < 40 with PEEP 5 cm H_2O and FIO_2 between 0.4 and 0.6.

Measurements: After a stabilization period of eight hours APACHE II score was calculated. A crossover trial of 2 hours with identical ventilator settings except for PRVC/VC was conducted. The following variables were measured: Peak Inspiratory Pressure (PIP), PaO_2 and PaCO_2 .

During the rest of the patients stay in ICU the following parameters were recorded: Days on ventilator, failing the assigned mode of ventilation ($\text{PIP} > 50$ cm H_2O) and survival.

Results: Crossover trial

	PIP (cm H_2O)	PaO_2 (kPa)	PaCO_2 (kPa)
PRVC	21 (20-23)*	13.2 (12.4-15.0)	5.7 (5.4-6.2)
VC	25 (23-27)*	13.0 (12.3-14.6)	5.7 (5.4-6.2)
<i>median (95% conf.)</i>	<i>*p=0,0001</i>	<i>n.s.</i>	<i>n.s.</i>

General trial

	Days on ventilator	Failing	Survival
PRVC	7.3 (3.9-10.7)	0/21	11/21
VC	6.3 (3.7-8.8)	2/20	10/20
<i>median (95% conf.)</i>	<i>n.s.</i>	<i>n.s.</i>	<i>n.s.</i>

Conclusions: Peak inspiratory pressure was significant lower on Pressure Regulated Volume Control than on Volume Control, and thus PRVC may be superior to VC in certain patients. However in this unselected group of patients we could not demonstrate that PRVC improves outcome.