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Biphasic cuirass ventilation decreased the indices of pulmonary circulation in patients with secondary pulmonary hypertension
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INTRODUCTION
Biphasic cuirass ventilation (BCV) is a non-invasive extrathoracic positive/negative pressure mechanical ventilation. We reported BCV decreased pulmonary artery pressure (PAP) in patients with secondary pulmonary hypertension (PH) due to chronic respiratory failure (CRF). In this study, we investigated the effect of BCV on pulmonary circulation to seek the mechanism of decreasing PAP.

METHODS
Fifteen steady-state PH caused by CRF patients were included. None were given vasodilator and nor diagnosed dehydration. PH was defined as mean PAP (mPAP) > 20 mmHg determined by right heart catheterization (RHC). Control mode was applied in combination with negative/positive pressure between -15 and -25 cmH2O /3 and 10 cmH2O. BCV was performed 1 hour/day for 2 week not to exhaust the patients. Data from RHC, the serum levels of N-terminal proB-type natriuretic peptide (NT-proBNP) and noradrenalin were obtained before and after the trial of BCV. Patients were interviewed the comfort around BCV. Data were analyzed by the Wilcoxon test p<0.05 was considered statistically significant.

RESULTS
mPAP, pulmonary artery occlusion pressure and cardiac index decreased significantly (27.3 to 23.1 mmHg, p=0.004, 13.9 to 9.4 mmHg, p=0.018, and 2.72 to 2.44 l/min/m2, P=0.035, respectively) without the increase in pulmonary vascular resistance index. NT-proBNP significantly decreased (240.6 to 110.4 pg/ml, p=0.025, respectively), but noradrenalin didn't change. Eleven patients (73%) answered comfortable during and after BCV.

CONCLUSIONS
The results suggest BCV decreases cardiac load in these patients. Further studies are needed to assess the clinical and physiological effects of BCV.