**Poster Board # 208** Controlled Mechanical Ventilation In Septic Animals: Effects On Diaphragm Function,

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Rationale: Controlled mechanical ventilation (CMV) has been shown to result in diaphragmatic dysfunction and atrophy. In patients, confounding factors contribute to these data while animal studies refer to data obtained from animals with a healthy diaphragm. Whether mechanical ventilation results in more severe diaphragm dysfunction in animals with already weakened diaphragms is not known, although this may be of great clinical relevance. Ventilated patients often suffer from sepsis and those patients are more difficult to be weaned from the ventilator. In addition, sepsis is known to negatively impact respiratory muscle function. We therefore tested whether CMV in septic animals would result in a further deterioration of diaphragm function compared to healthy animals.

Methods: Male Wistar rats were divided into 3 groups: sepsis, sepsis+CMV and healthy+CMV. Animals were first treated with either a single ip injection of lipopolysaccharide (LPS, 5mg/kg) to induce sepsis or with saline. Twelve hours later, half of the septic animals (LPS+CMV) and the saline-treated rats (saline+CMV) were submitted to 12h of CMV while the remaining septic animals (LPS) were kept as such for 12h. All animals were studied at the same time point, namely 24h after saline or LPS administration. To maintain fluid volume status LPS treated animals were given subcutaneous injections of saline (60 ml/kg/12h).

Measurements and main results: The levels of IL-6 were significantly increased in the LPS-CMV group in plasma and in the diaphragm compared to the other groups. Diaphragm force was significantly lower in septic animals (both groups) compared to saline+CMV with an additional decrease in the LPS+CMV group compared to the LPS group (see Figure).

Diaphragm cross-sectional area of the different fiber types was similar in all groups. mRNA expression of diaphragm MuRF1 and atrogin-1, both markers of the proteasome system, were significantly higher in the LPS+CMV group compared to the other groups. In addition, significant inverse correlations were observed between diaphragm tetanic tension and mRNA expression of MuRF1 and atrogin-1. Diaphragm 4-HNE, a marker of oxidative stress, was similar in all groups.

Conclusion: These data clearly show that CMV in septic animals, with an already weak diaphragm, further compromises diaphragm function and activates atrophic pathway.
Session Info: Poster Discussion Session, [A24] VENTILATING THE INJURED LUNG: NO FREE LUNCH
Day/Date: Sunday, May 19, 2013
Session Time: 8:15 AM - 10:45 AM
Poster Viewing: 8:15 AM - 9:15 AM
Discussion: 9:15 AM - 10:45 AM
Room: Room 108 A-B (100 Level) Pennsylvania Convention Center