Introduction:
High oxygen can damage tissues [1]. In this study, we analyze the histological and pulmonary mechanics modifications that can occur when identifying different inspiratory oxygen fractions (FiO₂) in lungs of healthy rats during protective mechanical ventilation.

Methods:
We use Sprague-Dawley rat. 4 groups were designed, each with 6 animals, the tidal volume (6 ml/kg), PEEP (3 cmH₂O) and respiratory rate (90 rpm) were kept constant, changing the FiO₂ between the groups. Four groups were established: FiO₂ 0.21, 0.4, 0.6 and 1. After 4 hours, the lungs were removed for histological study and obtaining the wet/dry index. The histological modifications studied were: alveolar septa (AS), alveolar hemorrhages (AH), intraalvelolar fibrin (IF) and inflammatory infiltrates (II). Each parameter was rated from 0 to 3 [2]. Peak pressure (Pp) and pulmonary compliance were monitored every 60 minutes. Different statistical tests will be used to analyze the data.

Results:
References to the damage produced in the AS, AH, IF, II and the global histological pattern were identified in the groups with the highest FiO₂ and there was more damage (p <0.00001) (Graphic). The wet/dry index rose significantly as the oxygen concentration increased (p = 0.001). In the groups to which a FiO₂ of 0.6 and 1 was administered, the Pp selected specific values with respect to the baseline intake from the first 60 minutes, an aspect that was not appreciated in the other groups (p <0.0001). Regarding pulmonary compliance, it will be seen that, in the FiO₂ 0.6 and 1 groups, it decreased from the first 60 minutes, finding differences with respect to the other groups (p <0.0001).

Conclusion:
Mechanical ventilation applied for 4 hours in healthy animals produces disorders that are more pronounced as oxygen concentration increase. FiO₂ greater than or equal to 0.6 should be avoided without clinical justification.

References:
Distribution of the percentage of global histological involvement among the groups (median and P25-75)