

CHANGES IN THE SIZE OF RAT TYPE II PNEUMOCYTE LAMELLAR BODIES FOLLOWING A HYPEROXIC INSULT

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Acute pulmonary interstitial injury, such as following hyperoxia, is known to cause a proliferation of type II pneumocytes. However, little is known about the reaction of the intracellular lamellar body (LB) compartment, the source of pulmonary surfactant, to such injury. The following morphometric study was conducted for this reason.

Groups of five female Wistar rats were exposed to room air (control) or 100% oxygen for 60 hrs and either killed immediately (0 days) or returned to room air for 3 days. The left lung was fixed intratracheally at 20cmH₂O with 2.5% Glutaraldehyde and 1% tannic acid in cacodylate buffer pH 7.4, and processed for electron microscopy. One block was randomly selected from each animal. A systematic sampling procedure was used to photograph equal numbers of type II cells from each animal. The projected area of type II pneumocytes and their LB was determined using a Leitz ASM image analyser on the photomicrographs at a final magnification of 14,700.

Changes in the size of Type II cells and LB following oxygen

| | Control | 0 days | 3 days |
|---------------------------|-----------------|------------------|------------------|
| Type II cell area μ^2 | 16.8 \pm 2.1 | 20.9 \pm 1.7 | 51.0 \pm 3.9* |
| LB area μ^2 | 0.35 \pm 0.01 | 0.19 \pm 0.01* | 0.84 \pm 0.04* |
| Number of LB/cell area | 10.1 \pm 0.8 | 9.5 \pm 1.0 | 10.8 \pm 1.3 |

Mean \pm SEM *p < 0.01 (Compared to control)

Although there was a significant fall in LB material at 0 days, there was a dramatic increase in both the size of the cells and of the LB after 3 days recovery.

In conclusion there are significant changes in the lamellar bodies of type II pneumocytes following hyperoxia which are different in the injury phase from the recovery phase.

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