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Intense hypoxic cycle exercise does not alter lung density in competitive male cyclists.

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We tested the hypothesis that intense short duration hypoxic exercise would result in an increase in extravascular lung water (EVLW), as evidenced by an increase in lung density. Using computed tomography (CT), baseline lung density was obtained in eight highly trained male cyclists (mean +/- SD: age = 28 +/- 8 years; height = 180 +/- 9 cm; mass = 71.6 +/- 8.2 kg; VO2max= 65.0 +/- 5.2 ml kg min(-1)). Subjects then completed an intense hypoxic exercise challenge on a cycle ergometer and metabolic data, HR and %S(p)O2 were recorded throughout. While breathing 15% O2, subjects performed five 3 km cycling intervals (mean power, 286 +/- 20 W; HR = 91 +/- 4% HRmax) separated by 5 min of recovery. From a resting hypoxic S(p)O2 of 92 +/- 4%, subjects further desaturated during exercise to 76 +/- 3%. CT scans were repeated 76 +/- 10 min (range 63-88 min) following the completion of exercise. There was no change in lung density from pre (0.18 +/- 0.02 g ml(-1)) to post-exercise (0.18 +/- 0.04 g ml(-1)). The substantial reduction in S(p)O2 may be explained by a number of potential mechanisms, including decreased pulmonary diffusion capacity, alveolar hypoventilation, reduced red cell transit time, ventilation/perfusion inequality or a temperature and pH induced rightward-shift in the oxyhaemoglobin dissociation curve. Alternatively, the integrity of the blood gas barrier may have been disrupted without any measurable increase in lung density.