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Title: Reversibility of diffusion capacity abnormalities in patients with clinical hypothyroidism with establishment of euthyroid state

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Body: Background: Hypothyroidism is associated with significant reduction of parameters of diffusion capacity and slight peripheral obstruction. However, it is not quite clear whether these abnormalities are reversible. Aim: To evaluate the reversibility of diffusion capacity ($D_{L,CO}$) abnormalities in patients with clinical hypothyroidism with establishment of euthyroid state. Patients and methods: Sixteen patients with different forms of autoimmune thyroiditis in clinical hypothyroid state (male/female – 4/12; age = 43.0 ± 13.4 (mean \pm SD), TSH = 101.6 ± 52.3 mIU.L⁻¹, FT4 = 4.9 ± 3.8 pmol.L⁻¹) and 14 age and sex matched controls were included in the study. Pulmonary function assessment included slow vital capacity, forced spirometry and diffusion measurements (MasterScreen Diffusion, E. Jaeger, Germany). Results: Most of the patients with hypothyroidism (13/16) revealed significantly reduced diffusion capacity for carbon monoxide ($D_{L,CO}$ %pred. = 70.5 ± 6.7 vs 93.8 ± 12.9 in controls; $p < 0.001$) that correlated with the levels of TSH ($r = -0.587$; $p < 0.05$) and FT4 ($r = 0.515$; $p < 0.05$). Following approximately six months of treatment and reaching a euthyroid state (TSH = 3.6 ± 1.9 mIU.L⁻¹) diffusion capacity was significantly improved ($D_{L,CO}$ = 80.3 ± 10.3 vs. 70.5 ± 6.7 before treatment; $p = 0.020$). No changes were apparent in the other pulmonary function parameters. Conclusions: Hypothyroidism is associated with significant reduction of diffusion capacity. Restoring euthyroid state reverses these abnormalities as seen by the substantial improvement of $D_{L,CO}$.