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Intravenous iron replacement improves exercise tolerance in COPD: A randomised trial

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Background: Iron deficiency affects exercise capacity because of the iron's critical role in the optimal functioning of skeletal muscle metabolism. We hypothesized that intravenous iron may improve exercise tolerance, quality of life (QoL) and daily physical activity (DPA) in patients with chronic obstructive pulmonary disease (COPD).

Methods: This is a placebo controlled, single-blind, and parallel group clinical trial. Iron deficiency was defined as a ferritin level < 100 ng/mL or a ferritin level between 100 and 299 ng/mL with a transferrin saturation < 20 %, with or without mild anaemia. Patients were randomised in a 2:1 ratio to receive intravenous ferric carboxymaltose or placebo. The primary endpoint was to investigate whether intravenous iron replacement improved at least 33% endurance time from baseline. The secondary aims were to evaluate the impact on QoL through the COPD Assessment Test (CAT) and DPA by accelerometry.

Results: We included 66 patients, 44 (66.7 %) in the intervention group and 22 (33.3 %) in the placebo group. Among patients receiving ferric carboxymaltose, 23 (52.3 %) achieved the primary endpoint compared to 4 (18.2 %) in the placebo group [p=0.009; Relative Risk 3.12, (95 % CI, 1.19-8.12)]. CAT score decreased 3 (6.0 - 1.0) points from baseline in the intervention group (p=0.007), in contrast to placebo group [1 (-4.0 - 2.3) points, p=0.236] without differences on DPA and adverse events in both groups.

Conclusions: Iron replacement improved exercise capacity and QoL in stable COPD patients with iron deficiency. This treatment was well tolerated.