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Upper limb muscle strength and endurance in Chronic Obstructive Pulmonary Disease

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Introduction: Skeletal muscle weakness is an overlooked effect of chronic obstructive pulmonary disease (COPD).

Objectives: In this case-control study we compared skeletal muscle strength and endurance of a group of patients with COPD with a comparable group of healthy volunteers.

Methods: Upper limb muscle strength and endurance of 18 males and 12 females from a medical clinic of a tertiary care hospital with diagnosed COPD was measured by a handgrip dynamometer using prescribed protocol and was compared with muscle strength and endurance of 30 healthy age, gender and body mass index (BMI) matched volunteers. Patients with concomitant severe cardiac, neurological and rheumatological conditions were excluded. Data were analyzed using SPSS version 16. Two sample T-test was used to identify the statistical significance.

Results: There was no significant difference in BMI of cases and controls (males mean BMI: cases 19.8kgm², controls 20.4kgm²; $p = 0.73$; females mean BMI: cases 20.4kgm², controls 18.6kgm²; $p = 0.19$). Muscle strength and endurance were significantly lower in cases when compared with controls, both in males (mean muscle strength: cases 19.8kg, controls 29.3kg, $p < 0.001$. mean endurance: cases 80.6s, controls 190.2s, $p < 0.001$) and females (mean muscle strength; cases 11.8kg, controls 23.3kg, $p < 0.001$, mean endurance: cases 49.3s, controls 111.3s, $p < 0.001$).

Conclusions: In this study a population of patients with COPD had significantly lower muscle strength and endurance. Since muscle weakness contributes to poor ventilation and quality of life, programmes to improve muscle strength and endurance should be considered in the management of COPD.