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Inspiratory muscle training in conjunction with creatine monohydrate supplementation enhances inspiratory muscle strength in healthy humans

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Background: Training-induced improvements in locomotor muscle size and strength can be enhanced with concurrent creatine monohydrate (Cr) supplementation; however, whether inspiratory muscle training (IMT) elicits greater improvements in inspiratory muscle strength when combined with Cr remains to be determined. **Aim:** To test the hypothesis that IMT + Cr results in greater improvements in inspiratory muscle strength in comparison to IMT alone. **Method:** Twenty-nine healthy active males (age: 21 ± 1yrs; BMI: 23 ± 3kg/m^2) with normal lung function (FEV_1 >80% pred) completed 4-weeks of IMT (POWERbreathe®) (30 breathes, twice daily, at an inspiratory load equivalent to 50% of maximum inspiratory pressure [PImax]), either alone (IMT: n= 15) or with Cr (IMT + Cr: n= 14). Cr was administered as 20g.d^{-1} for 7-days (loading phase) and 3g.d^{-1} for 21-days (maintenance phase). Inspiratory muscle measurements were obtained pre and post IMT. **Results:** Baseline PImax was comparable between groups (P=0.554). PImax increased 18% post IMT (123 ± 28 cmH_2O to 145 ± 28 cmH_2O; P<0.001) and by 33% post IMT + Cr (117 ± 28 cmH_2O to 156 ± 20cmH_2O; P<0.001). The increase in PImax post IMT + Cr was greater in comparison to IMT (condition-time interaction effect: P=0.031). **Conclusion:** IMT + Cr led to greater (+17cmH_2O) and potentially clinically meaningful improvements in PImax compared with IMT alone. Future research should focus on the therapeutic potential of Cr (+/- IMT) as a treatment modality

for pathological conditions characterised by respiratory muscle dysfunction and establish whether the underlying mechanisms are directly linked to improved muscle fibre function.