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**Title:** Acu-TENS reduces breathlessness during exercise in people with COPD

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**Body:** The aim was to evaluate the effect of the application of transcutaneous electrical nerve stimulation of acupoints (Acu-TENS) on breathlessness during exercise. Methods: Individuals diagnosed with COPD were recruited in this randomized crossover study. Participants performed two incremental shuttle walk tests (ISWT) to determine an appropriate speed for the endurance shuttle walk test (ESWT). After a session for practice of the ESWT, participants attended twice, one week apart, and performed two ESWTs per visit. On each visit, the second ESWT was performed with either Acu-TENS, i.e. application of TENS onto acupoints for breathlessness (EX-B1, Dingchuan) or Sham-TENS, i.e. application of TENS onto non-acupoints on the patella, in random order, for 45 minutes prior to and during the second ESWT. The assessor was blinded to group allocation. The duration of each ESWT and the dyspnoea score (Borg scale, 0-10) at isotime of the two ESWTs on any one visit were recorded for comparison. Results: Twenty-one participants, mean ( $\pm$ SD) age 71 $\pm$ 6 years, FEV<sub>1</sub> % pred 51 $\pm$ 22%, completed the study. At isotime, Acu-TENS showed a significant between-group reduction in dyspnoea of -0.7 unit (95%CI -1.2 to -0.1), p=0.016. A subgroup analysis of participants with dyspnoea  $\geq$  4 (n=12) at end of the ISWT showed a significant reduction in dyspnoea with Acu-TENS compared to Sham-TENS of -1 unit (95% CI -1.7 to -0.3), p=0.011, but not in those with dyspnoea <4 (n=9). No significant difference in endurance shuttle walk duration was observed between groups. Conclusion: Acu-TENS may alleviate dyspnoea during walking in people with COPD, particularly in those who had more severe dyspnoea during exercise.