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Title: Feasibility of neuromuscular electrical stimulation (NMES) on the intensive care unit (ICU): Preliminary results

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Body: Background: Survivors of critical illness often have a prolonged ICU stay. To attenuate their reduction in muscle mass and muscle strength, NMES might be useful. Aim was to study feasibility and safety of NMES in ICU. Methods: Patients with expected prolonged stay in ICU of 5 additional days (judged on day 3) without neurological disease were included. They received daily bilateral quadriceps NMES sessions of 25 minutes. Main outcome was to produce contraction of quadriceps. Patients with contraction in 75-100% of sessions were considered responders. Patient characteristics and stimulation parameters were compared between responders and non-responders. Safety was judged by cardiovascular and respiratory responses. Results:

Table 1: Feasibility of NMES

	RESPONDERS N=17 (50%)	NON-RESPONDERS N=17 (50%)	P-VALUE
age (years)	56.6 (±10.8)	63.2 (±11.1)	0.084
BMI	25.3 (±4.2)	25.1 (±6.1)	0.920
Barthel-index (/20; premorbid)	17.1 (±3.5)	18.3 (±2.3)	0.331
APACHE II	22.5 (±8.1)	27.5 (±6.9)	0.090
Glasgow coma scale	7.0 (±2.7)	8.4 (±3.4)	0.192
5 questions for adequacy	1.5 (±1.5)	2.3 (±1.6)	0.171
oedema	5	11	0.084
placing of electrodes (*)	0	4	0.103
intensity (mA)	64.9 (±8.9)	66.1 (±13.7)	0.748

(*) different from standardised position due to catheters

Table 2: Safety of NMES

	PRE	POST	P-VALUE
heart rate	90.1 (±13.2)	91.2 (±15.3)	0.230
systolic blood pressure (mmHg)	131.4 (±14.8)	132 (±13.4)	0.733
diastolic blood pressure (mmHg)	65.4 (±7.1)	65.0 (±7.9)	0.598
saturation	96.5 (±2.8)	96.5 (±2.8)	0.957
respiratory rate	20.7 (±4.7)	20.1 (±4.4)	0.271

Conclusion: In this small sample a trend is observed for age, APACHE II and edema to influence efficacy of NMES. NMES is a safe intervention in ICU.