BJS Prize Abstracts

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BJS Prize 1
Postoperative electrical muscle stimulation attenuates loss of muscle mass and function following major abdominal surgery: A split body randomised control trial

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Aims: Significant loss of muscle mass and function occurs after major abdominal surgery. Neuromuscular electrical stimulation (NMES) has been shown to reduce muscle atrophy in some patient groups, but evidence in postoperative patients is limited. This study assesses the efficacy of NMES in attenuating muscle atrophy following major abdominal surgery.

Methods: Fifteen patients undergoing open colorectal resection were recruited to a split body randomised control trial and their lower limbs randomised to control (CON) or NMES (STIM). The STIM limb underwent 15 minutes of quadriceps NMES twice daily on postoperative day (POD) 1 to 4. Ultrasound measurement of Vastus Lateralis (VL) cross sectional area (CSA) and muscle thickness (MT) was made preoperatively and on POD 5, as was dynamometer measurement of knee extensor strength (KES). All outcomes were analysed using linear mixed model techniques. The study was approved by NHS research ethics committee (ref 20/ EM/069).

Results: NMES significantly reduced the loss of CSA (-2.52% vs -9.16%, p<0.001), MT (-2.76% vs -8.145, p=0.001) and KES (-10.35% vs -19.69%, p=0.03). No adverse events occurred, and patients reported that NMES caused minimal or no discomfort.

Conclusions: NMES reduces loss of muscle mass and function following major abdominal surgery and may be an important tool in aiding recovery to normal activity levels. This will be especially important in preventing postoperative loss of independence in the increasingly physiologically frail patients undergoing major abdominal surgery. Further studies should establish the efficacy of bilateral whole-leg NMES for improving patient-centred outcomes.