

Daily use of a muscle pump activator device reduces hospitalization and improves graft function post-transplantation: A randomized controlled trial

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Introduction

Kidney and simultaneous pancreas-kidney (SPK) transplant recipients can have prolonged postoperative hospitalization due to edema, delayed mobilization, and delayed graft function. Traditionally, TED stockings with intermittent pneumatic compression devices (TED/IPC) are placed preoperatively to prevent deep vein thrombosis (DVT). The objective of this trial was to evaluate the effects of TED/IPC vs. muscle pump activator (MPA) on factors that could reduce postoperative complications and decrease length of stay.

Methods

In this single-centre, prospective, randomized-controlled trial, 221 kidney or SPK transplant recipients were randomized to either wearing TED/IPC or MPAs for seven days postoperatively. Groups were compared with respect to days in hospital, postoperative lower limb edema, weight, mobility, urine output, serum creatinine, delayed graft function (DGF), need for dialysis, and renal blood flow.

Results

Patients assigned to wear the MPA device were found to have a significantly shorter hospital stay compared to the TED/IPC group ($p=0.038$). Changes in mid-calf leg circumference and patient weight were significantly lower in the MPA group ($p=0.001$ and $p=0.003$, respectively). The TED/IPC group were overall less mobile with less total steps recorded on a pedometer ($p=0.009$). The MPA device improved blood flow to the renal allograft with higher peak systolic velocity in the arcuate artery ($p=0.001$) and higher femoral vein velocity ($p=0.001$). There was significantly higher urine output in the MPA group ($p=0.003$) but objective measures of renal function, including frequency of DGF, number of dialysis runs, and serum creatinine, were not different between the two groups.

Conclusions

Postoperative use of the MPA device decreases duration of hospitalization after kidney transplantation. This may be attributable to improved renal blood flow to the transplant allograft and thus increased urine output and decreased fluid retention.