The impact of a muscle pump activator (MPA) on incisional wound healing compared to standard TED stockings and compression devices in kidney and kidney-pancreas transplant recipients. A randomized controlled trial.

Shahid Aqil1,2,3, Bijal AlHarbi1,2,3, Katharine Paccoli3, Hemant Sharma1,2,3, Patrick Luke2,4, Alp Sener1,4

Departments of Surgery1, Multi-Organ Transplant Program2, London Health Sciences Center, Matthew Mailing Center for Translational Transplant Studies3, Microbiology and Immunology4 Western University, London, Ontario, Canada.

INTRODUCTION

Transplantation is the most optimal mode of renal replacement therapy for patients. Wound infections contribute significantly to postoperative morbidity after kidney and kidney-pancreatic transplantation and are, likely primarily attributable to the obligate medication regimen immunosuppressants prescribed to these patients. Unfortunately, transplantation is still associated with potential complications such as surgical site wound infection, deep vein thrombosis (DVT), and thromboembolism.

The incidence of infectious complications during the first year after renal transplantation was 49.3% and with surgical intervention and wound infections ranging from 10 to 27.3%. Some studies documenting simultaneous pancreas and kidney (SPK) transplantation infectious incidence rate remains unknown, but infectious and primary tract infections are the most prevalent infection.

TWO STOCKINGS & IPC DEVICES

Traditional methods to prevent edema and DVT use thromboembolism deterrent (TED) stockings and intermittent pneumatic compression (IPC) devices. Both devices promote venous blood flow, which is necessary in the treatment of leg edema. TED stockings are worn on the legs to provide a constant pressure to the limbs. IPC devices consist of an inflatable sleeve that is intermittently inflated and deflated. Both devices have limitations such as decreased comfort for the patient. IPC devices can also cause excessive heat and sweating under the sleeve, and have inconvenient size, weight, and external power source requirements.

MPA DEVICE

An alternative to TED stockings and IPC therapy is the MPA device. This is a small, self-powered neuromuscular stimulation device that was designed to reduce the risk of DVT and pulmonary embolism (PE). It has been approved for use by Health Canada. It is attached on the skin over the common peroneal nerve in the legs, where it emits painless, low-voltage electrical impulses to this nerve in order to activate the contraction of the calf muscle. This improves the emptying of the veins in the legs and increases blood flow to the heart. Wound healing is most efficient with increased blood flow through the body, since increased blood flow enhances Transcutaneous Oxygen Tension (TcPO2), which is known to be a predictor of tissue viability. The increased blood flow achieved by the MPA device in the lower limbs thus increases TcPO2, potentially promoting favorable wound healing conditions.

OBJECTIVE

To evaluate the impact of TED-IPC (stockings + intermittent pneumatic compression) versus MPA on incisional wound healing in SPK and SPK transplant recipients with a RCT.

METHODOLOGY

This was an investigator-initiated, ethically approved, randomized controlled, double-blinded trial. The sample size was estimated to be 60 patients on power calculation.

RESULTS

There are no significant differences in age, sex, BMI and length of stay of recipients in either group (Table 2).

CONCLUSION

The use of a MPA device in the immediate post-operative period leads to a significant improvement in wound healing between POD 5 to POD 30 in kidney and SPK transplant patients, as compared with the standard treatment.

In the future, a multi-centre trial can affirm our experience. It may also be interesting to evaluate the impact that the MPA device on patient satisfaction. It is possible that the enhanced wound healing and comfort of the device in comparison with standard TEDs and IPCs may affect a patient's satisfaction on the care they are receiving. This could be performed by administering validated questionnaires to the patients that are proven to measure satisfaction.

REFERENCES