CORRESPONDENCE

Treatment by Functional Electrical Therapy of an Unresolved Peritoneal Leakage in a Peritoneal Dialysis Patient

KEY WORDS: Dialysate leakage; functional electrical therapy.

Editor:

Dialysate leaks are one of the major noninfectious problems in peritoneal dialysis (PD) patients. A pre-disposition to this mechanical and intra-abdominal pressure-related complication of the abdominal wall (1) has been noted in patients with a previous history of multiple surgeries and pregnancies, hernias, overcapacity dialysate volume, heavy straining, and obesity. The infection-leak relationship is a vicious circle in which one causes the other (1,2). Surgical repair, temporary transfer to hemodialysis, or institution of automated PD and a decrease in the dialysate volume are among the treatment approaches. However, those choices are either invasive or are associated with a higher risk of procedure-related complications. How to approach a patient not responding to those therapies is also not clear.

Functional electrical therapy (FET) or stimulation (FES) is a method used mostly in patients with muscle disorders. Using a low-dose electrical current, FET is given at intervals to make muscles contract, retract, and strengthen. The effects on the muscles are proposed to occur by modification of myotopology and skeletal muscle oxidative capacity (3). In chronic wounds, FET is proposed to hasten healing by enhanced migration of neutrophils and macrophages, stimulation of fibroblasts, and increased blood flow (4–6).

A 53-year-old woman on PD came to our unit with complaints of fatigue, exhaustion, and peripheral edema. Her past history revealed initiation of PD 5 years earlier because of hypertension-associated end-stage renal disease and the presence of intense at-home exercise in recent weeks. She weighed 58 kg, her blood pressure was 160/80 mmHg, and she had peripheral edema and signs of subcutaneous leakage from the upper abdominal wall. No findings of peritonitis or exit-site infection were present.

As an initial approach, she was advised to exercise the abdominopelvic muscles, and her dialysis regime was changed from 2-L exchanges to 1.5-L exchanges 4 times daily. At her next visit, she was switched to automated PD because of a lack of response. Despite 12 months of automated PD with a low dialysate volume, leakage could not be prevented. After reviewing the literature on the effects of FET, it was the consensus of the physicians at our unit to start FET therapy.

Once the patient had been adequately informed about the procedure and given written consent, FET (Figure 1) was applied using the Compex 3 stimulator (Compex Médical, Ecublens, Switzerland) according to the precautions and recommendations in the product manual. The process was carried out in a room in the outpatient clinic. Any device creating electromagnetic waves were not allowed in the room during the process. For 20 minutes daily, with the patient in supine position, 20 – 30 mA of faradic and Russian currents were applied to electrodes placed diagonally at 4 different points on the abdominal wall. Vasovagal reaction, a side effect of the process, did not occur during the process. In addition, the patient performed mild physical therapy exercises to strengthen the frontal wall of the abdomen (with caution, so as not to increase intra-abdominal pressure too much) for 10 minutes every day.

The treatment continued for 10 sessions on 10 consecutive days. The leak started to diminish on day 5, and after 10 sessions, the leak had completely resolved. At the time of writing, the patient continues on automated PD without any leakage despite a 2-L dialysate volume.

This outcome clearly shows that FET can be an important tool in managing dialysate leaks. Importantly, the FET procedure is easy, noninvasive, relatively inexpensive, and lacking in major harmful effects. The therapy can also be performed at home (although, in this case, we decided to use it in the outpatient clinical, being that it was a novel treatment for our unit). It can reduce the number of visits and the total cost to overcome a leakage problem. Major suggestions are that treatment should be individualized, be performed by a skilled person, be prolonged if symptoms are not well controlled, and be closely monitored for treatment characteristics.

Figure 1 — Application of functional electrical therapy.

Despite this successful outcome with the novel FET method, we emphasize the limitations of this report: specifically, the lack of determination of the site and extent of the leak by computed tomography peritoneogram, and the nature of this case as a single experience with the method. Future clinical and experimental studies enrolling more patients are needed to confirm the effect. Also, healing of a late leak is reported. How FET might be applied in an early leak requires further studies.

In conclusion, we have presented a novel approach to dialysate leaks. Integration of FET into the management of dialysate leaks not only in nonresponsive cases, but also from the initial diagnosis of a leak may provide many benefits. Application of this process at early stages of a leak may also reduce the need for surgery. Further clinical research may provide more data on this issue.

DISCLOSURES

The authors have no conflicts of interest to declare.

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