Editorial

Chronic exit-site care using povidone–iodine versus normal saline in peritoneal dialysis patients

Continuous ambulatory peritoneal dialysis is an important treatment method for patients with end-stage renal disease. Although the incidence of catheter-associated complications such as peritonitis and exit-site infection has been decreasing, these complications have not been resolved completely. Therefore, prevention of catheter-associated infections is essential both soon after peritoneal dialysis (PD) catheter placement and during long-term PD treatment. The currently used local application materials for prophylactic exit-site care in PD patients in Korea are povidone–iodine (92.7%), hydrogen peroxide (4.4%), normal saline (1.2%), alcohol (0.9%), and chlorhexidine (0.8%) (personal communication; Baxter, Gambro and FMC, June 2014). The role of topical disinfectants in long-term exit-site care remains unclear. Moreover, much controversy surrounds the prophylactic strategies used to prevent such infections.

Several reports indicated lower incidence rates of exit-site infection with the use of povidone–iodine than with other cleansing methods in PD patients. Luzar et al [1] reported that, in a large randomized trial, a nonocclusive dressing plus povidone–iodine was found to be associated with a lower rate of exit-site infection than soap and water alone (0.27 vs. 0.71 episodes/patient-year). In addition, in a nationwide survey for exit-site care in Austria, disinfectants for chronic exit-site care included povidone–iodine (n=155), sodium hypochlorite (n=31), povidone–iodine plus sodium hypochlorite (n=102), and octenidine dihydrochloride/phenoxyethanol (n=17). In this randomized controlled trial, local application of povidone–iodine solution at the exit-site significantly reduced the rate of exit-site infections, compared with local treatment with water and a nondisinfectant soap [2].

Grosman et al [3] reported that the alternative cleansing agent 50% Amuchina (electrolytic chloroxidizer) was more effective than 10% povidone–iodine and as effective as 4% chlorhexidine, but with fewer adverse secondary effects. Patients using 3% Amuchina presented an exit-site infection rate similar to that in patients using 50% Amuchina. No adverse secondary effects were observed with the use of Amuchina at either concentration. The cost of 3% Amuchina was significantly lower than that of the 50% concentration, and it was even lower than the cost for 10% povidone–iodine or 4% chlorhexidine.

In the literature, no consensus has been reached regarding the prophylactic use of povidone–iodine or other antiseptics at the exit-site in all patients. However, povidone–iodine is still the most popular antiseptic material for prophylactic use and for treating exit-site care in patients undergoing PD worldwide. Polyurethane catheters can be damaged by long-term exposure to povidone–iodine but not silicon catheters.

Allergic dermatitis around the catheter exit-site, caused by topical antiseptics such as povidone–iodine and chlorhexidine gluconate, is an uncommon complication in patients undergoing long-term PD. The frequency of this type of dermatitis is not known because reports of isolated cases constitute the only source of information [4]. Allergic dermatitis around the catheter exit-site, including anaphylaxis, caused by povidone–iodine is increasingly reported as a complication. Antiseptic solutions should be used cautiously in such patients. Although the irritation induced by the local application of povidone–iodine can lead, although infrequently, to secondary exit-site infection, this is the most common reason for patients to stop using povidone–iodine. In particular, Yavascan et al [4] reported that the povidone–iodine group had significantly higher rates of exit-site infection, but showed no difference in the risk of peritonitis and the number of removed catheters compared with the normal saline group. In this study, 98 patients treated with either povidone–iodine or normal saline were included. For Group 1 (34 patients), povidone–iodine was used, and for Group 2 (64 patients), the exit-site was simply cleaned with normal saline (0.9% NaCl). The frequency of exit-site infection was significantly higher in Group 1 (povidone–iodine) than in Group 2. Therefore in this study, exit-site care with normal saline was an effective strategy for reducing the incidence of exit-site infection in children undergoing long-term PD. However, the mechanism by which normal saline protects against exit-site infection remains unclear [5].

In the current issue of *Kidney Research and Clinical Practice*, Lee et al [6] compared the effectiveness of normal saline and povidone–iodine for chronic exit-site care in terms of reducing the incidence of exit-site infection and peritonitis in PD patients. They changed the exit-site care method gradually from povidone–iodine to normal saline in September 2007, and almost all patients were treated with saline by December 2007. In their study, they found that exit-site infection and peritonitis were not significantly associated with the methods of dressing, but the incidences of adverse effects such as skin irritation and itching were significantly lower in patients
treated with normal saline than in those treated with povidone–iodine. However, they also did not explain the effectiveness of normal saline in preventing exit-site infection. On the basis of the results of the current study, it may be difficult to conclude that normal saline was a safer and more effective topical antiseptic than povidone–iodine. This study had some limitations such as the retrospective analysis, a small number of patients, exclusion of recurrent events of exit-site infection, and uncontrolled prophylactic antibiotics, including the topical application of mupirocin or gentamicin. The incidence of events may have been under-reported. Furthermore, from September 2007 to December 2007, the exit-site care method was changed from povidone–iodine to normal saline. During this period, it is unclear which disinfectant was associated with catheter-related infections.

In the literature, the mechanism by which normal saline protected against exit-site infection is unclear. Mechanical removal of resident bacteria and debris from an uninfected exit-site using a cleansing swab, regardless of povidone–iodine or normal saline content, may be enough to promote healthy re-epithelialization at the exit-site. However, the application of povidone–iodine may resolve signs of inflammation. Preventing mechanical injury in the re-epithelialized exit site is the most important strategy to maintain a healthy exit site, regardless of the use of povidone–iodine or normal saline as topical applicants. Besides catheter immobilization, avoiding irritation-inducing antiseptics such as povidone–iodine during the break-in period is important to maintain a healthy exit site during long-term PD. The European best practice guidelines emphasize that povidone–iodine preparations and hydrogen peroxide should be avoided due to epithelial toxicity, especially during the early healing phase immediately after catheter implantation [7]. Amuchina may be considered an alternative antiseptic for the first postimplantation care of the exit site.

In conclusion, the work of Lee et al [6] compared the usefulness of normal saline for uninfected exit-site care with that of povidone–iodine. No significant differences in the incidences of exit-site infection and peritonitis were observed between the two methods of dressing, but the incidences of adverse effects such as skin irritation and itching were lower in the normal saline group than in the povidone–iodine group. Therefore, normal saline may be an alternative treatment method for exit-site care in PD patients, especially in children. Two options are available for stable exit-site care in PD patients. First, povidone–iodine can be used for exit-site care as a routine method, unless allergic dermatitis develops. Normal saline can be used as a substitute in case a povidone–iodine-induced skin reaction occurs. Symptoms usually subside within 1 week after the initiation of daily topical application of normal saline solution. Alternatively, dressing with normal saline can be applied with routine exit-site care without signs of infection. If an exit-site infection is suspected, the method of dressing should be changed temporarily from normal saline to povidone–iodine until the signs of infection are eliminated. Topical application of normal saline could be an alternative method of prophylactic exit-site care for long-term PD patients who have uninfected, stabilized exit-sites but allergic skin reactions.

Conflict of interest

The author declares no conflict of interest for this manuscript.

References


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