

Preliminary analysis of U-Drain experience in peritoneal dialysis population at Salford Royal

Introduction

Peritoneal dialysis allows patients to undertake their treatment for kidney failure in their own home. This allows a greater degree of autonomy and flexibility compared to haemodialysis and avoids three times weekly trips to a dialysis unit. Both locally and nationally home dialysis therapies are regarded as a priority, with clinical, financial and ecological benefits to patients and greater society.

U-Drain is a fixed drainage mechanism for patients on night-time Automated Peritoneal Dialysis (APD). In APD a small bedside machine circulates fluid into the subject's peritoneal cavity and the fluid, once drained out, removes fluid and waste products that the failing kidneys cannot cope with.

The treatment lasts 6-8 hours and generates a quantity of waste fluid that must be disposed of into toilet/drain. This can be more than 12 litres contained in 1-2 drainage bags.

U-Drain allows this fluid to be directly fed into the household draining system avoiding handling and carrying the fluid and the need for disposable waste bags.

The used consumables are plastic and non-recyclable and patients often require additional waste rubbish bin collections by the council.

Following use the U-Drain connector is flushed and cleaned by the patient or carer using supplied products.

This pilot project was supported by Greater Manchester Academic Health Sciences Network allowing 15 patients to be recruited to U-Drain installation their homes. Analysis was planned by patient and staff questionnaires, and patient characteristics and dialysis related complications.

Data collection

All patients were offered the opportunity to complete a questionnaire on their U-Drain experience. This comprised of 14 themes with specific questions regarding installation, tolerability, advantages and disadvantages and issues arising. It utilised a 5 point scale from "very satisfied" or equivalent to "very dissatisfied" and free text space was available for comments. It was completed on paper and anonymously entered into Survey Monkey (San Mateo, CA) questionnaire software for analysis.

Issues anticipated were patient satisfaction of installation and daily use of the system, advantages of not handling the waste fluid, and potential dialysis complications particularly peritonitis. Numerical values are presented as median (range) unless otherwise specified.

Patient characteristics

15 patients were recruited, 7 female, aged 57 (34-84) years. Predominant causes of kidney failure were diabetes (6), glomerulonephritis (3) and hypertension (3). There was variation in weight 71 (48-101) kg and body mass index (BMI) 26 (20-39) kg/m². 4 patients were active on the kidney transplant waiting list.

Patients were established on U-Drain at start of dialysis or having already commenced APD 1 (0-20) months. The Peritoneal Dialysis Dependency Score, a validated measurement of global patient performance is regularly undertaken on all local PD patients. The mean of last 5 scores measured on nursing home visits indicated a range of patient wellbeing and independence 6 (2-13). 1 patient were on Assisted APD, where a healthcare professional visits each day of dialysis to clear the waste fluids and disposable dialysis equipment and set up the machine with fresh fluid and consumables.

Outcomes

This preliminary analysis was undertaken at the end of June 2017 and contains data on up to 6 months U-Drain experience 4 (1-6) months, giving 64 patient-months exposure.

There were no reported failures of the U-Drain, disconnections from the drainage portal or leaks.

There were 3 episodes of peritoneal dialysis peritonitis (infection in the peritoneal cavity of the abdomen). 2 were relapsing Coagulase Negative Staphylococcus, 1 Staphylococcus Aureus. These are generally organisms associated with contamination of the PD circuit at time of connection to the permanent catheter in the peritoneal cavity. Peritonitis rate is calculated as 1 episode per 21 patient months. This is better than the UK Renal Association minimum standard of 1 per 18 patient months. There was no suspicion on analysis of the cases of U_Drain contributing to the infection.

One patient transferred from APD to manual continuous ambulatory peritoneal dialysis (CAPD) through personal preference and no longer required U-Drain.

Patient reported outcome measures

The patient questionnaire was completed by 13/15 participants.

100% were very satisfied with the installation, 73% very happy with the look and position 23% happy.

Distances reported to the bathroom or toilet where fluid was usually disposed of ranged from the adjacent room to 17m.

A family member 55%, carer 10%, healthcare assistant 10% and patient themselves 25% would normally carry the full drainage bags for disposal. Patients reported their difficulties in lifting full drain bags without assistance.

90% of patients felt the system saved them time in clearing the machine after dialysis ranging from 5-15 minutes, similarly 90% noted a reduction in set-up time. It was noted that cleaning the U-Drain outlet did offset some of the time gained in clearing up.

80% noted a reduction in storage space required for consumables and 100% noted a reduction in non-recyclable waste requiring disposal.

Flushing after use was extremely easy for 55%, easy for 35% and slightly difficult for 10%.

Overall 80% felt the system had been extremely beneficial to them, 20% beneficial.

Important feedback was given on potential improvements, particularly in the clean/flush procedure. This has been fed-back to the suppliers.

100% of patients would recommend U-Drain to another person on dialysis: “makes life a lot easier”, “definitely beneficial”, “much more convenient than using large drain bags”, “it saved a lot of time and you don’t struggle with heavy drain bags”.

Green dividend

During the period of this review 3700 drainage bags were saved from use, reducing the weight of non-disposable plastic sent for landfill by approximately 650kg.

Staff questionnaire outcomes

9 staff members participated 45% registered nurses, 55% healthcare assistants providing Assisted APD and normally disposing of the full drain bags, setting up and priming the dialysis machine.

Staff perception of patient benefit was 85% very satisfied and 15% satisfied with U-Drain, noting benefit in set up including elderly patients and those with arthritis. 85% felt their role was much easier with the system, 15% easier, with quicker consultations, less mess and fluid exposure in disposal. Areas for improvement again centred round the flush/cleaning procedure.

100% noted a time saving in their role from 5-20 minutes per visit and all found benefit in not carrying the full drainage bags around a patient’s house.

100% felt they could recommend the system to other patients.

Conclusion

Patients and staff involved with this pilot project feel it has been very successful. It is widely recognised that patients undertaking their dialysis at home can suffer fatigue in delivering the treatment usually daily. The increasingly frail and elderly population and those with significant multi-morbidities can be put off, or indeed fail home therapy because of the prospect of large bags of waste fluid accumulating by the bedside at night and the need to dispose of them in the morning. In a representative population of peritoneal dialysis patients, the U-Drain system was universally popular and had immediate benefits to patient and carer wellbeing.

The system was well thought of by staff members and no medical complications have been observed related to the system. It was noteworthy that 100% of patient and staff respondents would recommend the system to other patients.

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The author has no conflict of interest